# Vibration Management Plan - Correnso/Slevin/MDDP

## WAI-200-PLN-002

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| **Site:** | Waihi |

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| | **Document Name** | **Document Reference** |
|---|---|---|
| **Reference Documents** | Vibration Management Plan - Correnso | WAI-200-PLN-002 |
| | Vibration Management Plan – Correnso/Slevin | WAI-200-PLN-002 |
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# OCEANAGOLD WAIHI

# VIBRATION MANAGEMENT PLAN - CORRENSO/SLEVIN/MDDP

# JULY 2017

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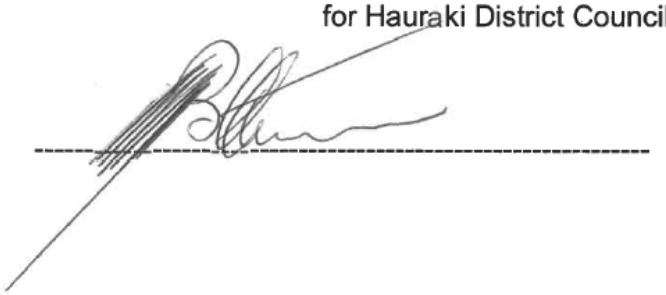

# Document Issuance and Revision History

**Document Name:** **Vibration Management Plan - Correnso/Slevin**

**Document Reference:** **WAI-200-PLN-002**

| Revision No. | Revision Date | Section | Page | Description of Issuance or Revision | Effective Date |
|---|---|---|---|---|---|
| 1 | Dec 2013 | | | Initial Plan | Dec 2013 |
| 2 | Nov 2016 | | | Incorporation of Slevin (SUPA) into Plan | Nov 2016 |
| 3 | Jul 2017 | | | Incorporation of MDDP into Plan | Jul 2017 |
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# Table of Contents


**1. PLAN OBJECTIVE 5**

**2. BACKGROUND 5**

2.1. Correnso ..... 5
2.2. Slevin ..... 5
2.3. MDDP ..... 5

**3. LEGAL REQUIREMENTS 6**

**4. BLASTING TIMES AND VIBRATION LIMITS 7**

**5. BLAST EVENT DURATION 8**

**6. BLAST NOTIFICATION 9**

6.1. Web-Site ..... 9
6.1.1. Monthly 9
6.1.2. Daily 9

**7. MANAGEMENT OF EFFECTS 9**

7.1. Mine Planning and Mining Methods ..... 9
7.2. Blast Design ..... 10
7.2.1. Introduction 10
7.2.2. Blast Design Procedures 10
7.2.3. Blasting Protocols 11

**8. MONITORING 12**

8.1. Structural Condition Surveys ..... 12
8.2. Blasthub ..... 12
8.3. Compliance Determination ..... 15
8.3.1. Overview 15
8.3.2. Scaled Distance 15
8.3.3. Assigning Blasts to Monitored Vibration Results 15
8.3.4. 95% Compliance 16
8.3.5. Averaging Procedure 16
8.4. Roving Monitor ..... 17
8.4.1. Roving Monitor Procedure 17
8.4.2. Monitoring within Structures 18
8.5. Geophones ..... 18
8.6. Geophone & Microphone (Sound) Calibration ..... 18

**9. MITIGATION 19**

9.1. Mitigation Actions ..... 19

**10. REPORTING 20**

**11. COMMUNITY LIAISON 20**

11.1. Amenity Effect Programme ..... 21

**12. COMPLAINT RESPONSE 21**

**13. TRAINING 21**

**14. VIBRATION MANAGEMENT PLAN REVIEW 22**

**15. REFERENCES 22**

**APPENDIX A – VIBRATION CONDITIONS HDC LAND USE CONSENT NO. 202.2012 (CORRENSO) 23**

**APPENDIX B – VIBRATION CONDITIONS HDC LAND USE CONSENT LUSE-202.2016.544.001 (SUPA) 30**

**APPENDIX C – VIBRATION CONDITIONS HDC LAND USE CONSENT LUC RC-664.001.2017 (MDDP) 38**

**APPENDIX D – OGNZL SOP WAI-800-PRO-007 MANAGING PUBLIC COMPLAINTS 45**

# 1. PLAN OBJECTIVE

The objectives of this Vibration Management Plan (VMP) are to detail the methods to be used by OceanaGold New Zealand Ltd - Waihi (OGNZL) to:

- comply with the relevant conditions of the Hauraki District Council (HDC) Land Use Consents (LUC) 202.2012 (Correnso Underground Mine project), LUC LUSE-202.2016.544.001 (Slevin Underground Project Area), and LUSE-202.2017.664.001 (Martha Drill Drives Project (MDDP));
- avoid or mitigate unreasonable blasting vibration effects as required by s17 of the Resource Management Act; and
- liaise with the HDC and the Waihi community, and respond to complaints and concerns as they arise.

**NOTE:**

*OGNZL has prepared and operates under an existing VMP for its current Martha, Favona and Trio mines (approved under Mining Licence 32-2388, the HDC Land Use Consents 97/98 - 105 (for the Martha Mine), 85.050.326E (Favona Underground Mine), and RC-15774 (Trio Underground Mine)). To avoid confusion that may arise by discussing the management of the other mines, the Correnso/Slevin/MDDP VMP is submitted as a stand-alone plan to meet the requirements of the Correnso, Slevin and MDDP LUCs only. If appropriate or necessary, future revisions may be amalgamated into a single VMP covering all of the Waihi operations.*

# 2. BACKGROUND

## 2.1. Correnso

The Correnso Underground Mine (Correnso) is located within the Correnso Extensions Project Area (CEPA) under residential land in the eastern part of the Waihi township. The required consents to undertake the project were granted by the Waikato Regional Council (WRC) in December 2012, and the HDC LUC was granted on 18 October 2013.

The first year of operation in Correnso involved development blasting to construct access and orebody drives; stope production blasting began in June 2015. Additional development has been undertaken into the identified extensions (Empire, Daybreak, and Christina) and dewatering is underway to enable further development at depth.

The Correnso LUC includes specific conditions that set limits on the permissible vibration level, times and durations of blasts, and the numbers of blast events per day to protect the amenity of the residents.

## 2.2. Slevin

The Slevin Underground Mine is a development between the Correnso Extensions Project Area (CEPA), SW of Correnso, and the Martha Pit. The required consents from WRC were in place from the CEPA application and the HDC LUC was granted in late October 2016. Development drives into Slevin have extended from Correnso's Daybreak extension and stope production is scheduled for late 2017.

The Slevin LUC conditions in relation to blast vibration are sufficiently similar to Correnso in terms of permissible vibration level, times and durations of blasts, and the numbers of blast events per day to:

a) protect the amenity of the residents, and
b) enable the two operations to operate under the same monitoring mechanisms and management plan.

## 2.3. MDDP

The Martha Drill Drive Project (MDDP) is to install two exploration drives from the western end of the Slevin development, extending under the southern wall of the Martha pit, to enable exploration under and to the south of the pit (see Figure 1).

Like the Slevin project, the MDDP LUC conditions in relation to blast vibration are sufficiently similar to those of the other two LUCs to enable the three operations to operate under broadly the same monitoring mechanisms and management plan.

## 3. LEGAL REQUIREMENTS

The full conditions relating to blasting in the Correnso, Slevin and MDDP LUCs are included as Appendix A, B, and C respectively. In summary, these conditions require OGNZL to comply with the following (note: MDDP differs in having no production blasts):

- No more than three blast events per day, Monday to Saturday, between 0700 and 2000 (LUC Correnso 14(a), Slevin 8(a), MDDP 13(a));
- No blasting at night (2000 to 0700 the following day), on Sundays or public holidays (LUC Correnso 14(b), Slevin 8(b), MDDP 13(b)):
- Conditions relating to permitted vibration levels, with 95% and average specifications calculated independently for development and production blast types (LUC Correnso 14(c-f) & 17, Slevin 8(c-f) MDDP 13(c-f));
- Duration limits on production and development blasts (LUC Correnso 14(g-i), Slevin 8(g-i), MDDP 13(g-i));
- 'Best endeavour measures' to minimise blasting impacts on the community (LUC Correnso 15(a) , Slevin 9(a), MDDP 14(a));
- Implementation of an Amenity Effect Programme (AEP) (LUC Correnso 15(b-i), Slevin 9(b-i), MDDP 14(b-i));
- Simultaneous blasts within the Trio, Favona or Martha Mine must meet the Correnso/Slevin/MDDP vibration limits (LUC Correnso 16, Slevin 10, MDDP 15);
- No blasting for the ventilation shaft construction (LUC Correnso 18);
- a Vibration Management Plan to be submitted to HDC prior to commencement of mining (LUC Correnso 19, Slevin 11, MDDP 19));
- Impulsive vibration from all blast events to be monitored (LUC Correnso 20(a), Slevin 12(a), MDDP 16(a));
- Monitoring system to be automated to allow for prompt analysis (LUC Correnso 20(b), Slevin 12(b), MDDP 16(b));
- Monitoring to be conducted by suitably trained personnel, using equipment compliant with current AS/NZ standards (LUC Correnso 20(c), Slevin 12(c), MDDP 16(c));
- The establishment of and criteria for fixed monitoring locations (LUC Correnso 20(d-e), Slevin 12(d-e), MDDP 16(d-e));
- A roving monitor to record vibrations at complainant locations and determine the need for additional fixed monitor installations (LUC Correnso 20(f-g), Slevin 12(f-g), MDDP 16(f-g));
- Complete records to be kept of each blast event (LUC Correnso 20(h), Slevin 12(h), MDDP 16(h));
- Structural condition surveys to be completed on selected properties prior to blasting commencing (LUC Correnso 21(a));
- Protocols for responding to complaints of property damage (LUC Correnso 21(b), Slevin 13, MDDP 17);
- Maintaining a website which will present a monthly mining plan and a log of results from the latest ten blast events (LUC Correnso 22(a & e), Slevin 14(a & e), MDDP 18(a & e));
- No blasting without the written approval of the Mine Manager (LUC Correnso 22(b), Slevin 14(b), MDDP 18(b));
- Reporting and mitigating actions required in the event of vibration standards being exceeded (LUC Correnso 22(c-d), Slevin 14(c-d), MDDP 18(c-d));

- Provision of a three-monthly summary report to HDC (LUC Correnso 22(f), Slevin 14(f), MDDP 18(f));
- Systematic storage of records reports and complaints (LUC Correnso 22(g), Slevin 14(g), MDDP 18(g));
- Monitoring of Union Hill Heritage Items if modelling indicates vibration levels of 5mm/s within 20m (LUC Correnso 66).

## 4. BLASTING TIMES AND VIBRATION LIMITS

The compliance limits are largely contained in Correnso LUC c14, Slevin LUC c8 and MDDP c13. In summary, they require:

| | |
|---|---|
| Available blasting periods | Monday to Saturday, between 0700 and 2000<br>No blasting at night (2000 to 0700 the following day), on Sundays or on public holidays |
| Maximum number of blast events per day | 3 |
| Peak Particle Velocity (vector sum) limit | For development blasts:<br>• 5mm/s for 95% of monitored events<br>• 2mm/s on average at each approved monitor (six month rolling period)<br><br>For production blasts (*excluding MDDP, which has no production blasting*):<br>• 5mm/s for 95% of monitored events<br>• 3mm/s on average at each approved monitor (six month rolling period) |

*Definitions:*

- *A Blast Event is defined as an individual blast or number of linked individual blasts.*
- *A Development Blast is an event containing only development blasts. A development blast is defined as any blast having a maximum instantaneous charge weight per hole of no more than 7 kilograms of explosive.*
- *A Production Blast is defined as any blast in which a single hole contains a maximum instantaneous charge weight of more than 7 kilograms of explosive. Slot blasts are deemed to be production blasts.*

Predictability of blasting times is recognised as a means of reducing and mitigating blast vibration effects and therefore it is of benefit to the community for OGNZL to restrict its three underground blasting events to regular blast windows where practicable.

Although blasting is permitted to occur up to three times at any time between 7am and 8pm, Monday to Saturday, OGNZL will use best endeavours to fire;

- Blasts between 7am and 8am, 1pm and 2pm, and 7pm and 8pm (the shift changes and meal breaks); and
- Production blasts during the 1-2pm meal break, when residents are more likely to be at work or busy at home.

In recognition of its obligation to minimise blast effects, OGNZL will endeavour to keep each firing close to a set time each day and within each window to the extent practicable.

In setting the above timing targets, it must be recognised that underground mining is a complex undertaking, and that many factors can influence OGNZL's ability to have prepared each blast ready to fire at set times each available day.

So while OGNZL will use its best endeavours to achieve consistent firing times whenever it can (including firing close to a set time within each window), for production and safety reasons there may be infrequent times when blasting must occur outside the three targeted one-hour windows outlined above, but not at night (2000 hrs to 0700 hrs).

Compliance with the 95-percentile limit shall be determined:

- separately for development blast and for production blast,
- based on the highest recorded vibration for each blast event measured at any monitor,
- where the blast type is assigned on a monitor-by-monitor basis according to the blast with the minimum scaled distance from each monitor, and
- based on a six-month rolling average (for the initial 100 blasts of each type, compliance will be no more than one exceedance of 5mm/s in every 20 consecutive blast events).
- Compliance with the average limit shall be determined:
- separately for development blast events and for production blast events,
- determined separately for each blast monitor based on the total number of blast events in a six-month rolling period,
- where the blast type is assigned on a monitor-by-monitor basis according to the blast with the minimum scaled distance from each monitor, and
- only once the initial 100 blasts of each type have been fired.

## 5. BLAST EVENT DURATION

Blast duration is recognised as a factor that influences human response to vibration; the longer the duration, the greater the effect.

Consent Conditions (Correnso 14(g), Slevin 8(g)) place limitations on the duration of blasts, with different durations depending on the type of blasts (or combination thereof) such that 95% of:

- production blasts (not blast event) shall have a total duration of no more than 9 seconds;
- development blasts shall have a total duration of no more than 12 seconds
- a combination of production and development blasts shall have a duration of not more than 12 seconds; and
- Consent Conditions (Correnso 14(h), Slevin 8(h), MDDP 13(g)) also place limitations on the duration of blasts events (18 seconds, 18 seconds, and 12 seconds respectively).

*Note that the 9 seconds duration for production blasts referred to in the conditions is a nominal time and corresponds with the maximum delay used in production blasting (8,050 milliseconds).*

In addition to meeting consented duration limits, OGNZL will use best endeavours to maintain the impacts of blasting vibration duration to the practicable minimum. In particular, OGNZL will endeavour to:

- Initiate all blasts within each blast event at the same time. The simultaneous initiation of blasts within a single event required to meet the targets and minimise blast event duration is desirable from operational, safety and blast duration perspectives.
- Minimise the duration of all production blasts (not blast events) to less than the nominal maximum delay of 8,050 milliseconds.
- Restrict the duration of all blast events to the minimum consistent with safe and efficient mining operations.

By achieving the above targets, the maximum blast event duration should often be no more than about 10 seconds.

# 6. BLAST NOTIFICATION

Prior and timely notification of an impending blast event can reduce the vibration effect for some people. In addition to advertising daily planned blasts on its web-site, OGNZL has to date implemented a daily manual process of advising residents of impending blasts, via email, txt, or phone. OGNZL has also implemented an automated Blast Notification System, comprising receiver units that will be supplied to any property owner/occupier within the Correnso/Slevin area upon request. The shot firer shall use the system to signal the impending production blast event prior to initiating the blast; initially one minute. The delay between the notification signal and the firing of the shot may be adjusted from time to time, based on community feedback, to give the optimal warning time.

