

ALLSTONE DIMENSION ROCK QUARRY DISTRICT COMMISSION #
Chester, Vermont APPLICATION # 2.50775-1

EXHIBIT # 16
DATE: 7/20/04

Quarry Development and Reclamation Plan

The Allstone quarry will involve an 11 acre expansion of an existing dimension stone quarry on a 300+ acre parcel. The existing quarry, approved under Act 250 is located approximately 2,900 feet to the northwest of the proposed quarry. The existing quarry involves approximately 2 acres and will be phased out of production over two years as the new quarry is developed. The new quarry will be developed in four phases. Each phase will be approximately 2 - 3 acres in size. The overall quarry development will include the extraction of the approximately 1.2 million cubic yards of overburden and rock throughout the life of the quarry. The average annual production for the quarry will be 60,000 yd.³ over the 20-year life of the project. This rate of production will result in an average of seven tractor-trailers and seven ten-wheel dump trucks on a daily basis. It is anticipated that an additional five pickup and small dump trucks will access the site on a daily basis when the quarry is in full production.

The hours of operation will be from 7 a.m. to 5 p.m. six days a week with no blasting or drilling on Saturdays. The quarry will operate year-round with the winter operations anticipated to be at a rate of 25% to 50% of the summer production rates.

Stone processing and splitting will be performed in a 24' x 20' portable shelter in the eastern portion of Phase I in the earlier stages of the quarry development. As quarry development progresses to other phases the portable shelter will be relocated closer to the working area for more efficient operations.

Prior to commencement of quarry operations the up-slope surface water diversion swales, will be constructed above and generally south of the quarry site. These swales will be constructed in phases with the western portions constructed at the start of operations and the eastern portion constructed prior to quarry operations commencing downhill of that portion of the quarry.

As can be seen from the site development sketch the project will include progressive development of the phases 1 through 4 over the life of the quarry. The phases will be developed, in general in a northwest to southeasterly orientation to accommodate the most efficient extraction of the rock along its longitudinal axis. The quarry will be developed in a series of lifts approximately 30 feet high. As the quarry develops throughout the site, the final contours will slope generally from south to the north in the base of the quarry. In the rear (southern end of the quarry) will be two 25' wide benches, which will be stabilized with a light application of loam and will be seeded as work has finished on each bench.

Although it is anticipated that some groundwater will seep from the bedrock within the working areas of the quarry this water will be diverted to the stormwater sedimentation

basins for treatment. This minimal flow will have no adverse impact on the operation of the sedimentation basins.

A small portion of the rock removed (10-20%) during the quarry operations will be unsuitable for dimension products. This rock will be stockpiled, crushed and used to stabilize the working areas within the quarry or sold for construction. It is anticipated a compact, portable crusher will be brought to the quarry twice a year for approximately two weeks to perform this crushing operation. The crusher will be located behind the screening berm to minimize any potential noise impacts.

It should be noted that all aspects of the operation of this quarry will conform with and be regulated by the US Bureau of Mines Standards for operation of a rock quarry.

The stormwater sedimentation basins, located in each place of the quarry will be constructed as each phase is developed. Temporary surface water diversion swales will be constructed above and within each phase to divert stormwater to the sedimentation basins for treatment.

QUARRY DEVELOPMENT

It is anticipated the start-up of the quarry will require at least two seasons to develop the screening berms, working area and to develop the rock veins for production of the stone. This start up will coincide with the phased closure and reclamation of the existing quarry.

Phase 1

The quarry development will commence in the northwestern corner of the quarry in Phase 1. Phase 1 will be developed generally from the western end and progressing from the north to the south. This will allow extraction of the rock, along its north/south axis. This will require minimal blasting to remove the largest mount of rock from the face at one time. As the goal of this quarry is to produce large, uniform dimensioned stones, which can be used for building walls, window and doorsills and other architectural features, the least amount of disturbance to the rock necessary is desirable. This necessitates the use of the smallest amount of blasting required to release the rock from the ground. The goal is to loosen the rock from the earth and not to shatter the rock, as is the case with a stone quarry producing crushed stone or other aggregate.

