

Mt Coot-tha Quarry Affected Residents

To whom it may concern,

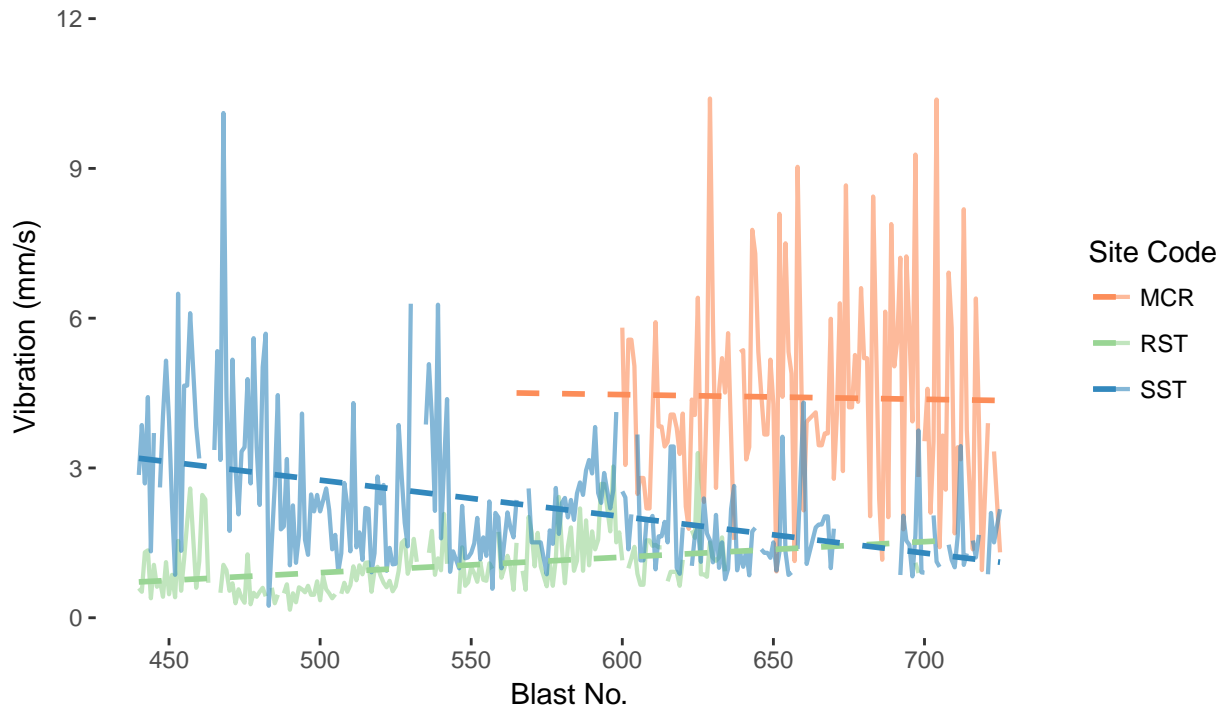
I have been asked by Philip Best (PB) of the Mt Coot-tha Quarry Affected Residents to express a statistical opinion on the spreadsheet as supplied by PB containing the Brisbane City Council (BCC) owned and operated Mt Coot-tha Quarry (MCQ) blast vibration monitoring data, for the 16 years from January 2001 until March 2017 and which he obtained from the RTI departments of the QLD EHP and the BCC.

I have been advised by PB, that prior to Nov-2011 (around blast 600) that the BCC MCQ did not measure the blast vibration levels at the private homes directly opposite and closest to their blast zone. PB also advises that these private homes are fully approved and certified by the BCC, who also recently approved the material change of use to residential for some of this land.

We are also advised by PB that in Nov-2011 (around blast 600), the DERM (now DES) instructed (after requests by residents) the MCQ to begin monitoring near the closest homes, instead of at the much further away location of Sussex Street & Richer St. This resulted in a new monitoring point being setup at the location 159 Mt Coot-tha Rd (159MCR) and permanent monitoring began there at blast 600.

Having the 3 monitoring sites running simultaneously allows us to compare vibration measurements between them. We can see from this period in figure 1., that the closer site 159MCR does indeed present a much higher vibration reading than the 2 more distant sites with longer monitoring periods.