While the automated Blast Notification System is the preferred method, there may be special circumstances where it is appropriate to retain one or other of the original notification methods.

## 6.1. Web-Site

OGNZL will continue to provide blasting advice on its web-site (www.waihigold.co.nz/blast-times/) for its current operations. This will include all underground operations, and provide the following:

### 6.1.1. *Monthly*

At the start of each month, a plan showing the areas to be mined (and hence blasted) during that month shall be prepared and loaded onto the site. The downloadable pdf version of the plan shall also be available and hard copies made available to the Waihi Information Centre & HDC Waihi Service Centre.

While OGNZL will use its best endeavours to restrict its blasting to the work areas defined on the plan, it is recognised that operational constraints must dictate and may lead to deviations from the plan during the course of the month.

### 6.1.2. *Daily*

Each morning, the intended times for production blast events for that day will be provided.

As soon as practicable following each blast event, the vibration magnitude recorded at each of the vibration compliance monitors will be presented on the web-site. The site will keep a running display of the last ten blast events. It needs to be recognised that to get the results onto the site quickly will require automation; these results will remain provisional until verified manually.

# 7. MANAGEMENT OF EFFECTS

## 7.1. Mine Planning and Mining Methods

The size of blast and hence the management of blasting effects starts with appropriate mine planning and design.

Management of blast vibration therefore needs to be a critical consideration in all areas of mine design and planning. For example, the selection of the sub-level spacing determines the length of blast holes and hence the charge weight that can be effectively applied when production blasting. All aspects of mine planning and design will be appropriately applied to achieve a balance between productivity, cost-effectiveness and vibration minimisation.

Mine planning typically requires the use of Overhand Cut and Fill mining methods in the upper levels of the orebody. Cut and fill mining is not a particularly cost-efficient or productive mining method, however it may be necessary in the upper levels to minimise vibration at the surface. Once there is sufficient separation between the surface and the areas being mined, mining can revert to more productive methods, e.g. modified Avoca or transverse stoping.

## 7.2. Blast Design

### 7.2.1. *Introduction*

Construction to the approved mine plan determines the maximum length of blasthole for the production blasts, which are the blasts more likely to generate elevated vibration levels. The parameters then available for adjusting blast design are;

- The blasthole diameter;
- The explosive density; and
- The uncharged length of blasthole (stemmed length).

These parameters need to be selected to ensure blasting results in sufficient fragmentation of the blasted rock while achieving consent compliance and minimising vibration effects. Blasting at Favona since early 2005 and at Trio since late 2010, supplemented by blasting to date within the Correnso orebody has provided an excellent base of experience for future blast design and vibration management for Correnso, Slevin and MDDP.

The vibration data from these projects have been analysed using techniques consistent with the recommendations provided in the Australian Standard AS2187 and/or other accepted methods of analyses. The equation typically used to predict the level of vibration at Waihi for a given explosive quantity and distance has the following form (Equation 1):

$$PPV = K \times \left(\frac{d}{\sqrt{w}}\right)^{\beta}$$

where:

PPV = peak particle velocity (vector sum), expressed in mm/s;

K = an attenuation constant;

d = the distance between the blast and the monitor, expressed in m;

w = the MIC, in kilograms;

$\beta$ = a constant, which for Waihi has been determined as -1.49; and

$d/\sqrt{w}$ = the scaled distance term

As with OGNZL's other underground projects, the version of the above equation needs to achieve a "95% design" objective. For the default blast design for Correnso and Slevin, the 95% design relationship is;

$$PPV_{Underground\ Design} = 2230\left(\frac{d}{\sqrt{w}}\right)^{-1.49}$$

### 7.2.2. *Blast Design Procedures*

In practice, the application of statistics and in particular the design of a blast via a given vibration relationship such as outlined above does not need to and will not occur for every blast. The practice used throughout Correnso (and to be used in Slevin) is to;

1. Adopt the above equation as the starting point for the initial access drive development blasts, but to err on the side of conservatism in charging the blast-holes until there are sufficient data to confirm or refine this relationship.
2. Apply the previous blast design once it is demonstrated to achieve compliance with the consent conditions and the objectives of this Plan, with adjustments where the previous recorded vibrations dictate.
3. Undertake statistical analyses using the access drive development blast data to update the above relationship for designing the first long-hole production blast(s).
4. Adopt a conservative charge weight, i.e. less than indicated as applicable by the adjusted 95% design relationship, for the initial long-hole production blasts until there are sufficient data to confirm or refine this relationship.

5. Apply the maximum calculated charge weight to the blast designs once it is demonstrated to achieve compliance with the consent conditions and the objectives of this Plan, with adjustments where the previous recorded vibrations dictate.
6. Repeat steps 3 to 5 when blasting moves to a new area within the mine, or in areas where difficulties have already been experienced.
7. In instances where compliance has proven to be difficult to achieve, the design shall be interrogated further to include detailed analyses based on the available data from previous blasting specific to, or near, that location.

All blasts are designed by Production Engineers and are reviewed and approved by a Senior Technical Services staff member. This review includes checks on the maximum instantaneous charge, timing and sequencing, and takes into account the results of previous firings in the same area.

OGNZL has also modified Blasthub to enable blast vibration history to be reviewed by level and location to inform subsequent blast designs. This process will continue throughout the life of projects.

The updated statistical analyses and revisions to the design relationship referred to in the steps above shall be undertaken by Heilig & Partners.

### 7.2.3. *Blasting Protocols*

Development and Cut & Fill Blasts

- Generally for development there are no more than 8 holes on any one delay.
- Typically, a charge weight per hole of no more than about 5kg will be used unless previous blasts have indicated a higher-than acceptable vibration. Where elevated vibration is experienced, the blast design will be reassessed as outlined above in s7.2.2.

Slot Blasts

- Slots will be blasted in lifts, with each lift being generally no more than around 5 metres, unless ground conditions or safety dictate otherwise.
- An MIC of around 18kg will be used in each lift.

Production Blasts

- As far as practicable, stopes are to be fired between 1.00 - 2.00pm.
- The MIC is selected based on the procedures outlined above in s7.2.2 to achieve an acceptably low level of vibration while maximising the efficiency of the blast. For about one third of the production blasts in the mid to upper levels of the orebody, a charge weight of less than 20kg per delay will be required, with a further one third of production blasts able to be fired with 20-30kg per delay. These reduced charge weights may be achieved by decking. At the bottom of the mine, the remaining productions blasts can be mined with a single column of explosives and an MIC of around 30kgs per delay.
- The delays chosen for production firings are dependent on the type of initiation system used. For cost considerations, it is preferred to use conventional non-electric detonators. OGNZL uses the MS series of Nonel det, numbers 1 to 36, which provides a maximum delay of 8,050 milliseconds. Where necessary, particularly where there is a need to control vibration magnitude and duration, OGNZL may use IKON electronic detonators, which can be programmed for between 1 millisecond out to 15,000 milliseconds (note that the conditions of consent limit the maximum delay to 8.050 milliseconds).
- The above routine protocols have come about after extensive modelling and trial blasting; there is a check process for each stope blast design. If there is a need to increase the size of patterns above and beyond standard practice, blast plans are sent to Heilig and Partners Pty Ltd for review.

Irrespective of blast type, OGNZL has procedures that utilise the blast design for management of the blasting process; from marking up a heading face, for drilling through to production charging, firing, and managing misfires.

# 8. MONITORING

## 8.1. Structural Condition Surveys

Correnso LUC Condition 21(a) required 15 representative properties to have structural condition surveys undertaken prior to Correnso-related blasting. In addition surveys were also carried out at Waihi East School and kindergarten, the former Mine Manager's house at 57 Barry Rd, and 'control' properties (approved by HDC) removed from blasting influences. There is no such requirement for Slevin or MDDP.

For the structural surveys, OGNZL utilised BRANZ as an independent, suitably qualified and experienced engineering firm. They have been undertaking surveys at Waihi for a number of years and understand the requirements relating to visual inspections and video records.

## 8.2. Blasthub

The Blasthub vibration monitoring system (VMS) has been utilised as the blast vibration monitoring system since 1 January 2005 (HDC approval reference 64.601.001 dated 8/3/05). The system provides real-time, web-based monitoring that is accessible to both HDC and OGNZL and includes automatic email notification of blast events that trigger two or more monitors. The VMS will continue in operation throughout the life of Correnso, Slevin and MDDP.

Results from blast monitoring are automatically loaded onto Blasthub from the vibration monitoring network (Figure 2), along with manual loading of details of the blast design and plan. Heilig and Partners Pty Ltd compares the corresponding plans/results and provides an external review, developing recommendations when necessary for on-going blasting plans and procedures to ensure compliance (with a safety margin).

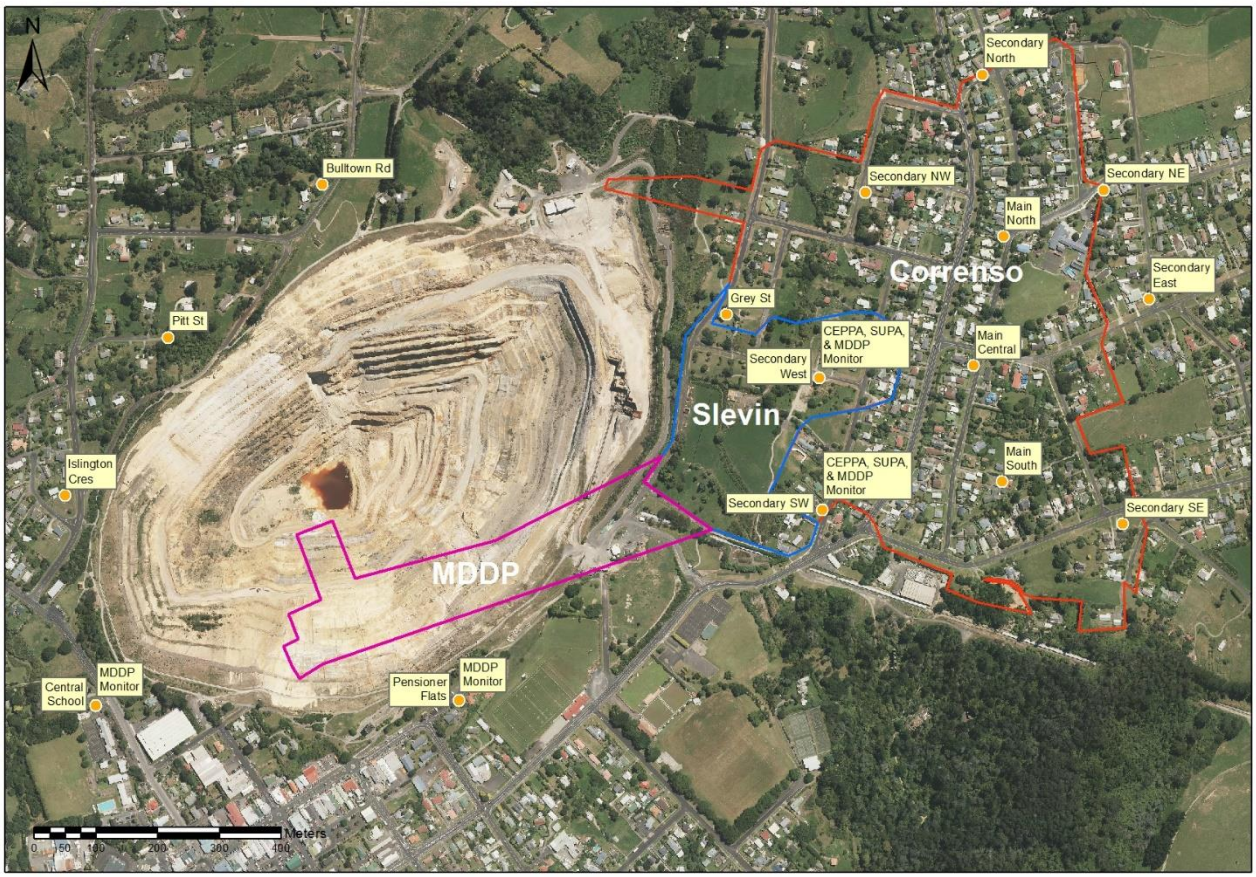



**Figure 1 – Consent Boundaries and Vibration Monitors**

Results are accessible for review on an internet web-site (http://newmont-waihi.blasthub.com). Access to the web-site is controlled by the OGNZL HSEC Manager with permission for review provided to HDC staff and OGNZL users. A schematic of the VMS is shown in Figure 2.

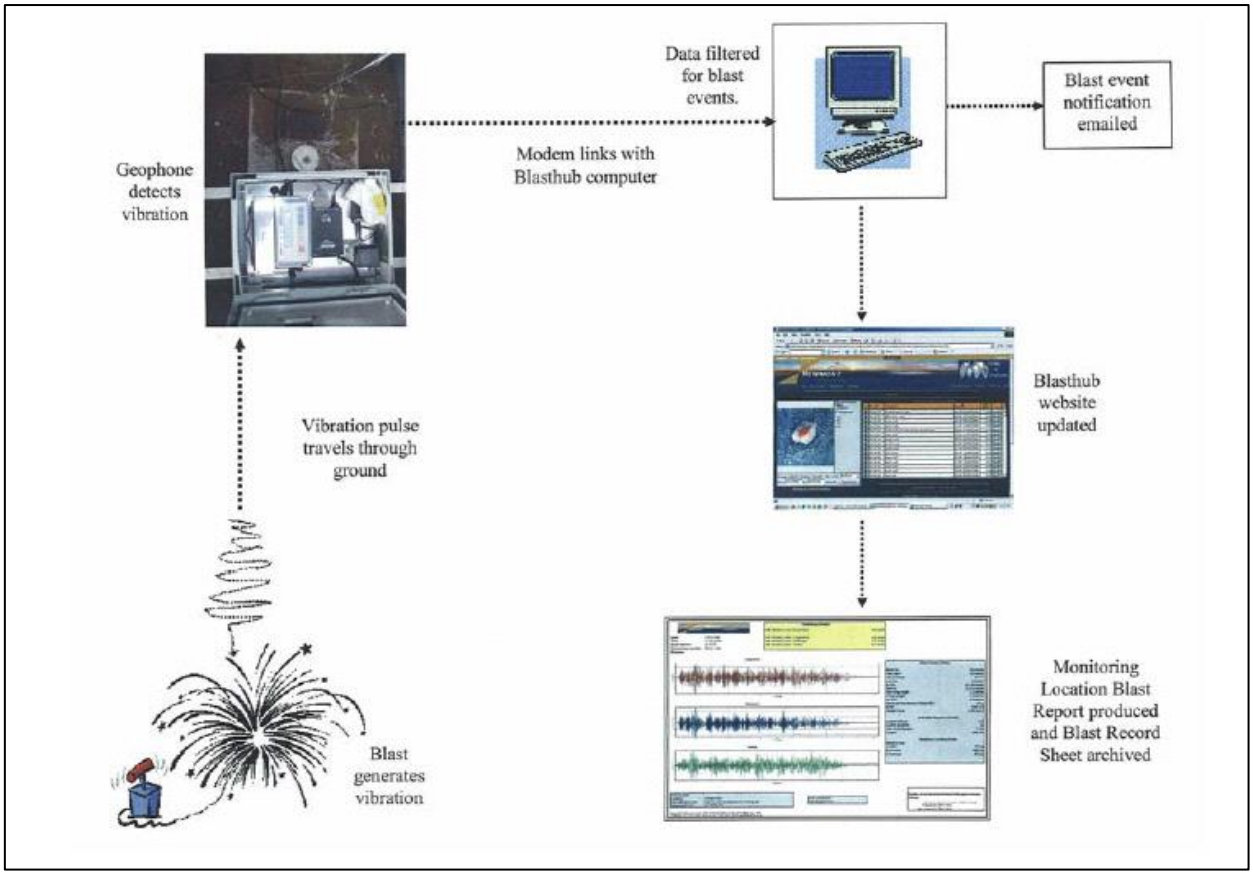



**Figure 1 – Schematic of Blasthub Vibration Monitoring System**

Each vibration monitor has four recording channels. An external geophone (transducer) monitors vibration in three directions (Transverse, Vertical & Longitudinal particle velocities). Ground vibrations generated by a blast are detected by the geophone generating a variable voltage trace. From this data a Peak Particle Velocity (PPV) is generated.