Prior to commencing Phase 1, a temporary surface water diversion swale will be constructed up hill of the operational area to divert surface water around the working face toward the quarry sedimentation pond.

Access to Phase 1 will be via the existing logging access road across the Williams River, from Route 103. The access road will require minimal improvements as the existing bridge over the Williams River has been used

historically for log trucks with weight limits in excess of those anticipated in the quarry operation.

Development of Phase 1 will include the construction of 15' high, earth, screening berm, along the northern boundary of Phase I to minimize the potential visual and noise impacts from the development of the quarry. This berm will be constructed from overburden materials removed to uncover the usable stone in the earlier portions of Phase 1. The top and northern side of the berm will be planted with 8' to 10' high evergreen trees to further buffer the potential visual impact of the quarry.

The initial operations in Phase 1 will be from the existing log landing which will provide a generally flat area to start stone processing. The rock face will be developed from the east toward the west as shown on the Site Development Plan. The final base elevation of Phase 1 will be approximately 780' as shown on Cross Section A-A on Sheet C-2.

As quarry development proceeds toward the final grades within Phase 1, site preparation and operations will began in Phase 2. This gradual progression between Phases will be typical of the entire quarry development plan. This minimizes the area exposed a one time but also allows for a blending of the various color stone, which exist on the site, which is necessary from a marketability perspective.

Phase 2

Because of the alignment of the bedrock on the site, Phase 2 will be developed in two areas simultaneously. The first portion of Phase 2 to be developed will be directly south of Phase 1. This portion of Phase 2 will continue the extraction of the stone started in Phase 1 and will proceed generally from the east to the west along rock axis. As this portion of Phase 2 is developed and the Phase 1 area is reclaimed the southeasterly portion of Phase 2 will be developed. This area is an outcrop, which will permit access to the rock with minimal overburden removal. Quarrying will continue in both areas of Phase 2 until this phase is completed.

At the same time, the base area of Phase 1 will be reclaimed as a working area for stone processing. The base of the quarry will be covered with crushed stone to provide a stable base upon which to work and to divert surface water away from the work area. The portable shelter housing the stone processing equipment will be first utilized within this reclaimed Phase 1 area of the quarry. Those Phase 1 areas, which will not be used for processing, will be re-claimed in accordance with the project erosion Control Plan.

Access to Phase 2 will be both from Phase 1 directly and via the quarry work road along the northeastern perimeter of the quarry. This road will serve as both accesses for the eastern areas of the quarry and as a surface water collection swale to divert runoff within the quarry to the sedimentation basin.

Phase 3

Phase 3 will be developed similarly to Phase 2 in both the eastern and western areas of the quarry. The western portion will be a continuation of Phases 1 & 2 developing the base of the quarry to elevation 795'. The final contours within this portion of Phase 3 will include the continued construction of the first bench and the start of the second bench in the southern portion of the quarry. The eastern portion of Phase 3 will surround the earlier development of Phase 2 as shown on the quarry development plans. Access to Phase 3 will be from Phase 2.

Phase 4

The final quarry development will be within Phase 4, generally along the southern boundary of the quarry. The final benches of the quarry will be constructed and stabilized during the completion of Phase 4. Access to Phase 4 will be from Phase 3.

The final contours for the entire quarry are shown in plan view on Sheet C-1 and in cross section on Sheet C-2.

It is anticipated the quarry will be developed generally on the following schedule.

