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Preventing the Potentially Deadly Consequences of Flyrock: Mandatory Minimum Setbacks and Separation Distances Required

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Updated Flyrock Distances Where Distance From Blast Site Known (June 2013)

A non-theoretical *quantitative* study of actual distances flyrock has been launched from a blast site was undertaken by Sevelka (May 2021) and included in that analysis are 92 incidents of flyrock. Since then, more incidents of flyrock have been documented, expanding the data set from 92 to 136 incidents of flyrock (June 2023). Where flyrock debris has been launched over a large area or in more than one direction, only the furthest distance of the flyrock from the blast site is recorded, summarized and arrayed in the following bar chart.

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The number of flyrock incidents within each interval, starting at between 0-99 metres, and the average distance travelled within each interval are summarized in table 1 below.

Table 1

<table>
<thead>
<tr>
<th>Metres</th>
<th>0-99</th>
<th>100-199</th>
<th>200-299</th>
<th>300-399</th>
<th>400-499</th>
<th>500-599</th>
<th>600-699</th>
<th>700-799</th>
<th>800-899</th>
<th>900-999</th>
<th>1000-1099</th>
<th>1100-1199</th>
<th>1200-1299</th>
<th>1300+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidents</td>
<td>9</td>
<td>17</td>
<td>29</td>
<td>12</td>
<td>9</td>
<td>10</td>
<td>2</td>
<td>11</td>
<td>3</td>
<td>6</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Cumulative</td>
<td>-</td>
<td>26</td>
<td>49</td>
<td>78</td>
<td>90</td>
<td>99</td>
<td>109</td>
<td>111</td>
<td>122</td>
<td>125</td>
<td>131</td>
<td>131</td>
<td>136</td>
<td>139</td>
</tr>
<tr>
<td>Average (m)</td>
<td>59</td>
<td>148</td>
<td>240</td>
<td>327</td>
<td>440</td>
<td>512</td>
<td>616</td>
<td>701</td>
<td>803</td>
<td>916</td>
<td>1015</td>
<td>-</td>
<td>1225</td>
<td>2307</td>
</tr>
<tr>
<td>% of Total</td>
<td>6%</td>
<td>12%</td>
<td>17%</td>
<td>21%</td>
<td>9%</td>
<td>6%</td>
<td>7%</td>
<td>1%</td>
<td>8%</td>
<td>2%</td>
<td>4%</td>
<td>0%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Cumulative %</td>
<td>-</td>
<td>19%</td>
<td>35%</td>
<td>56%</td>
<td>65%</td>
<td>71%</td>
<td>78%</td>
<td>80%</td>
<td>88%</td>
<td>90%</td>
<td>94%</td>
<td>94%</td>
<td>98%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The following analysis is based on the data summarized in table 1:

- An analysis of 139 flyrock incidents, where the distance from the blast site is known, indicate that 94% (131) of the flyrock incidents occurred within 1,099 metres, and 98% (136) occurred within 1,299 metres.
- At 90%, of the 139 flyrock incidents, 125 flyrock incidents in ascending order reached a distance up to the 900 – 999 metre interval, and, at 94%, which accounts for the first 131 flyrock incidents in ascending order, flyrock reached a distance up to the 1000 – 1099 metre interval.
- At 98%, of the 139 flyrock incidents, 136 flyrock incidents in ascending order reached a distance up to the 1200 – 1299 metre interval.
- On the basis of the this updated study of flyrock incidents (August 2023), the designated blast area (onsite safety zone) would have to be approximately...
1,000 metres to effectively prevent 94% of flyrock incidents from leaving the boundaries of a blasting quarry site, equivalent to a 1,000-metre setback.