The fixed monitors have pre-set recording period and vibration trigger levels (see Table 1). After recording an event a monitor will automatically dial the Blasthub computer to download the data. In addition each monitor has a “dial home” schedule for administrative checks. Downloaded data is filtered by Heilig & Partners Pty. Ltd. to classify blast events from erroneous events (activities such as vehicular, livestock, seismic, etc.). Blast Location Monitoring Reports (summarising results & displaying vibration traces) are generated and incorporated into the Blasthub database.

**Table 1 – VMS Monitor Configurations**

| Location | Address | Monitor Co-ordinates | Recording Period | Threshold | Operating Schedule |
|---|---|---|---|---|---|
| Main South | Gladstone Sth | N: 643094.1<br>E: 396545.8<br>RL: 1117.9 | 18 seconds | 0.75mm/s | Continuous |
| Main Central | Gladstone Central | N: 643330.6<br>E: 396483.9<br>RL: 1119.8 | 18 seconds | 0.75mm/s | Continuous |
| Main North | Gladstone Nth | N: 643502.4<br>E: 396537.4<br>RL: 1121.3 | 18 seconds | 0.75mm/s | Continuous |
| Secondary SW | Roycroft St | N: 643050.8<br>E: 396249.7<br>RL: 1113.5 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Secondary West | Slevin St | N: 643262.5<br>E: 396246.0<br>RL: 1115.5 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Secondary NW | Buller St | N: 643563.8<br>E: 396321.8<br>RL: 1119.2 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Secondary North | Gladstone/ Somerset | N: 643756.3<br>E: 396510.6<br>RL: 1121.4 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Secondary NE | Donnelly St | N: 643572.4<br>E: 396708.0<br>RL: 1120.4 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Secondary East | Smith St | N: 643388.8<br>E: 396781.2<br>RL: 1120.4 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Secondary SE | Barry Rd | N: 643022.5<br>E: 396739.8<br>RL: 1117.4 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Central School | Moresby Ave | N: 642730.8<br>E: 395075.1<br>RL: 1116.9 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| Pensioner Flats | Seddon St | N: 642740.4<br>E: 395661.7<br>RL: 1119.4 | 18 seconds | 0.75mm/s | 06:30 – 20:30 |
| 3rd MDDP monitor | to be confirmed | N:<br>E:<br>RL: | 18 seconds | 0.75mm/s | 06:30 – 20:30 |

*NB: The threshold and operating schedule may need to be varied (with HDC written approval) if extraneous vibration readings cause the monitors to fill and go into 'idle'.*

An MDDP LUC condition (c16(e)) requires the installation of an additional monitor located between the Pensioner Flats and Central School monitors. The consent does not specify the exact location of the monitor, but its location must be confirmed with Council and its installation complete within 4 months of consent commencement.

Provided the vibration level triggers the minimum number of units, the Blasthub system automatically sends a notification email to key HDC & OGNZL personnel. Blast records are linked to the relevant Blasthub records (along with complaint records if received).

## 8.3. Compliance Determination

### 8.3.1. *Overview*

LUC conditions (Correnso c14(c-d), c17, Slevin c8(c-d), and MDDP c13(c-d)) require that blast vibration compliance be assessed separately for development and production blasts against permissible maximum and average levels of vibration. A blast will be classed as either development or production on the basis of whether the maximum instantaneous explosive weight (MIC) is less than or greater than 7 kilograms respectively.

Calculating the average level of vibration for development and production blasting will occur within the Blasthub program and the results displayed on a compliance page within Blasthub where data specifically relating to the compliance statistics will be shown. The statistics page will show for each of the ten monitoring locations[1] the average level of vibration for both development and production based upon the six month rolling period (or for the first 100 blast events, whichever occurs later). The data will be displayed for each of the individual monitoring sites. The page will also display trend graphs for each monitoring site showing the variation in the average level of vibration with time.

Blasthub will differ from the pre-Correnso arrangement in that it will assign a vibration value for all production and development blasts, including blasts that are initiated simultaneously within a single blast event. The assigning of a specific blast to a recorded vibration will be based on the blast with the minimum scaled distance from each monitor.

Vibration levels for each blast will be assigned (where that blast has the minimum scaled distance) or back calculated using the K value for that blast/monitoring configuration. Only the single highest value for each blast type within a blast event will be used for calculating the average and 95% compliance statistics.

### 8.3.2. *Scaled Distance*

As described in Section 7.2.1 (blast design), the convention for estimating the magnitude of vibration is expressed by the following equation (Equation 1);

$$PPV = K \times \left(\frac{d}{\sqrt{w}}\right)^{\beta}$$

where:

PPV = peak particle velocity (vector sum), expressed in mm/s;

K = an attenuation constant;

d = the distance between the blast and the monitor, expressed in m;

w = the MIC, in kilograms;

$\beta$ = a constant, which for Waihi has been determined as -1.49; and

$d/\sqrt{w}$ = the scaled distance term

The scaled distance is therefore a term that encompasses the distance between the blast and the monitoring location divided by the square root of the MIC.

### 8.3.3. *Assigning Blasts to Monitored Vibration Results*

When multiple blasts are fired within a single blast event, the maximum vibration recorded at each monitor will be assumed to have been generated by the individual blast with the minimum scaled distance value, irrespective of the type of blast (development or production).

Once assigned to a recorded vibration level, the K value for the blast generating the maximum vibration is the only unknown but can be readily calculated by manipulating the above equation thus (Equation 2);

$$K = \frac{PPV}{\left(\frac{d}{\sqrt{w}}\right)^{\beta}}$$

The same approach is applied to blast events that contain only a single blast.

[1] Plus any additional sites that may be identified through the roving monitoring and agreed in writing by HDC.

### 8.3.4. *95% Compliance*

Compliance with the 95th percentile limit (Correnso c14(c-e), Slevin c8(c-e) and MDDP c13(c-e)) shall be based on the highest recorded vibration for each blast event measured at any monitor, i.e. after each blast event, a single vibration reading will be added to the historical readings, with that reading being the highest level obtained from the entire monitoring array. Separate records will be maintained for development blast events and production blast events, where the blast type is assigned on a monitor-by-monitor basis according to the blast with the minimum scaled distance from each monitor.

The reported percentile level for each type of blast event will be derived over a rolling period of 6 months. Correnso LUC condition 17 required that no more than one in 20 consecutive blast events may exceed 5mm/s for the initial 100 events; thereafter, compliance will be reported as a percentage. 100 events of each type of blast event have now occurred in Correnso and compliance for Correnso, Slevin and MDDP will be reported as a percentage.

### 8.3.5. *Averaging Procedure*

The algorithm (agreed between HDC and OGNZL) for calculating the average vibration value will be coded into Blasthub and unable to be altered without the agreement of HDC and OGNZL. The algorithm will calculate the average level of vibration according to the following definitions:

a) A blast event may comprise only development blasts or production blasts, or a combination of both types, initiated simultaneously;

b) Each blast within a blast event will be classed as either development or production depending on its MIC;

c) For calculation of average PPV levels, independent average levels will be calculated for development and production blasts;

d) For calculation of average PPV levels, independent average levels will be calculated at each permanent vibration monitor;

e) After each blast event, and at each permanent monitor location, a single PPV level will be added to either the development or production database to update the average PPV value, and the only exception to this will be when a blast event contains both development and production blast types, in which case a single PPV will be added to each of the development and production blast databases. The second level will be calculated using the same K value derived from the dominant blast type which was estimated to have produced the measured PPV, based on the blast type with the minimum scaled distance to the monitor. The level assigned to each blast-type database will represent the highest vibration level recorded from all of the blasts of that type fired in that event. The following examples are provided:

   i. Where a blast event contains multiple development blasts, and no production blast, Blasthub will identify the blast with the minimum scaled distance, and the PPV for the entire event will be assigned to that particular development blast. The development blast vibration database, and the average PPV for development blasting will be automatically updated by the addition of one new value, being the PPV as measured at that monitor location.

   ii. Where a blast event contains multiple production blasts, and no development blast, Blasthub will identify the blast with the minimum scaled distance, and the PPV for the entire event will be assigned to that particular production blast. The production blast vibration database and the average PPV for production blasting will be automatically updated by the addition of one new value, being the PPV as measured at that monitor location.

   iii. Where a blast contains a mix of both production and development blasts, Blasthub will identify the blast with the minimum scaled distance, and determine whether it is a production or development blast by reference to supporting documentation. The procedure described in a) or b) above will then be followed for that blast type. In addition, Blasthub will calculate the appropriate K value for that blast, and apply that K value to estimate the highest PPV for the other blast type with the minimum scaled distance (considering only the blasts of the second blast type). The single estimated PPV for the second blast type will also be added to the vibration database for that blast type.

f) Where a permanent monitor fails to trigger, that monitor will be assigned a PPV equal to two thirds of the threshold trigger level, which will nominally be set to 0.75 mm/s. The assumed PPV will be assigned to the blast type with the minimum scaled distance, and, if necessary, a PPV will be back-calculated for the other blast type using the method described above. The trigger threshold level at each monitor will be set as low as possible to avoid bias in assumed PPV levels, but will also be set so as to avoid excessive spurious triggering and possible loss of critical blast event data.

g) For completeness, for those blast events consisting of only a single type, the K value will also be calculated using Equation 2;

h) For each blast type, the average level of vibration will be calculated by summing the measured, calculated or inferred level of vibration for each blast type initiated over the previous six month period and dividing by the number of blasts of that type that occurred within the same period;

i) The average values will be recalculated each day for each monitoring location and for each blast type and the values appended to the trend graphs.

For each blast within every event, the blast, K value, distance and MIC will be recorded within Blasthub. The tabulated data will be available for export to permit any further analyses as and when required.

## 8.4. Roving Monitor

Under the conditions of consents OGNZL must hold one spare vibration monitoring unit for use as a roving monitor. OGNZL typically operates with another spare unit, the second being a standby monitor used to replace a faulty compliance unit. While the second unit must be available to fulfil its primary function, it can be used as a roving monitor at other times.

The objectives for the roving monitor(s) are;

1. To assess and confirm compliance with the consent vibration limits.
2. The check for anomalous vibration behaviour. .
3. To address residents' concerns about vibration effects and to assist understanding what they are experiencing.
4. To provide additional detail on blast design and behaviour (often when deployed in close proximity to blasts).
5. To identify a new or additional fixed monitoring location (see MDDP condition 16 f).

To achieve objectives 1 to 3, the roving monitor(s) will be deployed in response to a series of complaints from a single residence or area, and/or when requested by a resident. A roving monitor need not be deployed in response to a single complaint, nor when complaints are received following a single blast event that generates a relatively high level of vibration. A roving monitor will only be deployed where its installation is approved by the resident.

Internal monitoring to improve knowledge on blast behaviour and design (objective 4) occurs on an "as required" basis, typically at the request of the Underground Production Manager.

### 8.4.1. *Roving Monitor Procedure*

Achieving the objectives (1-3) of roving monitoring requires a unit to be set at a site of interest for a period to time sufficient to enable vibration results at that site to be compared with results from the permanent vibration monitors and the expected levels of vibration (based on the relevant scale-distance equation and the separation between the site and the locations of the blasts). Recognising the limited number of roving monitors, responding to complaints and monitoring requests may have to be scheduled.

Typically, a roving monitor programme at a property would follow the following sequence until resolved:

1. OGNZL will undertake monitoring upon receipt of a series of complaints from a resident, when the resident requests monitoring, and when a roving monitor is available. Initially, monitoring will be undertaken with the geophone on spikes, in natural ground where practical, and at a specific location on the property agreed to between the resident and monitoring personnel. After monitoring for typically 2 weeks or 20 blast events (whichever completes first), the data will be analysed (including a comparison with compliance monitors) and reported to HDC with a recommendation.

   *Normal configuration settings for residential monitoring are to set the units in 'histogram mode' rather than one of the 'waveform' modes which have higher monitor memory demand. This means*

*that not only can smaller vibrations be determined; the units can be left for longer durations before they reach capacity (this means less disruption to the residents).*

2. If warranted (in discussion with HDC), OGNZL will subsequently continue monitoring (this time, with the geophone on a concrete block) for a further 4 weeks or 50 events (whichever completes first). The data will be analysed (including a comparison with compliance monitors and testing the vibration algorithm) and reported to HDC, along with a recommendation.
3. If the subsequent data indicates sufficiently anomalous data to question the existing compliance network, a range of mitigation measures may be considered in consultation with HDC:
   - Relocation of a nearby compliance monitor to a location more representative of the vicinity.
   - An additional compliance monitor.
   - Either of the above may require additional roving monitoring to determine an even more representative or acceptable location; the site of the initial monitoring may be improved upon, a permanent monitor may be unacceptable to the resident, or practical considerations (e.g. traffic interference) may require a more pragmatic location.
4. All roving blast-monitoring data in response to residents' complaints will be reported to HDC for their consideration as part of the monitoring programme above, along with being held on OGNZL's computer network. Roving data will continue to be included in the three-monthly summary reports submitted to HDC (redacted copies are available on their web-site: http://www.hauraki-dc.govt.nz/).

#### 8.4.2. *Monitoring within Structures*

Monitoring within structures for compliance is generally discouraged. There are large variations within a structure depending on its construction and foundations (some structures dull vibrations while others amplify the transmission) and consent compliance is based upon the level of ground vibration, not structure vibration. This is verified in the conditions of the consents which specify that fixed (compliance) monitoring locations must not be on or inside a building or structure (and that roving monitoring in such locations is not deemed to be compliance monitoring).

### 8.5. Geophones

Figure 1 shows the location of the existing vibration monitors (geophones) associated with the Correnso/Slevin/MDDP projects. These locations were established by agreement with the HDC and are documented in the consents.

Geophones are bolted to a concrete block set in the ground at each site. The site is secured by a protective housing to discourage vandalism. Within the protective housing is an "Instantel MiniMate Plus" seismograph and a cellular modem. Each monitoring station calls the Blasthub computer after being triggered, and at predetermined schedules to conduct administrative checks.

### 8.6. Geophone & Microphone (Sound) Calibration

The seismographs, geophones and microphones undergo annual calibration by an independently certified company. The preferred supplier is Saros Group Pty. Ltd., contact:

27 Douglas St, Milton, Queensland, 4064, Australia.

Tel: 00 61 7 3367 3400 Fax: 00 61 7 3367 3844

Calibration certificates are kept electronically on the Blasthub database (accessible via the internet), with additional copies in the OGNZL Environmental Department database.