Phase 1	Years	1-3
Phase 2	Years	3-5
Phase 3	Years	5-10
Phase 4	Years	10-20

The anticipated average annual production from the quarry is as follows:

YEAR	PRODUCTION (CY)	AVERAGE TRUCKS/DAY
1	4,000	2
2	9,000	3
3	15,000	4
4	25,000	4
5	30,000	6
6	35,000	7
7	40,000	8
8	55,000	10
9	75,000	12
10	80,000	14
↓	↓	↓
20	80,000	14

Average production over 20 years is 60,000cy/yr
 Trucks will generally be half tractor trailers and half ten-wheel dump trucks

Noise Control

Allstone Inc. has been operating a dimensioned stone quarry for three years on the same property as the proposed quarry. (The existing quarry was operated by the prior owner before this). The existing quarry is directly adjacent to Route 103 approximately 3,000 feet northwest of the proposed project. Although the closest neighbor is only 400 feet from the working quarry there have been no noise complaints related to the existing operation. This is both because of the relative low level of noise emanating from the operation and the high ambient noise associated with Route 103. Route 103 has Average Daily Traffic counts of 5,000 vehicles per day with many of these trucks. The noise levels produced from the proposed quarry are expected to be similar to those produced by the existing quarry.

RSG Noise Report is attached.



MEMORANDUM

To: Greg Adamovitch
From: Kenneth Kaliski, PE, INCE Board Certified
Subject: Noise Standard
Date: 24 May, 2004

In our 10 May 2004 report, we discussed the sound levels we measured from your equipment and the ambient sound level at the homes nearest to the quarry. This letter will add to the information already provided to you, but proposing a noise standard for homes adjacent to the proposed quarry.

There are many types of standards in use across the world today. The most commonly accepted standards for daytime activities incorporate some type of averaging. For example, the FHWA uses the one-hour average, or Leq(1), the US EPA, HUD, and FAA use the day-night average, or Ldn. The World Health Organization uses a 16-hour average, or Leq(16).

The Leq has several advantages. It is easy to measure and to model. It is a pressure weighted average, so it weights loud and infrequent sound more heavily than consistent background sound. For example if we have 10 minute of 70 dBA and 50 minutes of 50 dBA, the Leq(1) is 62 dBA.

Near to the proposed site along VT 103, the Leq(1) ranges from 69 dBA to 71 dBA with an average of 70 dBA (see Figure 5 of our report). All of the closest residences are adjacent to VT 103. In light of this, we would recommend the following standard be applied to any affected residence:

The standard shall be 60 dBA Leq(1) and 70 dBA Lmax.

If the ambient sound level in the absence of the quarry exceeds these levels, then the standard shall be adjusted to be the ambient sound level. For example, if the measured ambient sound level is 65 dBA, the Leq standard is adjusted to 65 dBA. Or, if the ambient Lmax is 75 dBA, the standard is adjusted to 75 dBA.

This standard assumes operation during normal business hours.

The Lmax measurement shall be measured either as a slow response maximum or 1-second Leq.

Only an ANSI or IEC Type I or Type II sound level meter can be used to assess conformance with this standard.

The measurement shall be made outside the affected home.

Noise from trucks and other motor vehicles are exempt when they are operating within 100 meters of any State Highway.

Blast warning horns and other safety-related signals are exempt.

Blast noise (airblast overpressure) is not subject to this standard. However, blast noise must meet the Bureau of Mines standard of 105 dBC (slow response maximum) and other standards as appropriate.

Construction activities and lawn maintenance are exempt so long as they occur during normal business hours





MEMORANDUM

To: Greg Adamovich
From: Kevin Hathaway and Kenneth Kaliski, P.E.
Subject: Summary of Noise Measurements for Allstone, Inc.
Date: 10 May 2004

At your request, we are providing a summary of the sound monitoring conducted by Resource Systems Group on March 24th at your existing quarry on VT 103 in Gassetts, Vermont and across the road from your proposed quarry over a five day period.

MONITORING OF QUARRY OPERATIONS

RSG staff conducted sound level monitoring at the existing quarry on VT Route 103 in Gassetts. The quarry activities that were monitored included the following:

- 1) Hydraulic drill,
- 2) Excavator,
- 3) 70-ton rock splitter,
- 4) Loader moving metal hoppers, and
- 5) Generator and 300-ton rock splitter.