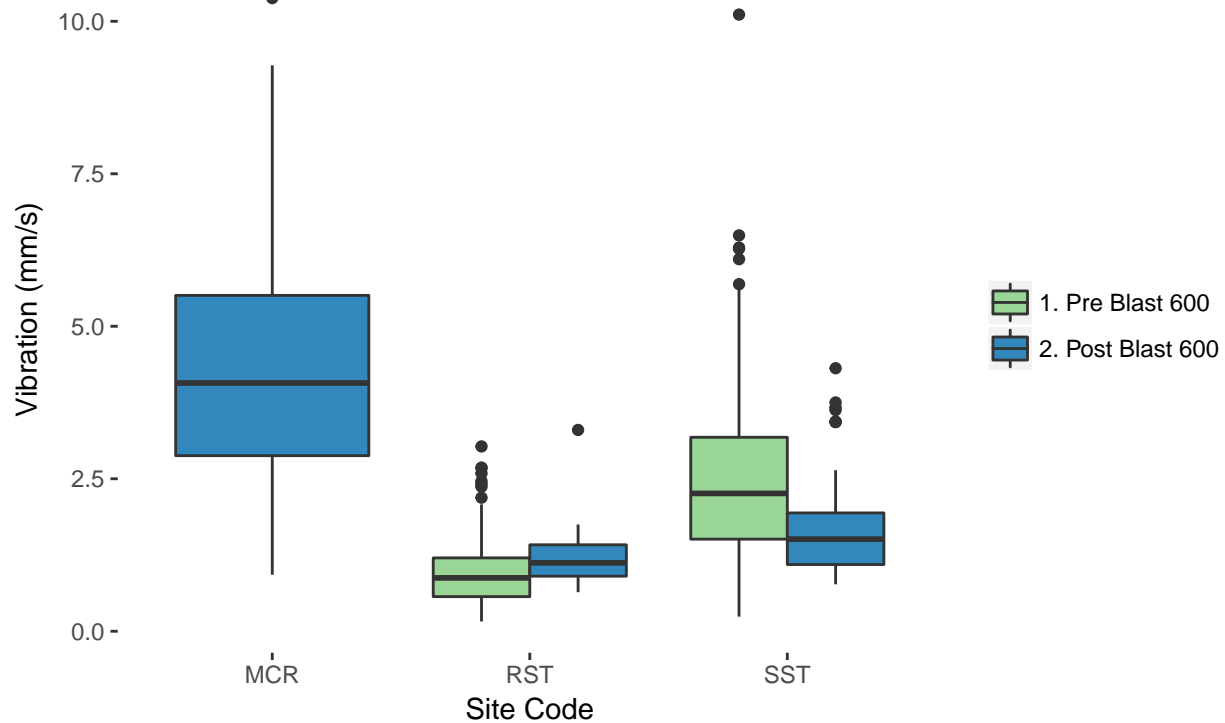
Vibration monitoring results by Blast No.



Furthermore, we can see that the vibration measurements of the SST location have been reducing over time (figure 2. + table 2) as compared between pre and post blast 600.

If we were to use this fact to extrapolate the MCR location readings into the prior period of blasts, say 440 - 500, it would suggest that these would have been even higher during this earlier period.

Box Plot Comparison between Sites Pre and Post Blast 600



| Locn | Period | Min | Q1 | Median | Mean | Q3 | Max |
|------|-------------------|------|------|--------|------|------|-------|
| MCR | 2. Post Blast 600 | 0.93 | 2.88 | 4.07 | 4.36 | 5.51 | 10.40 |
| RST | 1. Pre Blast 600 | 0.16 | 0.57 | 0.88 | 1.00 | 1.20 | 3.03 |
| RST | 2. Post Blast 600 | 0.64 | 0.90 | 1.12 | 1.18 | 1.42 | 3.30 |
| SST | 1. Pre Blast 600 | 0.24 | 1.51 | 2.26 | 2.60 | 3.18 | 10.11 |
| SST | 2. Post Blast 600 | 0.77 | 1.09 | 1.51 | 1.64 | 1.94 | 4.31 |

It is evident from this data that the readings at the MCR site are higher in average and median than both periods; prior and post blast 600 from the other 2 sites.

Therefore, using the Richer St and Sussex St site readings to report the MCQ blast vibration footprint to the relevant regulatory authorities would lead to a misrepresentation of the true vibration experienced by residents in the vicinity of the 159MCR site. This appears to have been the case over a period of several years. In the latter period the misrepresentation is an under-representation of the actual median vibration strength experienced in the order of 2.6x to 3.6x based on the data provided.

All the best,

Clancy Birrell
 BSc(Maths), MSc(Stats) (Cand)
 Principal, Data Science & Analytics