Calibration certificates required for geophones and microphones (currently included with geophone certificate) contain the following information:

- Report number
- Make & Model of instrument
- Monitor serial number
- Geophone serial number
- Microphone serial number (if present)

- Calibration date
- Method reference in accordance with ISO/IEC 17025 (1999) & management ISO 9002:1994 accredited
- Test equipment references
- Compliance with relevant standard (Australian national standards of measurements)
- Endorsement certification or logo by accrediting organisation
- Signature of person performing calibration and date of service.

# 9. MITIGATION

As outlined above in s7.2.2, whenever production blasting is initiated in a new area, the first blasts are designed very conservatively and take into consideration the geographical location, geological factors of the ground and the vibration results from nearby production areas. Based on the results of the initial blasts, charging parameters may be altered for subsequent blasts to increase efficiencies whilst still maintaining vibration compliance.

Most the factors that affect vibration management are completed well ahead of OGNZL obtaining the detailed vibration relationship data required to finalise a blast design. Those aspects of mine design that influence blast design (e.g. sub-level spacing) are typically fixed years before blasting occurs in a given area of the mine. Also, key aspects of a blast design (blasthole diameter, burden and spacing) are completed weeks if not months ahead of blasting occurring within a given stope, and the pattern drilled to that design typically weeks ahead of a blast occurring.

Therefore, if an elevated and unexpected vibration result occurs, the only remaining aspect of the design that can usually be modified to reduce vibration is the charge weight. Selection of the appropriate charge weight therefore becomes the fundamental mitigation action.

The following pro-active management regime has therefore been developed. Adhering to the mitigation procedure will minimise the chances of individual or average vibration results above consent limits and minimise vibration effects on the residents of Waihi East.

## 9.1. Mitigation Actions

The objective of mitigation is to minimise significant impacts on residents and ensure processes are in place to avoid a breach of consent.

The primary mitigation for significant impact on residents is compliance with the 95% and average limits specified in consent conditions. While there is no single blast maximum limit (both limits are based on a ‘trend’ of blasts), vibrations larger than 5mm/s are recognised as having a significant detrimental effect on both the 95% and average limits.

Post-blast mitigation measures are based on the same ‘monitor and response’ process as used at OGNZL’s other underground operations as outlined above in s7.2.2. However, in recognition that blasting activities will occur below the residential area of Waihi and therefore close to Waihi residents, and the introduction of an average limit, the following safeguards and responses to blast results have been developed:

Individual Blasts

For any blasts resulting in vibration levels greater than 5mm/s at any compliance monitor, OGNZL will review the blast design and implementation. This review, and any subsequent mitigation measures, will be reported to HDC within five days of the blast. This correspondence will also serve to effect the requirements of consent conditions.

Average Vibration

Separate from investigating individual high PPV blasts, OGNZL will also establish an arbitrary level for the average vibration, which when reached triggers an investigation to ensure that the relevant consent limit is not reached. These arbitrary levels are proposed as 1.9mm/s for development blasts (with a compliance limit of 2mm/s) and 2.9mm/s for production blasts (compliance limit 3mm/s).

Because the average vibration is determined separately for each monitor, in addition to the mitigation options

suggested in condition 22(c), OGNZL may also be able to relocate primary blasting activities to another area to give relief to the affected compliance monitor (and therefore to the residents in that area).

## 10. REPORTING

Records of all vibration monitoring (including roving monitoring) are maintained and can be provided to HDC on request. In the event of an exceedance of compliance standard or a consent breach, OGNZL prepares a specific report to HDC. This report will contain the details of the event, along with the outcome of an investigation and mitigation measures to avoid a recurrence.

OGNZL provides a summary report to the Council at the end of each calendar quarter for all blasting and vibration for the Waihi operations (for practical purposes, HDC has approved calendar quarter reporting, rather than the consent dates specified). This report provides information on blasting undertaken, explosive use, vibration and overpressure levels recorded, compliance and exceedance data, complaints received, and roving monitoring undertaken.

The Company Liaison Officer provides Council with six-monthly reports documenting any complaints (including those relating to vibration) and mitigation action taken.

## 11. COMMUNITY LIAISON

In accordance with conditions of its mining licence, resource consents and land use consents, OGNZL maintains the position of Company Liaison Officer (CLO) to liaise between the consent holder, the community and the Council. *(While not required by a condition of consent, OGNZL has also recently appointed a new position, the Community Engagement Officer to increase its community engagement support.)* The CLO has sufficient delegated power to be able to deal immediately with complaints received and is required to investigate those complaints as soon as possible after receipt.

The contact free-phone number for the CLO is notified in local newspapers as a foot-note in every community update (normally fortnightly). The current CLO and contact details are:

Donna Fisher 0800 WAIHIGOLD (0800 924 444)

In addition to liaison staff, a range of communication and engagement strategies are used for different stakeholder groups as appropriate. These include:

- ‘Open door’ policy for members of the public to meet with Community team members at our Moresby Ave Admin Office.
- A monthly “Update” column in the Waihi Leader, providing information on current mining activities and items of interest.
- A monthly Q&A interview on the local GoldFM radio.
- Monthly publication of the “East Ender’ newsletter distributed to 550 households in Waihi East.
- Press releases in local newspapers in response to media requests or project milestones such as the commencement of blasting.
- The actively managed web-site, http://www.waihigold.co.nz/, providing information on mining activities (e.g. blasting notification and results as itemised in s6.1) and including the “Update”.
- Public notice boards erected at Martha viewing areas to provide project information.
- Letter drops within the community when information about specific issues needs to be circulated.
- House visits to residents seeking further information.
- The use of various forums and groups to gain feedback and provide information (e.g. Waihi Community Forum, and the fledgling Iwi Advisory Group)
- In addition, regular public meetings will be held to present information and receive feedback on past and proposed mining activities, and monitoring results.

### 11.1. Amenity Effect Programme

The consent limits that have been set for mining operations are designed to, and do, avoid nuisance effects for most of the Waihi community for most of the time. OGNZL complies with these limits most of the time but some people living close to the mine consider they experience some reduction in amenity due to increased levels of noise, vibration and possibly dust. Thus, while the Waihi community broadly shares the economic and social benefits of OGNZL's mining operations, a relatively small proportion of the town's population considers it bears some disadvantages from the operations.

In addition to on-going community liaison and complaints management, OGNZL has developed the voluntary Amenity Effect Programme (AEP) and has been implementing this as part of its on-going liaison and consultation programme with the local community. The programme was instigated in 2008 (with payments backdated to 2007), and aims to

- Acknowledge that some people consider their amenity is affected by blast vibration, dust or noise effects;
- Provide an incentive for owners/occupiers to maintain the property ownership/occupation status quo to the maximum extent practicable;
- Provide an incentive for OGNZL to strive to minimise operational effects on the local community; and
- Ensure cost-effectiveness for OGNZL and enable or enhance existing and future land access.

The Correnso, Slevin and MDDP consents make this hitherto voluntary programme a condition requirement (Correnso c15(b), Slevin c9(b), MDDP c14(b)). The property owners or occupiers within the areas affected by operations will be offered payments based on the assessed vibration received at the property; this is determined by utilising the known or assessed vibrations from the compliance monitoring network and making scaled-distance calculations for each individual property.

Payment rates and calculations have been established for the existing (voluntary) AEP through detailed investigations and negotiation. The consents have formalised the payment regime and methodology (Correnso c15(c-i), Slevin c9(c-i), MDDP c14(c-i)) for properties subject to the operations.

Calculating the specific payments to each property is done via a web-based program that utilises the Blasthub database. Those owners/occupiers within the program requesting the information can be provided with a user name and password to access the data for their property.

## 12. COMPLAINT RESPONSE

The OGNZL Standard Operating Procedure WAI-800-PRO-007 Managing Public Complaints (refer Appendix D) will be used for any complaints received from the community.

## 13. TRAINING

All management, staff and contractors who work on site take part in induction training before commencing work on the project. In addition to the site health and safety training, the induction aims at raising general awareness of individual responsibilities for managing and reporting environmental and community effects. Reporting procedures and accountabilities to departmental managers and environmental staff are outlined, and all inductees are provided with a site contact list.

Responsibility for staff environmental awareness and training rests with the Environmental Manager or delegated representative. Environmental personnel undertake vibration monitoring and maintain monitoring infrastructure, with training, support and guidance provided by John Heilig of Heilig & Partners Pty Ltd.

## 14. VIBRATION MANAGEMENT PLAN REVIEW

This VMP may be updated as necessary and modifications to the document may be required as operations proceed. Any modification will be submitted to HDC for review and not implemented until approved. If additional mitigation actions are required to reduce vibration effects, the agreed actions will be implemented by OGNZL as soon as practicable and this VMP (or subsequent versions) will subsequently be modified to reflect changes.

## 15. REFERENCES

Grindlay, G.D., November 2012. Evidence of Glen Grindlay – Golden Link Project including Correnso Underground Mine.

Heilig & Partners Pty Ltd, June 2012: Review of the potential vibration effects of drilling and blasting activities in the Golden Link Project Area.

Heilig, J.H., November 2012. Evidence of John Heilig – Golden Link Project including Correnso Underground Mine.

OceanaGold Waihi, December 2013 (with subsequent amendments): Vibration Management Plan – Correnso Underground Mine).

Tonkin & Taylor, June 2012. Golden Link Project including the Correnso Underground: Application to HDC for resource consent and AEE.

Heilig & Partners Pty Ltd and Lane Associates Ltd, July 2016. Assessment of vibration from the SUPA Project.

Heilig & Partners Pty Ltd, 05 February 2017. Exploration drive blasting assessment. Letter report to OceanaGold NZ Ltd.

## APPENDIX A – VIBRATION CONDITIONS HDC LAND USE CONSENT NO. 202.2012 (CORRENSO)

**Blasting and Vibration**

13. Ground Vibration

    All blast events shall comply with the vibration levels, numbers of events and durations specified in Condition 14.

14. Impulsive Vibration from Blasting

    The activity shall comply with the following standard as measured at the boundary of any residentially zoned site or the notional boundary of any occupied rural dwelling not owned by the consent holder (or related company) or not subject to an agreement with the consent holder (or related company).

    In the event that a property is sold and is not subject to an agreement between the consent holder (or related company) and the purchaser or related company, or in the event that there is no longer an agreement between the consent holder and the landowner, the measurement of vibration shall revert to being on or close to the boundary of that residentially or low-density residentially zoned site or the notional boundary of the occupied rural dwelling.

    a. There shall be no more than three blast events per day, from Monday to Saturday and between 0700 and 2000.
    b. No blasting shall be undertaken at night (2000 to 0700 the following day), on Sundays or on public holidays.
    c. The peak particle velocity (vector sum) shall be no more than:
        i. For development blasts;
            - 5mm/s for 95% of the monitored events.
            - 2mm/s on average.
        ii. For production blasts;
            - 5mm/s for 95% of the monitored events.
            - 3mm/s on average.
    d. Compliance with the 95% and average limits shall be measured over a six-month rolling period.
    e. Compliance with the 95-percentile limit shall be determined separately for development blast events and for production blast events, and based on the highest recorded vibration for each blast event measured at any monitor, where the blast type is assigned on a monitor-by-monitor basis according to the blast with the minimum scaled distance from each monitor.
    f. Compliance with the average limit shall be determined separately for each blast monitor based on the total number of blast events in the six-month rolling period.
    g. For all blast events, including those involving a combination of production and development blasts (95% compliance);
        i. Production blasts shall have a total duration of not more than 9 seconds;
        ii. Development blasts shall have a total duration of not more than 12 seconds;
        iii. A combination of production and development blasts shall have a duration of not more than 12 seconds.
    h. No blast event shall have a duration of more than 18 seconds.
    i. Duration is to be calculated as the time from the nominal firing time of the first charge to the nominal firing time of the last charge.
    j. A ‘Blast Event’ is defined as:

        ‘An individual or number of linked individual blasts of not more than the total duration periods specified above.’

    k. A ‘Development Blast’ is defined as:

'Any blast with a maximum instantaneous charge weight per hole of no more than 7 kilograms of explosive.'

l. A 'Production Blast' is defined as:

'Any blast in which a single hole contains a maximum instantaneous charge weight of more than 7 kilograms of explosive.' Slot blasts are deemed to be Production Blasts for the purpose of this definition.

15. Minimisation and Mitigation of Blasting Impacts

a. In addition to complying with the requirements of Condition 14, the consent holder shall minimise, to the extent practicable, the impacts of blasting vibrations for the Community. The measures to be applied in this regard shall be set out in the Vibration Management Plan (Condition 19) and will include details of how the following requirements will be achieved to the greatest extent practicable:

i. Restrict the duration of blast events to the minimum consistent with safe and efficient mining operations;

ii. Fire the production blasts within the 1pm meal break;

iii. Fire the three defined daily blast windows at shift changes and meal breaks;

iv. Implement timely blast notification procedures;

v. Report blast vibration results in a timely manner.

b. While blasting is occurring as provided for by this consent, the consent holder shall also continue to implement the Amenity Effect Programme (AEP) in respect of vibration as set out below provided that owners and/or tenants who have entered into a separate arrangement with the consent holder and/or have otherwise agreed not to receive the AEP will not be eligible to receive AEP payments under this condition.

c. The consent holder shall use the recorded data from the vibration compliance monitoring network to estimate the vibration received at occupied residences from blasting within the Correnso Underground Mine, and shall make payments to the occupiers of those residences in accordance with the table and criteria below:

**Table: AEP Payment Schedule**

| Vibration Magnitude (mm/s) | Payment per Blast Event ($) |
|---|---|
| ≥1.5 | 17.70 |
| ≥3.5 | 53.00 |
| ≥5 | 177.00 |
| ≥6 | 352.00 |

d. The stated payment rates are those existing at 1 January 2013. The rates will be adjusted for the start of each calendar year by the Consumer Price Index (CPI) published by Statistics New Zealand and made publicly available on the consent holder's website.

e. An occupied residence shall be eligible to receive AEP payments if it receives 2 or more blast events generating vibration of 1.5mm/s or greater in any month.

f. The AEP does not apply to any unoccupied houses or undeveloped residential property.

g. Occupiers of eligible residences shall receive a minimum payment of $250.

h. Payments to occupiers of eligible residences shall be calculated six-monthly, and payment made within two months or as soon as practicable thereafter.

i. Should AEP payments become taxable, the consent holder shall not be liable for any taxes associated with the payments. Nor shall the consent holder be liable for any future changes to national superannuation or other benefits as a result of an eligible occupier receiving the AEP payments required under this consent.

16. Where blast events provided under this consent occur simultaneously with blast events at Trio or Favona Underground Mines or the Martha Mine, the consent holder shall ensure that such blast events comply with the maximum ground vibration level limits specified in Condition 14 of this consent.

17. For the initial 100 blast events of each type, no more than one exceedance of 5mm/s in every 20 consecutive blast events shall be deemed to be compliant with the 95 percentile limit stated in Condition 14.

    The assessment of compliance with the average limits stated in Condition 14 shall not apply until 100 blast events of each type have been fired.

    Once 100 blast events of each type have been fired, compliance with both the 95 percentile and average limits shall be separately assessed for each blast type as per conditions 14 e) and f) respectively.