We monitored sound levels for all equipment at the quarry and placed a second sound level meter roughly 1,100 feet away in a residential area on Cavendish Road. A Cesva 310, ANSI Type I integrating sound level meter was used to measure 1/1 octave center frequencies for all operating equipment in the quarry. A Brüel and Kjaer 2238, ANSI Type I integrating sound level meter was used for measurements on Cavendish Rd to the North of the site. Both meters were calibrated before and after the measurements and fitted with windscreens. The weather was mostly sunny, with winds 4-6 mph out of the North, and temperatures in the lower 50s. Figure 1 shows the location of the quarry equipment on the day of monitoring as well as the location of the monitor on Cavendish Road.

Figure 1: Layout of Existing Quarry and Monitoring Location at Cavendish Road



The results of the monitoring are described in the following sections.

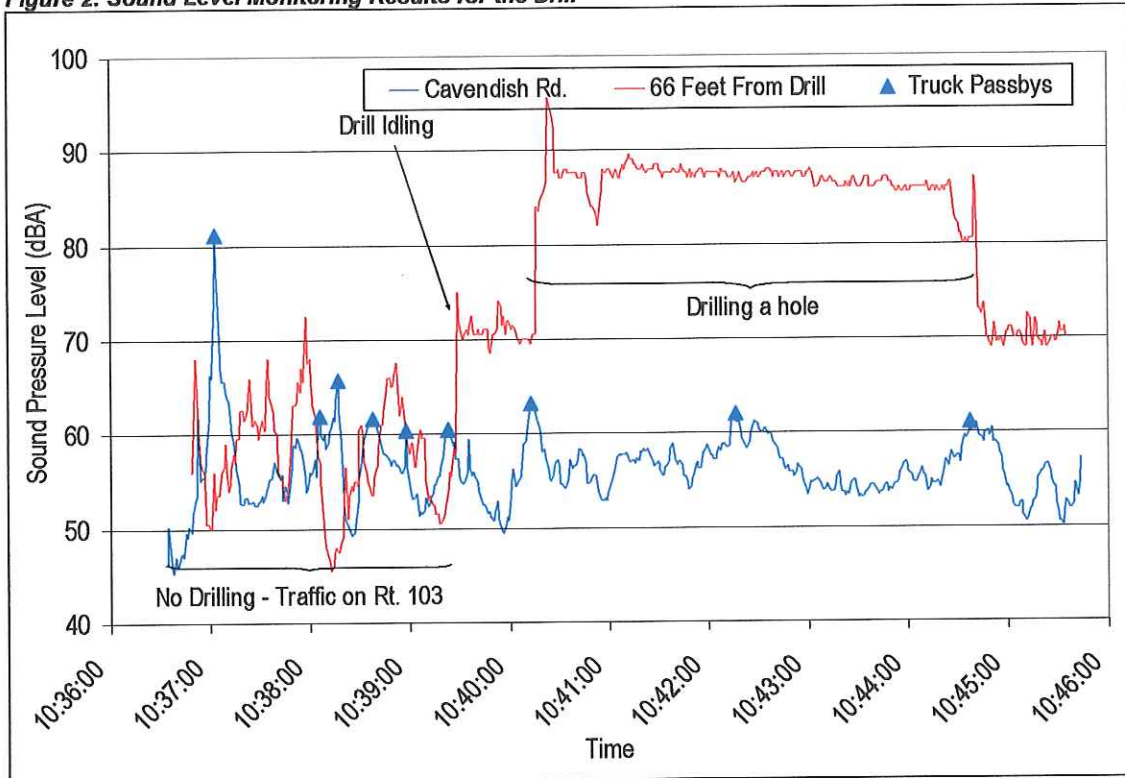
Sound Test #1: Hydraulic Drill

A hydraulic drill was measured at 66 feet for several minutes. The results of this sound test are presented in Figure 2 below. The sound level meter recorded just over two minutes of background sound and then the drill was turned on, indicated by the sharp increase in sound levels measured near the drill (red line). At the same time, another sound level meter was recording sound levels 1,100 feet away on Cavendish Road. The rise and fall of sound levels at both monitors when there was no drilling was due to passing traffic on VT 103.