18. Ventilation Shaft Construction

    No blasting shall be employed in the construction of the ventilation shaft which is approved in terms of this consent.

19. Vibration Management Plan

    The consent holder shall prepare a Vibration Management Plan for written approval by the Council. The objective of the Plan is to provide detail on how compliance with vibration consent Conditions 14 to 22 and 80 will be achieved for the duration of this consent. This Plan shall be submitted to the Council at least 1 month prior to the exercise of this consent and the consent shall not be exercised until the Vibration Management Plan has been approved by the Council. The Vibration Management Plan may be reviewed and amended from time to time, subject to the approval of the Council but not in a manner inconsistent with these conditions.

    The Plan shall specifically include the following:

    a. Measures to be adopted to meet the conditions of this consent to ensure that blast vibrations for both development and production blasts are minimised to the greatest extent practicable, including;
        i. Description of the blast design criteria and blast design review procedures. All blasts shall be designed to a 95% level of confidence to achieve the vibration levels specified in Condition 14 and the requirements of Condition 15a).
        ii. The numbers, times (generally around shift changeovers), duration of blast events, and in general terms the coordination of development and production blasts into one blast event and steps to minimise the duration of blast events.
        iii. Procedures to be adopted where vibration levels approach the maximum permitted levels and mitigation actions to be implemented in the event of an exceedance of the limits stated in Condition 14.
        iv. The methods and procedures to be adopted to enable the separate recording and reporting of development and slot / production blasting.
        v. The methods and procedures to be adopted in deploying the roving monitor(s), data usage from the roving monitors, and identifying circumstances where vibration monitoring within structures shall be considered. Any monitoring undertaken in these circumstances is deemed not to be compliance monitoring.
    b. Further detail on the Amenity Effect Programme as required under Condition 15b).
    c. The location of fixed monitoring locations to be established in accordance with Condition 20d).
    d. The properties to be surveyed in accordance with condition 21 a).
    e. Records to be kept, including blast design data.

    Advice note:

    The Vibration Management Plan may be prepared in conjunction with the Vibration Management Plans prepared in accordance with the consent requirements applying to other mines in the Waihi area.

20. Blasting and Vibration Monitoring

    a. The consent holder shall monitor impulsive vibration from all blast events associated with the mining provided for under this consent.

b. The monitoring system shall be automated to allow for the prompt analysis of each blast event.

c. Suitably trained personnel shall conduct any monitoring required under this consent, including the installation of roving monitors. Equipment used for monitoring, equipment calibration and vibration measurement procedures shall comply with the current Australian Standard AS2187.2 (or equivalent international standards) and equipment manufacturers' recommendations.

d. Unless otherwise required or confirmed in writing by the Council, the fixed monitoring locations for the Correnso Underground Mine shall be those shown in Figure 3. These monitoring locations pertain to the Correnso ore body and will need to be reviewed if the operations move to new areas.

e. The fixed monitoring locations shall not be on or inside a building or structure.

f. Pursuant to condition 20(d), data received from a roving monitor may identify a new or additional permanent monitoring location.

g. A roving monitor shall be deployed to record vibrations in locations where complaints regarding vibration have been made in accordance with a procedure specified in the approved Vibration Management Plan required under Condition 19.

h. A complete record of each blast event shall be maintained. The record shall include:

   i. Types of measurement instrument used.
   ii. Time and duration of blast event.
   iii. Location of blasts.
   iv. Locations of monitoring positions.
   v. Distances from the blasts to the monitoring position and nearest residence.
   vi. Measured vibration levels.
   vii. Total amount of explosive used.
   viii. Delay sequence of the blast event.
   ix. Maximum instantaneous charge.
   x. Volume of rock blasted.
   xi. Complaints (including the nature of effects, for example rattling window, was the complainant awoken) and whether the vibration mitigation action process has been undertaken (Condition 22 c))
   xii. Design criteria not covered in items (i) to (xi) above.

Advice note:

While this condition relates only to the monitoring of blast vibration associated with the mining activities provided for under this consent, similar conditions of the consent apply to all of the consent holder's other mining operations such that the consent holder is required to monitor blast vibrations from all of its mining activities.

21. Property Damage

a. Before blasting associated with the Correnso Underground Mine starts, and provided the property owner consents, the consent holder shall complete a structural condition survey for at least 15 representative properties (excluding properties owned by the consent holder at that time) as agreed in writing by the Council. The representative properties are to be located in the vicinity of the vibration monitors required under Condition 20 d). In addition to these properties, structural condition surveys shall be carried out as follows (subject to owner's agreement):

   i. At 'control' properties removed from the influence of any potential vibration effects from mining, as approved by the Council.
   ii. At Waihi East School and kindergarten.
   iii. At the former Mine Manager's house (57 Barry Road).

The survey properties shall be identified in the Vibration Management Plan (Condition 19).

The surveys shall be carried out by an independent structural engineer suitably qualified and experienced in domestic building design and construction. The survey reports shall include a visual inspection and video record of all existing built surfaces and defects including concrete accessways.

b) Upon receipt of a complaint of property damage an appropriately qualified staff member of the consent holder shall investigate and respond to the complaint within five business days or as soon thereafter as practicable unless the matter is considered urgent.

If the resident does not agree with advice from the consent holder's representative the consent holder may, or if the cause of the damage is unclear the consent holder shall, engage an appropriately qualified independent third party to investigate and report to both the homeowner and consent holder. The consent holder shall request that report to be available in 30 days unless considered urgent by the independent third party in which case the report shall be made available as soon as practicable. If the resident does not agree with the advice and the consent holder does not engage a third party then the resident may contact the Council, and if the Council determines, after investigation, that a third party investigation is warranted then the consent holder shall commission and meet the reasonable costs of that investigation.

If the advice of the independent third party or the consent holder's representative determines that the cause of the damage is attributable to activities authorised by this consent then the consent holder will remedy the damage at its cost as soon as practicable in accordance with any recommendation by the third party and to the reasonable satisfaction of the resident.

If any dispute arises in accordance with this clause, then the consent holder will offer to the resident the opportunity to enter binding arbitration through the Independent Review Panel (IRP). If the resident chooses not to participate in that binding arbitration then the consent holder's obligations under this condition are at an end.

In the event that the IRP cannot conduct this arbitration function, the Council shall mediate the dispute under the same terms as the IRP.

For the purposes of this consent the IRP shall be as established and amended from time to time by the Waihi Community Forum (WCF).

22. Management and Reporting

a. Throughout the period of mining provided for under this consent, at the start of each calendar month the consent holder shall prepare a two-dimensional plan showing the existing mining and the proposed areas of mining activities during that month. The plan shall be loaded onto a page of the consent holder's website. A downloadable pdf version of the plan shall be available from the web page and hard copies shall be available for collection from the Waihi Information Centre and the Hauraki District Council Waihi Service Centre, and on request.

The consent holder shall use its best endeavours to restrict its blasting to the work areas defined on the plan recognising that operational constraints prevail and may lead to deviations from the plan during the course of the month.

b. No blasting operations shall be carried out without the written approval of the Mine Manager. Before blasting commences, the Mine Manager shall ensure that the operations will not cause danger, damage or undue discomfort to any person nor danger and damage to property.

c. In the event that blast monitoring shows that the vibration standards have been exceeded, the consent holder shall implement mitigation actions to ensure compliance. Possible mitigation actions include but are not limited to:

i. Limiting the rate of excavation advance.

ii. Reducing the blast hole diameter.

iii. Reducing the weight of explosive in the blast hole.

iv. Using alternative explosive types.

v. Using electronic delays to adjust sequencing.
vi. Decking.
vii. Changing the blast pattern.
viii. Drilling and blasting in two passes.
ix. Changing the method of mining.

d. The consent holder shall provide a report to Council for each blast event where the measured vibration exceeds the specified maximum limits. The reports shall be submitted within five (5) days after the blast event and include the records listed in Condition 20 h) above and mitigation actions taken to limit subsequent blast vibrations to the maximum limits or less as generally outlined in Condition 22 c).

e. The consent holder shall, prior to the first development blast event pursuant to this consent, establish a page on its website that will show the recorded vibration magnitude for the last ten blast events for each of the compliance monitors required under Condition 20 d). The results of the most recent blast event will:
    i. be posted on the web page as soon as practicable after the occurrence of that blast event; and
    ii. remain provisional until they are verified

f. The consent holder shall provide a summary report to Council at three (3) monthly intervals after commencement of the Correnso Underground Mine. The report shall include the following:
    i. Confirmation of actions taken during the previous reporting period.
    ii. All vibration related complaints received during the current reporting period and mitigation actions taken by the consent holder.
    iii. Results of vibration monitoring separately for development and production blasts.
    iv. All roving monitor data results recorded during the quarter.

g. Monitoring records, reports and complaint schedules shall be stored securely and maintained in a systematic manner for 12 months after completion of all blasting at the underground mine. Records shall be available for perusal by Council and its representatives on request.


| Figure 3 |
| --- |
| Position of fixed monitors |

## APPENDIX B – VIBRATION CONDITIONS HDC LAND USE CONSENT LUSE-202.2016.544.001 (SUPA)

**Blasting and Vibration**

7. Ground Vibration

   All blast events shall comply with the vibration levels, numbers of events and durations specified in Condition 8.

8. Impulsive Vibration from Blasting

   The activity shall comply with the following standard as measured at the boundary of any residentially or low density residentially zoned site or the notional boundary of any occupied rural dwelling not owned by the consent holder (or related company) or not subject to an agreement with the consent holder (or related company).

   In the event that a property is sold and is not subject to an agreement between the consent holder (or related company) and the purchaser or related company, or in the event that there is no longer an agreement between the consent holder and the landowner, the measurement of vibration shall revert to being on or close to the boundary of that residentially or low-density residentially zoned site or the notional boundary of the occupied rural dwelling.

   a. There shall be no more than three blast events per day, from Monday to Saturday and between 0700 and 2000.
   b. No blasting shall be undertaken at night (2000 to 0700 the following day), on Sundays or on public holidays.
   c. The peak particle velocity (vector sum) shall be no more than:
      i. For development blasts;
         - 5mm/s for 95% of the monitored events.
         - 2mm/s on average.
      ii. For production blasts;
         - 5mm/s for 95% of the monitored events.
         - 3mm/s on average.
   d. Compliance with the 95% and average limits shall be measured over a six-month rolling period.
   e. Compliance with the 95-percentile limit shall be determined separately for development blast events and for production blast events, and based on the highest recorded vibration for each blast event measured at any monitor, where the blast type is assigned on a monitor-by-monitor basis according to the blast with the minimum scaled distance from each monitor.
   f. Compliance with the average limit shall be determined separately for each blast monitor based on the total number of blast events in the six-month rolling period.
   g. For all blast events, including those involving a combination of production and development blasts (95% compliance);
      iii. Production blasts shall have a total duration of not more than 9 seconds;
      iv. Development blasts shall have a total duration of not more than 12 seconds;
      v. A combination of production and development blasts shall have a duration of not more than 12 seconds.
   h. No blast event shall have a duration of more than 18 seconds.
   i. Duration is to be calculated as the time from the nominal firing time of the first charge to the nominal firing time of the last charge.
   j. A ‘Blast Event’ is defined as:

      ‘An individual or number of linked individual blasts of not more than the total duration periods specified above.’
   k. A ‘Development Blast’ is defined as:

'Any blast with a maximum instantaneous charge weight per hole of no more than 7 kilograms of explosive.'

l. A 'Production Blast' is defined as:

'Any blast in which a single hole contains a maximum instantaneous charge weight of more than 7 kilograms of explosive.' Slot blasts are deemed to be Production Blasts for the purpose of this definition.

Advice Notes:

There shall be no more than three blast events per day from within CEPPA and SUPA combined. For condition 8c, the averages and 95 percentiles will be calculated for vibration from blasting within both SUPA and CEPPA combined.

9. Minimisation and Mitigation of Blasting Impacts

a. In addition to complying with the requirements of Condition 8, the consent holder shall minimise, to the extent practicable, the impacts of blasting vibrations for the Community. The measures to be applied in this regard shall be set out in the Vibration Management Plan (Condition 11) and will include details of how the following requirements will be achieved to the greatest extent practicable:

i. Restrict the duration of blast events to the minimum consistent with safe and efficient mining operations;

ii. Fire the production blasts within the 1 pm meal break;

iii. Fire the three defined daily blast windows at shift changes and meal breaks;

iv. Implement timely blast notification procedures;

v. Report blast vibration results in a timely manner.

b. While blasting is occurring as provided for by this consent, the consent holder shall also continue to implement the Amenity Effect Programme (AEP) in respect of vibration as set out below provided that owners and/or tenants who have entered into a separate arrangement with the consent holder and/or have otherwise agreed not to receive the AEP will not be eligible to receive AEP payments under this condition.

c. The consent holder shall use the recorded data from the vibration compliance monitoring network to estimate the vibration received at occupied residences from blasting within the Slevin Underground Mine, and shall make payments to the occupiers of those residences in accordance with the table and criteria below:

**Table: AEP Payment Schedule**

| Vibration Magnitude (mm/s) | Payment per Blast Event ($) |
|---|---|
| ≥1.5 | 17.70 |
| ≥3.5 | 53.00 |
| ≥5 | 177.00 |
| ≥6 | 352.00 |

d. The stated payment rates are those existing at 1 January 2013. The rates will be adjusted for the start of each calendar year by the Consumer Price Index (CPI) published by Statistics New Zealand and made publicly available on the consent holder's website.

e. An occupied residence shall be eligible to receive AEP payments if it receives 2 or more blast events generating vibration of 1.5mm/s or greater in any month.

f. The AEP does not apply to any unoccupied houses or undeveloped residential property.

g. Occupiers of eligible residences shall receive a minimum payment of $250.

h. Payments to occupiers of eligible residences shall be calculated six-monthly, and payment made within two months or as soon as practicable thereafter.

i. Should AEP payments become taxable, the consent holder shall not be liable for any taxes associated with the payments. Nor shall the consent holder be liable for any future changes

to national superannuation or other benefits as a result of an eligible occupier receiving the AEP payments required under this consent.

Advice Note: For the purposes of determining AEP payments the AEP payments will be based on the recorded vibration data from both CEPPA and SUPA combined.

10. Where blast events provided under this consent occur simultaneously with blast events at Trio, Favona or Correnso Underground Mines or the Martha Mine, the consent holder shall ensure that such blast events comply with the maximum ground vibration level limits specified in Condition 8 of this consent.

11. Vibration Management Plan

The consent holder shall prepare a Vibration Management Plan for written approval by the Council. The objective of the Plan is to provide detail on how compliance with vibration consent Conditions 7 to 14 and 42 will be achieved for the duration of this consent. This Plan shall be submitted to the Council at least 2 weeks prior to the exercise of this consent and the consent shall not be exercised until the Vibration Management Plan has been approved by the Council. The Vibration Management Plan may be reviewed and amended from time to time, subject to the approval of the Council but not in a manner inconsistent with these conditions.

The Plan shall specifically include the following:

a. Measures to be adopted to meet the conditions of this consent to ensure that blast vibrations for both development and production blasts are minimised to the greatest extent practicable, including;
    i. Description of the blast design criteria and blast design review procedures. All blasts shall be designed to a 95% level of confidence to achieve the vibration levels specified in Condition 8 and the requirements of Condition 9a).
    ii. The numbers, times (generally around shift changeovers), duration of blast events, and in general terms the coordination of development and production blasts into one blast event and steps to minimise the duration of blast events.
    iii. Procedures to be adopted where vibration levels approach the maximum permitted levels and mitigation actions to be implemented in the event of an exceedance of the limits stated in Condition 8.
    iv. The methods and procedures to be adopted to enable the separate recording and reporting of development and slot / production blasting.
    v. The methods and procedures to be adopted in deploying the roving monitor(s), data usage from the roving monitors, and identifying circumstances where vibration monitoring within structures shall be considered. Any monitoring undertaken in these circumstances is deemed not to be compliance monitoring.
b. Further detail on the Amenity Effect Programme as required under Condition 9b).
c. The location of fixed monitoring locations to be established in accordance with Condition 12d).
d. Records to be kept, including blast design data.

**Advice note:**

The Vibration Management Plan may be prepared in conjunction with the Vibration Management Plans prepared in accordance with the consent requirements applying to other mines in the Waihi area.

12. Blasting and Vibration Monitoring

a. The consent holder shall monitor impulsive vibration from all blast events associated with the mining provided for under this consent.
b. The monitoring system shall be automated to allow for the prompt analysis of each blast event.
c. Suitably trained personnel shall conduct any monitoring required under this consent, including the installation of roving monitors. Equipment used for monitoring, equipment calibration and vibration measurement procedures shall comply with the current Australian Standard AS2187.2 (or equivalent international standards) and equipment manufacturers' recommendations.

d. Unless otherwise required or confirmed in writing by the Council, the fixed monitoring locations for the Slevin Underground Mine shall be those shown in Figure 2. These monitoring locations pertain to the Slevin ore body and will need to be reviewed if the operations move to new areas.

e. The fixed monitoring locations shall not be on or inside a building or structure.

f. Pursuant to condition 12(d), data received from a roving monitor may identify a new or additional permanent monitoring location.

g. A roving monitor shall be deployed to record vibrations in locations where complaints regarding vibration have been made in accordance with a procedure specified in the approved Vibration Management Plan required under Condition 11.

h. A complete record of each blast event shall be maintained. The record shall include:

   i. Types of measurement instrument used.
   ii. Time and duration of blast event.
   iii. Locations of blasts.
   iv. Locations of monitoring positions.
   v. Distances from the blasts to the monitoring position and nearest residence.
   vi. Measured vibration levels.
   vii. Total amount of explosive used.
   viii. Delay sequence of the blast event.
   ix. Maximum instantaneous charge.
   x. Volume of rock blasted.
   xi. Complaints (including the nature of effects, for example rattling window, was the complainant awoken) and whether the vibration mitigation action process has been undertaken (Condition 14 c))
   xii. Design criteria not covered in items (i) to (xi) above.

Advice note:

While this condition relates only to the monitoring of blast vibration associated with the mining activities provided for under this consent, similar conditions apply to all of the consent holder's other mining operations and require the consent holder to monitor blast vibrations from all of its mining activities.

13. Property Damage

a) Upon receipt of a complaint of property damage an appropriately qualified staff member of the consent holder shall investigate and respond to the complaint within five business days or as soon thereafter as practicable unless the matter is considered urgent.

If the resident does not agree with advice from the consent holder's representative the consent holder may, or if the cause of the damage is unclear the consent holder shall, engage an appropriately qualified independent third party to investigate and report to both the homeowner and consent holder. The consent holder shall request that report to be available in 30 days unless considered urgent by the independent third party in which case the report shall be made available as soon as practicable. If the resident does not agree with the advice and the consent holder does not engage a third party then the resident may contact the Council, and if the Council determines, after investigation, that a third party investigation is warranted then the consent holder shall commission and meet the reasonable costs of that investigation.

If the advice of the independent third party or the consent holder's representative determines that the cause of the damage is attributable to activities authorised by this consent then the consent holder will remedy the damage at its cost as soon as practicable in accordance with any recommendation made by the third party and to the reasonable satisfaction of the resident.

If any dispute arises in accordance with this clause, then the consent holder will offer to the resident the opportunity to enter binding arbitration through the Independent Review Panel (IRP). If the resident chooses not to participate in that binding arbitration then the consent holder's obligations under this condition are at an end.

In the event that the IRP cannot conduct this arbitration function, the Council shall mediate the dispute under the same terms as the IRP.

For the purposes of this consent the IRP shall be as established and amended from time to time by the Waihi Community Forum (WCF).

14. Management and Reporting

a. Throughout the period of mining provided for under this consent, at the start of each calendar month the consent holder shall prepare a two-dimensional plan showing the existing mining and the proposed areas of mining activities during that month. The plan shall be loaded onto a page of the consent holder's website. A downloadable pdf version of the plan shall be available from the web page and hard copies shall be available for collection from the Waihi Information Centre and the Hauraki District Council Waihi Service Centre, and on request.

   The consent holder shall use its best endeavours to restrict its blasting to the work areas defined on the plan recognising that operational constraints prevail and may lead to deviations from the plan during the course of the month.

b. No blasting operations shall be carried out without the written approval of the Mine Manager. Before blasting commences, the Mine Manager shall ensure that the operations will not cause danger, damage or undue discomfort to any person nor danger and damage to property.

c. In the event that blast monitoring shows that the vibration standards have been exceeded, the consent holder shall implement mitigation actions to ensure compliance. Possible mitigation actions include but are not limited to:

   i. Limiting the rate of excavation advance.
   ii. Reducing the blast hole diameter.
   iii. Reducing the weight of explosive in the blast hole.
   iv. Using alternative explosive types.
   v. Using electronic delays to adjust sequencing.
   vi. Decking.
   vii. Changing the blast pattern.
   viii. Drilling and blasting in two passes.
   ix. Changing the method of mining.

d. The consent holder shall provide a report to Council for each blast event where the measured vibration exceeds the specified maximum limits. The reports shall be submitted within five (5) days after the blast event and include the records listed in Condition 12 h) above and mitigation actions taken to limit subsequent blast vibrations to the maximum limits or less as generally outlined in Condition 14 c).

e. The consent holder shall record the vibration magnitude for blast events resulting from the Slevin underground Mine on its website. The results of the most recent blast event will:

   i. be posted on the web page as soon as practicable after the occurrence of that blast event; and
   ii. remain provisional until they are verified

f. The consent holder shall provide a summary report to Council at three (3) monthly intervals after the first exercise of this consent as provided for by condition 4. The report shall include the following:

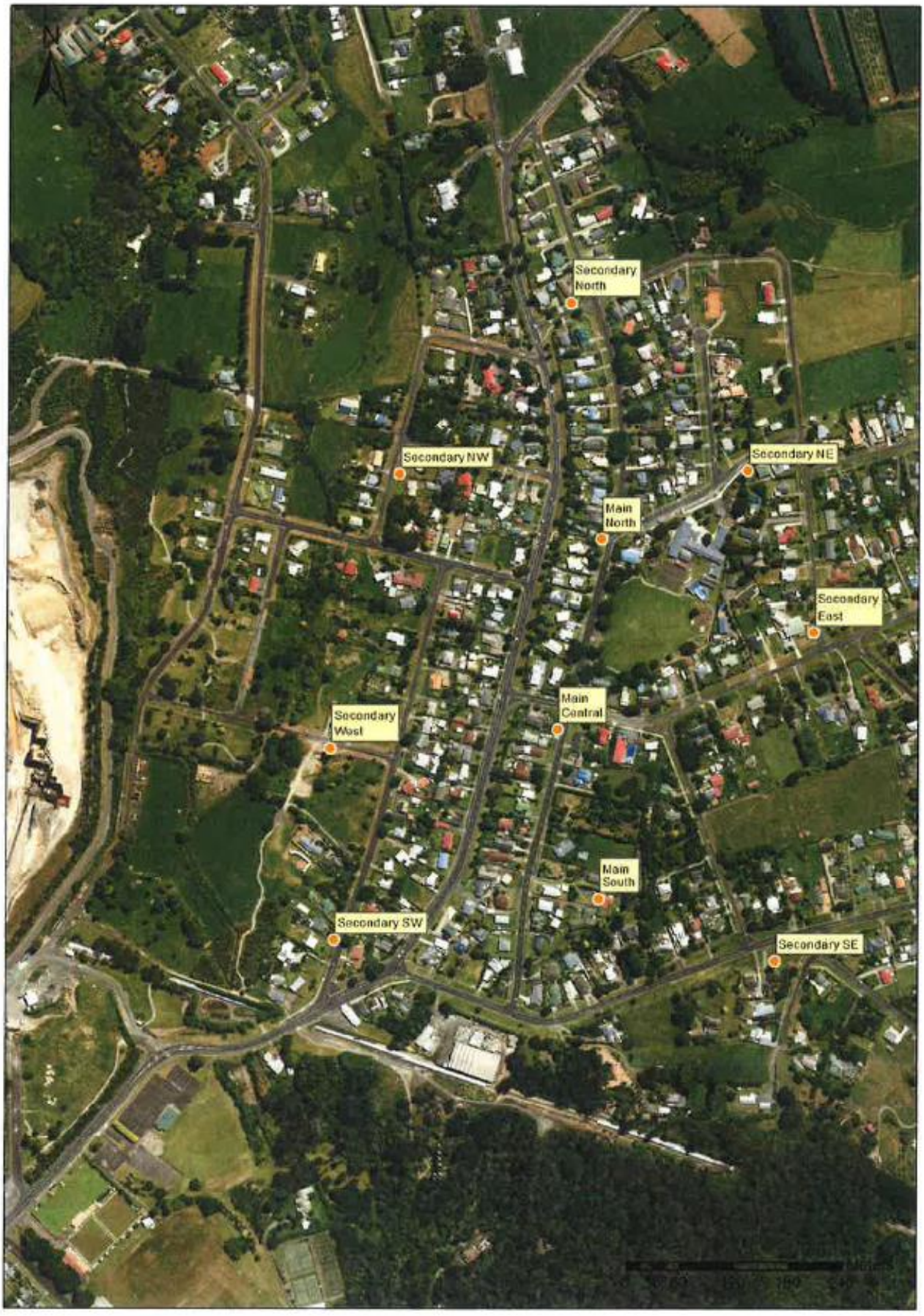
   i. Confirmation of actions taken during the previous reporting period.
   ii. All vibration related complaints received during the current reporting period and mitigation actions taken by the consent holder.

iii. Results of vibration monitoring separately for development and production blasts.

iv. All roving monitor data results recorded during the quarter.

g. Monitoring records, reports and complaint schedules shall be stored securely and maintained in a systematic manner for 12 months after completion of all blasting at the underground mine. Records shall be available for perusal by Council and its representatives on request.

Figure 2: Location of Vibration Monitoring Sites



## APPENDIX C – VIBRATION CONDITIONS HDC LAND USE CONSENT LUC RC-664.001.2017 (MDDP)

13 Impulsive Vibration from Blasting

The activity shall comply with the following standard as measured at the boundary of any site not zoned Rural or in the case of land zoned Rural, the notional boundary of any occupied rural dwelling where the site or occupied rural dwelling is not owned by the consent holder (or related company) or not subject to an agreement with the consent holder (or related company).

In the event that a property is sold and is not subject to an agreement between the consent holder (or related company) and the purchaser or related company, or in the event that there is no longer an agreement between the consent holder and the landowner, the measurement of vibration shall revert to being on or close to the boundary of that site not zoned Rural or in the case of land zoned Rural, the notional boundary of the occupied rural dwelling.

a) There shall be no more than three blast events per day, from Monday to Saturday and between 0700 and 2000.

b) No blasting shall be undertaken at night (2000 to 0700 the following day), on Sundays or on public holidays.

c) The peak particle velocity (vector sum) shall be no more than:
   i) 5mm/s for 95% of the monitored events.
   ii) 2mm/s on average.

d) Compliance with the 95% and average limits shall be measured over a six-month rolling period.

e) Compliance with the 95-percentile limit shall be determined based on the highest recorded vibration for each blast event measured at any monitor.

f) Compliance with the average limit shall be determined separately for each blast monitor based on the total number of blast events in the six-month rolling period. The blast monitors for compliance measuring purposes shall be those fixed monitors as described in condition 16 d).

g) Blast events shall have a total duration of not more than 12 seconds;

h) Duration is to be calculated as the time from the nominal firing time of the first charge to the nominal firing time of the last charge.

i) A 'Blast Event' is defined as 'An individual or number of linked individual blasts of not more than the total duration periods specified above.'

**Advice Note:**

There shall be no more than three blast events per day from within CEPPA, SUPA and the MDDP combined. For condition 13c)), the averages and 95 percentiles will be calculated for vibration from blasting within both SUPA, CEPPA and MDDP combined.

14 Minimisation and Mitigation of Blasting Impacts

a) In addition to complying with the requirements of condition 13, the consent holder shall minimise, to the extent practicable, the impacts of blasting vibrations for the community. The measures to be applied in this regard shall be set out in the Vibration Management Plan (condition 0) and will include details of how the following requirements will be achieved to the greatest extent practicable:

i) Restrict the duration of blast events to the minimum consistent with safe and efficient mining operations;

ii) Fire the three defined daily blast windows at shift changes and meal breaks;

iii) Implement timely blast notification procedures;

iv) Report blast vibration results in a timely manner.

b) While blasting is occurring as provided for by this consent, the consent holder shall also continue to implement the Amenity Effect Programme (AEP) in respect of vibration as set out below provided that owners and/or tenants who have entered into a separate arrangement with the consent holder and/or have otherwise agreed not to receive the AEP will not be eligible to receive AEP payments under this condition.

c) The consent holder shall use the recorded data from the vibration compliance monitoring network to estimate the vibration received at occupied residences from blasting within the MDDP, and shall make payments to the occupiers of those residences in accordance with the table and criteria below:

Table: AEP Payment Schedule

| Vibration Magnitude (mm/s) | Payment per Blast Event ($) |
|---|---|
| ≥1.5 | 17.70 |
| ≥3.5 | 53.00 |
| ≥5 | 177.00 |
| ≥6 | 352.00 |

d) The stated payment rates are those existing at 1 January 2013. The rates will be adjusted for the start of each calendar year by the Consumer Price Index (CPI) published by Statistics New Zealand and made publicly available on the consent holder's website.

e) An occupied residence shall be eligible to receive AEP payments if it receives two or more blast events generating vibration of 1.5mm/s or greater in any month.

f) The AEP does not apply to any unoccupied houses or undeveloped residential property.

g) Occupiers of eligible residences shall receive a minimum payment of $250.

h) Payments to occupiers of eligible residences shall be calculated six-monthly, and payment made within two months or as soon as practicable thereafter.

i) Should AEP payments become taxable, the consent holder shall not be liable for any taxes associated with the payments. Nor shall the consent holder be liable for any future changes to national superannuation or other benefits as a result of an eligible occupier receiving the AEP payments required under this consent.

**Advice Note:**

For the purposes of determining AEP payments the AEP payments will be based on the recorded vibration data from CEPPA, SUPA and MDDP combined.

15 Where blast events provided under this consent occur simultaneously with blast events at the Trio, Favona or Martha mines, or within CEPPA or SUPA, the consent holder shall ensure that such blast events comply with the maximum ground vibration level limits specified in condition 13 of this consent.

16 Blasting and Vibration Monitoring

a) The consent holder shall monitor impulsive vibration from all blast events associated with the mining provided for under this consent.

b) The monitoring system shall be automated to allow for the prompt analysis of each blast event.

c) Suitably trained personnel shall conduct any monitoring required under this consent, including the installation of roving monitors. Equipment used for monitoring, equipment calibration and vibration measurement procedures shall comply with the current Australian Standard AS2187.2 (or equivalent international standards) and equipment manufacturers' recommendations.

d) Unless otherwise required or confirmed in writing by the Council, the fixed monitoring locations for the MDDP shall be those shown as the MDDP monitors in in Figure 3 together with an additional monitor to be located between the Pensioner Flats and the Central School. The location of the additional monitor is to be confirmed with the Council prior to installation and be in place within 4 months of the commencement of this consent. The procedure to be employed in determining the location of the additional monitor shall be described in the Vibration Management Plan required by condition 19

e) The fixed monitoring locations shall not be on or inside a building or structure.

f) Pursuant to condition 0d), data received from a roving monitor may identify a new or additional fixed monitoring location.

g) A roving monitor shall be deployed to record vibrations in locations where complaints regarding vibration have been made in accordance with a procedure specified in the approved Vibration Management Plan required under condition 0.

h) A complete record of each blast event shall be maintained. The record shall include:

i) Types of measurement instrument used.

ii) Time and duration of blast event.

iii) Locations of blasts.

iv) Locations of monitoring positions.

v) Distances from the blasts to the monitoring position and nearest residence.

vi) Measured vibration levels.

vii) Total amount of explosive used.

viii) Delay sequence of the blast event.

ix) Maximum instantaneous charge.

x) Volume of rock blasted.

xi) Complaints (including the nature of effects, for example rattling window, was the complainant awoken) and whether the vibration mitigation action process has been undertaken (condition 0.

xii) Design criteria not covered in items i) to xi) above.

**Advice note:**

While this condition relates only to the monitoring of blast vibration associated with the mining activities provided for under this consent, similar conditions apply to all of the consent holder's other mining operations and require the consent holder to monitor blast vibrations from all of its mining activities.

17 Property Damage

a) Upon receipt of a complaint of property damage an appropriately qualified staff member of the consent holder shall investigate and respond to the complaint within five business days or as soon thereafter as practicable unless the matter is considered urgent.

If the property owner does not agree with advice from the consent holder's representative the consent holder may, or if the cause of the damage is unclear the consent holder shall, engage an appropriately qualified independent third party to investigate and report to both the property owner and consent holder. The consent holder shall request that report to be available in 30 days unless considered urgent by the independent third party in which case the report shall be made available as soon as practicable. If the property owner does not agree with the advice and the consent holder does not engage a third party then the resident may contact the Council, and if the Council determines, after investigation, that a third-party investigation is warranted then the consent holder shall commission and meet the reasonable costs of that investigation.

If the advice of the independent third party or the consent holder's representative determines that the cause of the damage is attributable to activities authorised by this consent then the consent holder will remedy the damage at its cost as soon as practicable in accordance with any recommendation made by the third party and to the reasonable satisfaction of the resident.

If any dispute arises in accordance with this clause, then the consent holder will offer to the property owner the opportunity to enter binding arbitration through the Independent Review Panel (IRP). If the property owner chooses not to participate in that binding arbitration then the consent holder's obligations under this condition are at an end.

In the event that the IRP cannot conduct this arbitration function, the Council shall mediate the dispute under the same terms as the IRP.

For the purposes of this consent the IRP will be as established and amended from time to time by the Waihi Community Forum (WCF).

18 Management and Reporting

a) Throughout the period of mining provided for under this consent, at the start of each calendar month the consent holder shall prepare a two- dimensional plan showing the existing mining and the proposed areas of mining activities during that month. The plan shall be loaded onto a page of the consent holder's website. A downloadable pdf version of the plan shall be available from the web page and hard copies shall be available for collection from the Waihi Information Centre and the Hauraki District Council Waihi Service Centre, and on request.

The consent holder shall use its best endeavours to restrict its blasting to the work areas defined on the plan recognising that operational constraints prevail and may lead to deviations from the plan during the course of the month.

b) No blasting operations shall be carried out without the written approval of the Mine Manager. Before blasting commences, the Mine Manager shall ensure that the operations will not cause danger, damage or undue discomfort to any person nor danger and damage to property.

c) In the event that blast monitoring shows that the vibration standards have been exceeded, the consent holder shall implement mitigation actions to ensure compliance. Possible

mitigation actions include but are not limited to:

i) Limiting the rate of excavation advance.

ii) Reducing the blast hole diameter.

iii) Reducing the weight of explosive in the blast hole.

iv) Using alternative explosive types.

v) Using electronic delays to adjust sequencing.

vi) Changing the blast pattern.

vii) Changing the method of development.

d) The consent holder shall provide a report to Council for each blast event where the measured vibration exceeds the specified maximum limits. The reports shall be submitted within five days after the blast event and include the records listed in condition 0h) above and mitigation actions taken to limit subsequent blast vibrations to the maximum limits or less as generally outlined in condition 00.

e) The consent holder shall record the vibration magnitude for blast events resulting from the MDDP on its website. The results of the most recent blast event will:

i) be posted on the web page as soon as practicable after the occurrence of that blast event; and

ii) remain provisional until they are verified.

f) The consent holder shall provide a summary report to Council at three-monthly intervals after the first exercise of this consent as provided for by condition 4. The report shall include the following:

i) Confirmation of actions taken during the previous reporting period.

ii) All vibration related complaints received during the current reporting period and mitigation actions taken by the consent holder.

iii) Results of vibration monitoring for development blasts.

iv) All roving monitor data results recorded during the quarter.

g) Monitoring records, reports and complaint schedules shall be stored securely and maintained in a systematic manner for 12 months after completion of all blasting at MDDP. Records shall be available for perusal by Council and its representatives on request.

19 Vibration Management Plan

The consent holder shall prepare a Vibration Management Plan for written approval by the Council. The objective of the Plan is to provide detail on how compliance with vibration consent conditions 13 to 0 and **Error! Reference source not found.** will be achieved for the duration of this consent. This Plan shall be submitted to the Council at least two weeks prior to the exercise of this consent and the consent shall not be exercised until the Vibration Management Plan has been approved by the Council. The Vibration Management Plan may be reviewed and amended from time to time, subject to the approval of the Council but not in a manner inconsistent with these conditions.

The Plan shall specifically include the following:

a) Measures to be adopted to meet the conditions of this consent to ensure that blast vibrations are minimised to the greatest extent practicable, including;

i) Description of the blast design criteria and blast design review procedures. All blasts

shall be designed to a 95% level of confidence to achieve the vibration levels specified in condition 13 and the requirements of condition 14a).

ii) The numbers, times (generally around shift changeovers), duration of blast events, and in general terms the coordination of blasts into one blast event and steps to minimise the duration of blast events.

iii) Procedures to be adopted where vibration levels approach the maximum permitted levels and mitigation actions to be implemented in the event of an exceedance of the limits stated in condition 13.

iv) The methods and procedures to be adopted in deploying the roving monitor(s), data usage from the roving monitors, and identifying circumstances where vibration monitoring within structures shall be considered. Any monitoring undertaken in these circumstances is deemed not to be compliance monitoring.

b) Further detail on the Amenity Effect Programme as required under condition 14b).

c) The location of fixed monitors to be established in accordance with condition 0d).

d) Records to be kept, including blast design data.

**Advice note:**

The Vibration Management Plan may be prepared in conjunction with the Vibration Management Plans prepared in accordance with the consent requirements applying to other mines in the Waihi area.


OCEANAGOLD WAIHI OPERATION

**Fixed Vibration Monitor Locations**

Figure 3

Date: 07 July 2017

## APPENDIX D – OGNZL SOP WAI-800-PRO-007 MANAGING PUBLIC COMPLAINTS

# Standard Operating Procedure
# Managing Public Complaints
## WAI-800-PRO-007

NWO-SCR-SO-70-9747

This is no longer a controlled document once printed.
This document must not be released outside of the company without permission of the Departmental Manager.

| | |
|---|---|
| Area: | Social Development & Community |
| Site: | Waihi |

| | Position/Title | Name | Date |
|---|---|---|---|
| Authored By: | Community Support Officer | Gael Hurley | 7 April 2016 |
| Reviewed By: | Senior Community Advisor | Kit Wilson | 13 April 2016 |
| Approved By: | HSEC Manager | Kerry Watson | 10 November 2016 |

| | Document Name | Document Reference |
|---|---|---|
| Reference Documents | | |
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# Document Issuance and Revision History

Procedure Name: Managing Public Complaints
Document Reference: WAI-800-PRO-007

| Revision No. | Revision Date | Section | Page | Description of Issuance or Revision | Effective Date |
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# Table of Contents


| | | | |
|---|---|---|---|
| 1 | PURPOSE | | 49 |
| 2 | SCOPE | | 49 |
| 3 | RESPONSIBILITIES | | 49 |
| 4 | PROCEDURES | | 51 |
| | 4.1 | Publication of Complaint Management Procedures | 51 |
| | 4.2 | Complaints Overview | 51 |
| | 4.3 | Receiving & Responding to Complaints | 51 |
| | 4.4 | 0800 WAIHIGOLD Calls Received Outside Normal Hours | 52 |
| | 4.5 | 0800 WAIHIGOLD Calls Received by Gatehouse Security | 52 |
| | 4.6 | Investigation & Action | 53 |
| | 4.7 | Noise | 53 |
| | 4.8 | Vibration | 54 |
| | 4.9 | Non-amenity Complaints | 54 |
| | 4.10 | Complaint Resolution | 55 |
| | 4.11 | Access Database and Cintellate | 55 |
| | 4.12 | Reporting | 56 |
| 5 | DEFINITIONS | | 56 |
| 6 | REFERENCES & APPENDICES | | 56 |
| 7 | DOCUMENT CONTROL | | 57 |

## 1 PURPOSE

- To ensure public complaints are managed in a sensitive, timely and consistent manner and to identify corrective actions where appropriate
- To ensure compliance with Martha Mine Extended Project Resource Consents and Conditions, Hauraki District Council 3.4(a)(g), Waikato Regional Council 13.0 Schedule 1, 7.0, and Mining Licence (ML 32 2388).
- To ensure compliance with Correnso Underground Mine Conditions of Consent 80-83.
- To ensure compliance with Slevin Underground Project Area (SUPA) Conditions of Consent 41-45.

## 2 SCOPE

- This procedure relates to all staff at the OceanaGold New Zealand Ltd (OGNZL) Waihi site including the Company Liaison Officer (CLO), the Community Engagement Officer (CEO) and other members of the Community team and Gatehouse Security staff who provide on-call cover for the CLO and are in the position to receive complaints from members of the public.
- A complaint is defined as: An expression of discontent, damage, discomfort, annoyance etc. of an individual or group of people directly or indirectly caused by OGNZL Waihi activities.
- It is important to capture other feedback from the community that is not classified as a complaint. Some people wish to inform OGNZL Waihi of its perceived activities and/or effects and this should be encouraged. Feedback can provide forewarning of aspects that may become issues and / or complaints. This information is to be recorded and monitored in the same manner as complaints.

## 3 RESPONSIBILITIES

| Role | Responsibilities |
|---|---|
| General Manager | • Ensure the Management of Public Complaints is undertaken to ensure compliance with Hauraki District Council & Waikato Regional Council consents and Mining Licence conditions relating to complaints management<br>• Provide sufficient resources to ensure conformance with the requirements of this SOP<br>• Ensure delegation of authority to the CLO to ensure conformance with this SOP including the authority to request the immediate implementation of the noise and/or vibration mitigation process, to stop an activity or item of plant if, in the opinion of the CLO having followed the procedure set out below, such action is required in response to the complaint<br>• Participate in daily review of complaints received<br>• Participate in management reviews to review complaint trends |
| HSEC Manager | • Ensure the Management of Public Complaints is undertaken as required by relevant Hauraki District Council & Waikato Regional Council consent conditions and Mining Licence conditions.<br>• Provide support for the CLO, the CEA and other Community staff in the management of complaints<br>• Participate in daily review of complaints received<br>• Participate in management reviews to review complaint trends |

| Role | Responsibilities |
|---|---|
| Site Services Manager | • Provide support to the complaints management procedure as required particularly with regard to investigation of complaints relating to perceived property damage |
| Senior Community Advisor | • Provide support for the CLO, the CEA and other HSECstaff in the management of complaints<br>• Interviewed on the local radio (Gold FM) once a month on current issues including information on how people may contact the company |
| Company Liaison Officer (CLO) | • Ensure the Management of Public Complaints is undertaken to ensure compliance with Hauraki District Council & Waikato Regional Council consents and Mining Licence conditions relating to complaints management<br>• Ensure CLO contact details are published regularly in local media<br>• Ensure the Community Engagement line is staffed at all times<br>• Ensure complaints received are logged in the daily report and the complaints database<br>• Ensure six-monthly reports are submitted to Hauraki District Council and Waikato Regional Council |
| Community Engagement Officer | • Provide support to the CLO to ensure compliance with Hauraki District Council and Waikato Regional Council consents and Mining Licence conditions relating to complaints management including assisting with providing cover for the Community Engagement line, receiving and logging complaints in the daily report, ensuring the complaints data base is kept up to date |
| Community Team | • Provide support to the complaints management procedure by carrying out rostered on call duties as required |
| Grey Street Gatehouse Security Staff | • Provide support to the complaints management procedure by staffing the 0800 WAIHIGOLD Community Engagement Line outside normal office hours and at other times as may be determined. |
| Senior Environmental Officer | • Support the complaints management procedure by providing monitoring results as requested |
| Environmental Technician | • Carry out noise monitoring as requested in response to a noise complaint |
| Employee | • Ensure general awareness of the complaint management procedure |

# 4 PROCEDURES

## 4.1 Publication of Complaint Management Procedures

- OGNZL Waihi has developed a complaint management procedure that is communicated to the community in a number of ways as follows:

    1. The website www.waihigold.co.nz includes instructions on lodging a complaint with the Company Liaison Officer or delegate.
    2. The Waihi Leader Update that is published once a month includes contact details for the Community Engagement Line.
    3. All communication provided to residents through mail-drops or door-knocking includes contact details for the Community Engagement Line.

The Senior Community Advisor is interviewed on the local radio (Gold FM) once a month on current issues including information on how people may contact the company.

## 4.2 Complaints Overview

- 0800 WAIHIGOLD is a 24/7 staffed telephone line to enable members of the public to notify the company when mining activity is perceived to cause disturbance.
- This immediacy of reporting enables OGNZL Waihi to modify its activity to minimise disturbance. For an event that has occurred, such as a blast, the reporting assists with the planning for future activity. Often an exceedance determines when this takes place however investigation can happen when other trends are identified.
- Complainants should be encouraged to report promptly following a disturbance to allow immediate follow-up to occur or, where this is not possible, provide information for the planning of future mine-related activity. (Multiple historical complaints are addressed in 4.3).
- Anonymous complaints will not be deemed complaints. Complainants who wish to remain anonymous will be advised that their personal details can remain confidential (i.e. known only to the HSEC department). If they still wish to remain anonymous the matter will be logged as a concern and not responded to.

## 4.3 Receiving & Responding to Complaints

- The CLO is the first point of contact for any member of the public (stakeholder) making a complaint.
- CLO contact details are made available as follows: Waihi Leader Update (every month), on the www.waihigold.co.nz website and in consultation material.
- Complaints are received via the company community engagement phone. Any calls received at reception through the main switchboard will be transferred to the community engagement phone.
- The CLO or delegate will attend the 0800 WAIHIGOLD Community Engagement Line during normal office hours.
- Complaints received via the 0800 WAIHIGOLD Community Engagement Line outside normal office hours will divert to a recorded message which will advise the caller to leave a message for non-urgent issues which can be attended to next business day. For any issue requiring an immediate response the call will be answered by Gatehouse Security staff. (See 4.4)
- Complaints received through HDC and WRC are also logged.
- If contractors or staff receive a complaint from a stakeholder, the complainant should be advised to contact the CLO or delegate on the free phone number 0800 WAIHIGOLD / 0800 9244444. This requirement is communicated to all OGNZL Waihi employees and contractors during the General Site Induction.
- If security staff at the Grey Street or Baxter Road gatehouse receives a complaint during normal office hours the complainant should be advised to contact the CLO or delegate on 0800 WAIHIGOLD.
- Complainants must be treated politely and with sensitivity.

- If a complainant becomes abusive about an issue the CLO or delegate should politely bring the conversation to an end and advise the caller that they will phone them back in a specified time (e.g half an hour or the next day) to allow them time to regain their composure. If abusive behavior continues the complainant will be advised in writing that in future they will need to lodge any complaints with HDC as we will no longer respond to their calls. The caller's name will be added to a 'caution' list for internal purposes – which will also be communicated to Hauraki District Council's Manager of Planning & Environmental Services.
- Multiple historical complaints will be logged if they have occurred during the current calendar month. It is difficult to add new complaints after the end of month reporting deadline and does not assist OGNZL Waihi to minimise its perceived disturbance within the community. Complaints that relate to events prior to the current calendar month will be logged as a concern and not responded to.
- All complaints are recorded on the Complaints form (WAI-800-FOR-001-0).
- The form prompts the CLO or delegate to record necessary information (such as the cause of the complaint and any mitigating actions that were taken to address the issues identified) as per the consent condition and Mining Licence conditions. It is important to get as much information as possible to enable an effective investigation to occur.
- In the event a complaint is received that is found not to be related to OGNZL Waihi activities, the details will be captured and reported at the daily meeting. Despite the complaint not being attributable to OGNZL Waihi activities it will be documented as a complaint with an explanation outlining investigation findings.
- Thank the complainant and ask them if they would like to be advised of any monitoring results.
- If the complainant does want to be informed of monitoring results indicate that they will be notified as soon as the complaint has been investigated and notified of what action will be/has been taken (if any). Issues that could seriously affect the running of the operation are reported to the General Manager or his designate.

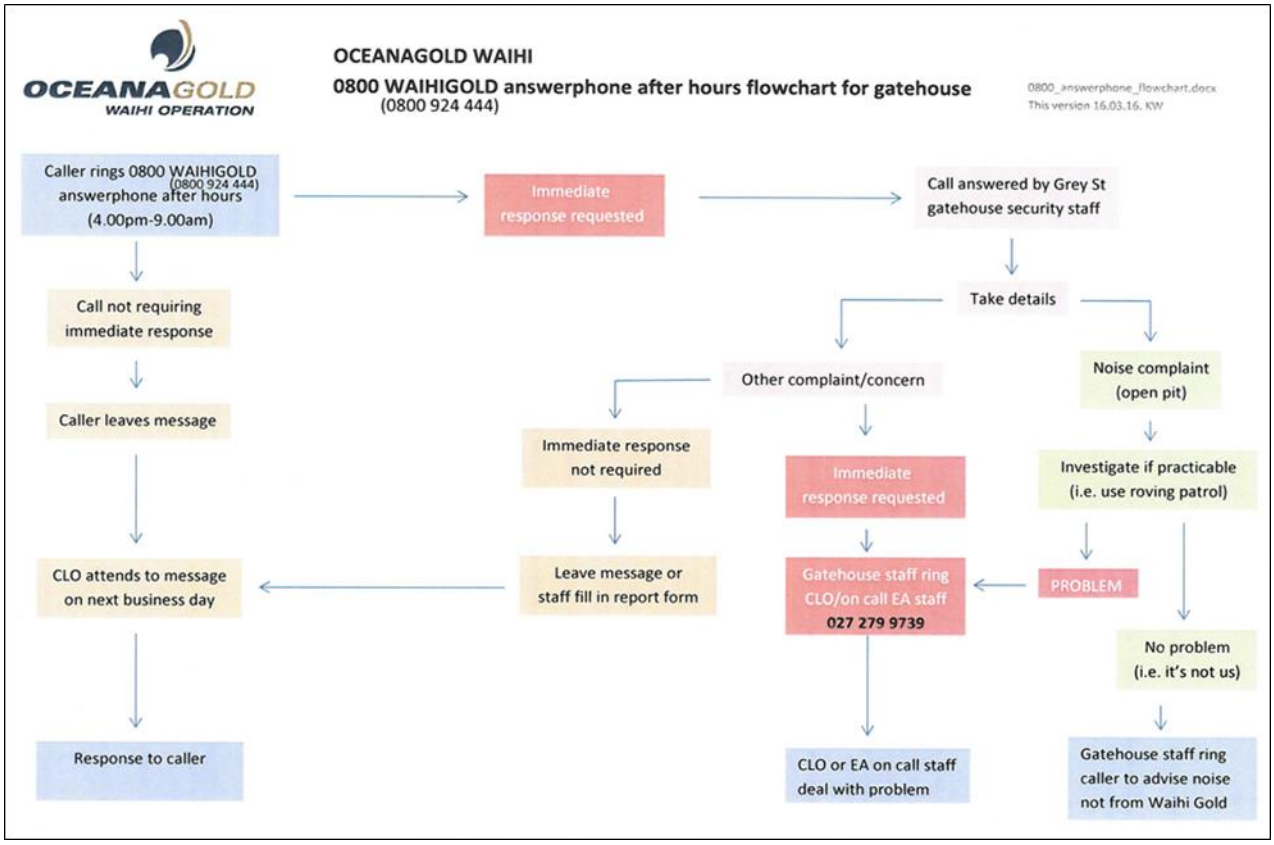
## 4.4 0800 WAIHIGOLD Calls Received Outside Normal Hours

- Outside normal office hours callers to 0800 WAIHIGOLD will receive a recorded message:
- *Welcome to the Waihi Gold Community Engagement Line. This phone is attended x.xx am to y.yy pm each weekday. If you are calling outside these hours please leave a message. A staff member will get back to you on the next working day. If you are calling about an issue which requires an immediate response such as a noise complaint please press 1.*
- Caller leaves a message and issue is dealt with by the CLO or delegate next business day as per 4.6.
- 'Press 1' connects the caller to Gatehouse Security.
- If the call is genuine and requires an immediate response (e.g noise issue in open pit) Security staff ring CLO or Community team staff member on call.
- If call does not require an immediate response security staff log call and hand details to CLO or delegate to be dealt with next business day.

## 4.5 0800 WAIHIGOLD Calls Received by Gatehouse Security

- Noise complaints received by Gatehouse Security Guards should be investigated as soon as practicable by the roving guard.
- If it is found that the source of the noise is from OGNZL Waihi's operations the complaint must be referred immediately to the CLO or EA staff member on call.
- Noise complaints that are not related to OGNZL Waihi operations should be logged and details forwarded to the CLO or delegate who will attend to the complaint the next business day.
- Complaints regarding any other issues should be logged and details forwarded to the CLO or delegate who will attend to the complaint the next business day.
- All complaints are recorded on the Complaints form (WAI-800-FOR-001-0).

- The form prompts the recording of necessary information as per the resource consent and Mining Licence conditions. It is important to get as much information as possible to enable an effective investigation to occur.
- Complainants must be treated politely and with sensitivity.
- If a complainant becomes abusive about an issue, suggest they ring back later.
- At the conclusion of the call thank the complainant and ask them if they would like to be advised of any monitoring results.
- Prank or malicious calls should be ignored. Hang up immediately.
- The CLO or designate will meet with new Gatehouse Security staff to advise of the most effective ways of dealing with complaints and address any issues staff may have.
- Specific details of complaints received must not be discussed with anyone outside of the OGNZL Waihi Community Department.
- The steps outlines in the flowchart below must be followed for complaints received by gatehouse staff.




## 4.6 Investigation & Action

- The complaint will be investigated and an action or response decided upon.

## 4.7 Noise

- Noise complaints are followed up immediately if reasonable to do so (within an hour of the complaint being received or at the same time the next day).

- The HSEC Manager and/or Environmental Technician is informed and a decision is made to measure the noise if practicable (e.g. noise monitoring may not be practicable if the wind speed is greater than 5.0m/sec).

## 4.8 Vibration

- Vibration complaints are checked by accessing Blast Hub
- Exceedances are required to be investigated in more detail and a response from the mining department recorded as to what mitigation action is planned. Maximum permitted levels are:
    - Martha: 5 mm/s;
    - Correnso: The peak particle velocity (vector sum) shall be no more than:

        i) For development blasts

        4. 5mm/s for 95% of the monitored events
        5. 2mm/s on average

        ii) For production blasts

        6. 5mm/s for 95% of the monitored events
        7. 3mm/s on average

    - SUPA: The peak particle velocity (vector sum) shall be no more than:

        iii) For development blasts

        8. 5mm/s for 95% of the monitored events
        9. 2mm/s on average

        iv) For production blasts

        10. 5mm/s for 95% of the monitored events

        11. 3mm/s on average

- A written explanation of vibration exceedances is provided to HDC by the Mining Manager.

## 4.9 Non-amenity Complaints

- Complaints other than those relating to noise or vibration are investigated by the relevant department depending on the issue.
- Part of the investigation could include a visit to the complainant to discuss the problem, especially if the effect they are feeling is temporary; or if requested, a meeting could be arranged between the complainant and the General Manager, or relevant departmental Manager.
- OGNZL Waihi staff should never visit a complainant alone, both for personal safety and for verification of discussions. In the event a staff member feels uncomfortable due to intimidating behaviour they should remove themselves from that environment immediately. The incident will be reported to their manager and a decision will be made on whether the complainant is added to the ‘caution’ list. The complainant will be advised in writing that their behaviour was felt to be inappropriate. If the complainant must be visited in future EA staff will be accompanied by appropriate persons (e.g manager, security).
- Complaints received about OGNZL Waihi staff behaviour will be referred to the Human Resources Manager for investigation. If a complaint is received about contractor behaviour the appropriate manager will be included in any investigation.

- The CLO or the Community Engagement Officer should be present at any meeting that relates to community complaints.
- It is important to record on the form the decision for internal corrective or preventive action and the response made to the complainant.
- Follow-up may be required to determine if an action was effective. This will depend on the issue and agreed time-frame to carry out the action.
- All actions relating to complaints are managed through the complaints database system.

## 4.10 Complaint Resolution

- First Order: It is anticipated that complainants will contact the CLO in the first instance. If, for any reason, they are dissatisfied with the response by the CLO. The CLO and/or General Manager (or delegate) may meet with the complainant to discuss the complaint and ways in which the issue can be resolved. If the parties cannot agree on a resolution, OGNZL Waihi can suggest taking the complaint to the regulators or IRP where relevant (refer OGNZL Waihi Property Programme SOP).
- Second Order: If the complainant chooses to escalate the complaint they may then contact the Manager Planning and Environmental Services or any other Officer of either the Hauraki District Council or the Waikato Regional Council to provide independent mediation.
- Third Order: If the complainant believes the matter is still unresolved they should be directed to the district court, where a decision will be binding on both parties.
- Complaints relating to amenity effects such as noise or vibration will be logged and monitored. If the noise or vibration level is found to be in compliance with consent and Mining Licence conditions the complainant will be advised and the complaint will be considered to be resolved.
- If a noise complaint is monitored and the noise level found to be out of compliance with consent conditions the complainant will be advised of the noise level and the procedure outlined in the Noise Mitigation Plan will be followed to bring the operation back into compliance. Noise monitoring will continue and once compliance has been achieved the complainant will be advised and the complaint will be considered to be resolved.
- In the event that a blast causes a vibration exceedance the relevant OGNZL Waihi Manager is required to provide a written explanation to Hauraki District Council outlining the cause of the exceedance and how this could be avoided in future. The complainant will be advised of this and the complaint will be considered to be resolved.
- The management of complaints relating to non-amenity issues such as perceived property damage or inappropriate staff or contractor behavior will follow a similar process. Mitigating or investigation actions will be discussed with the complainant. Once these actions have been addressed the outcomes will be communicated to the complainant. If they do not wish to escalate the complaint it will be considered to be resolved.
- OGNZL staff who have authority to resolve complaints are primarily the Company Liaison Officer and the Community Engagement Officer.
- All additional Community team personnel will have delegated authority when they are in possession of the Community Engagement phone while on-call or providing cover for staff absences.
- Any member of the site management team has authority to resolve complaints in consultation with the Community team.
- The site will be advised that complaints have been closed out through the daily meeting with the site management team.

## 4.11 Complaints Database and InViron

- Once the complaints form is completed the information is entered into the Complaints Database for reporting and analysis purposes at a later date. The complaints form is available from the database managed by the CLO and is included in this SOP as an appendix.
- Complaint records are also entered into the InViron database.

- It is important that records are complete, accurate, and brief where possible (details are still available on the hardcopy). The complaints form should be filled out to capture as much relevant information as possible.
- The majority of complaints received by OGNZL Waihi relate to amenity issues that are dealt with immediately such as noise and vibration and corrective actions are not generated.
- Where a complaint cannot be resolved immediately, such as issues relating to property, corrective actions will be entered into InViron for tracking as well as the Complaints Database for reporting purposes.

### 4.12 Reporting

- Complaints are communicated by the HSEC Manager (or delegate) at the daily production meeting, as well as the site weekly and monthly reports.
- Complaint trends are presented and reviewed by the site management team at management reviews.
- The CLO is required to provide six-monthly reports with regard to the Martha and Correnso operations to Hauraki District Council and Waikato Regional Council that include the following information:
    - all complaints received during the previous six-month period;
    - action taken by the consent and Mining Licence holder and the resolutions if any;
    - other matters of concern raised by the community;
    - any mediation entered into by the consent and Mining Licence holder and others with respect to operational matters and the outcome (unless parties have agreed to keep such matters confidential).

## 5 DEFINITIONS

| Term | Description |
|---|---|
| CLO | Company Liaison Officer |
| CEA | Community Engagement Officer |

## 6 REFERENCES & APPENDICES

| Item | Title | Location |
|---|---|---|
| Plan | Martha Mine Noise Mitigation Plan | Sharepoint |
| Form | Complaints & Concerns Form | Sharepoint |
| | Hauraki District Council Land Use Consents Extended Project | Sharepoint |
| | Waikato Regional Council Consents Extended Project | Sharepoint |
| | Trio Underground Mine Consents | Sharepoint |
| | Favona Underground Mine Consents | Sharepoint |
| | Correnso Underground Mine Consents | Sharepoint |
| | SUPA Underground Mine Consents | Sharepoint |
| | Mining Licence (ML 32 2388) | Sharepoint |

# 7 DOCUMENT CONTROL

| Author | Reviewer | Change | Date |
|---|---|---|---|
| G Hurley | A Durie | Updated to reflect current situation, including resolution of complaints, dealing with abusive complainants, ensuring personal safety. | 6 Sept 13 |
| K Wilson | A Durie | Change to procedure regarding answering of Community Engagement Line | July 2014 |
| D. Crawford | K.Watson | Update procedure to include SUPA. | November 2016 |