Upon the drill beginning, the loudest sound levels were recorded. This is due to the drill bit penetrating the rock surface. As the drill gets deeper into a hole, the levels slowly drop accordingly, represented by a gradual decline in the red line. The meter at Cavendish Road experienced a small rise in overall sound levels during drilling and the observer noted the drilling to be 'clearly audible'. However, the traffic noise from VT 103 continued to dominate noise at this location. By examining the blue line closely, we can see that the 'valleys' are generally higher during the drilling indicating an overall rise in the ambient sound level.



Figure 2: Sound Level Monitoring Results for the Drill

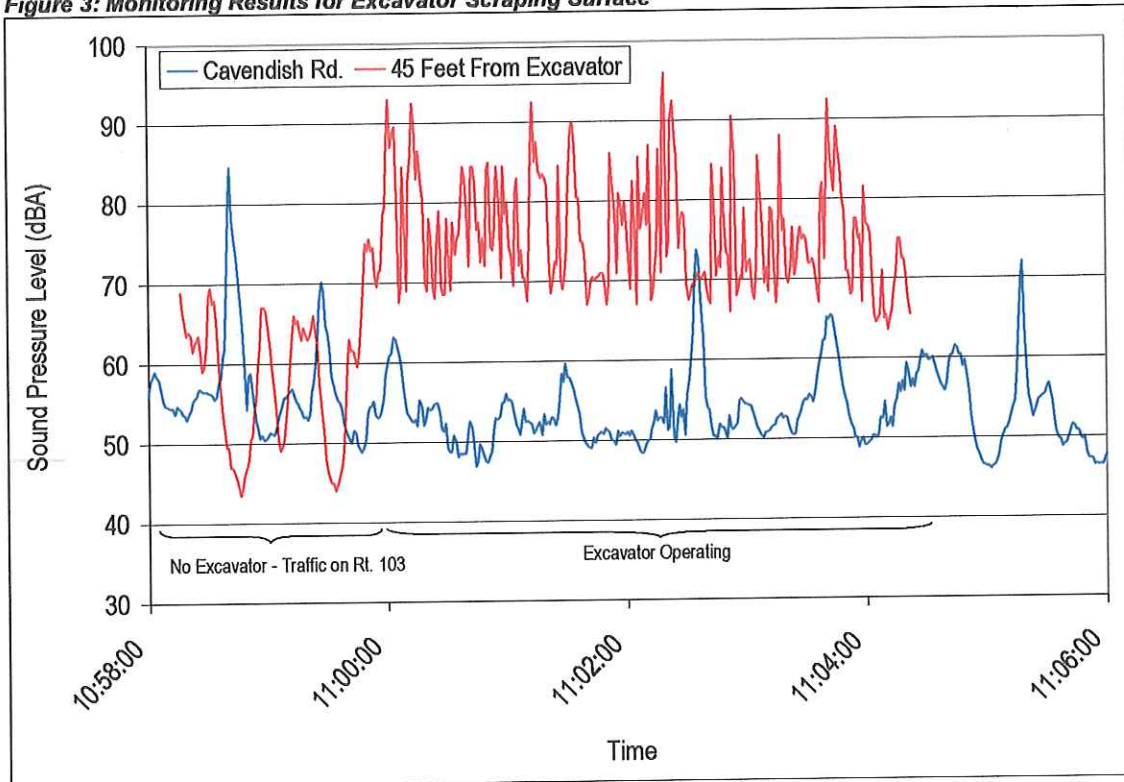


Sound Test #2: Excavator Operating on Surface Rock

We recorded sound levels for an excavator operating for several minutes. We observed the excavator bucket scraping loose rocks at the surface, swiveling the bucket, and moving. Similar to the drilling test, background sound levels were recorded for several minutes prior to the operation of the excavator. Figure 3 shows the results of the sound monitoring. This quarry activity includes noise from the engine, a backup alarm, and the impulsive noise from the bucket picking up and moving quarry debris. In Figure 3, no rise in overall sound levels was experienced at the Cavendish road monitor, though the observer noted the operations to be 'clearly audible'.



Figure 3: Monitoring Results for Excavator Scraping Surface



Sound Test #3: 70-ton Rock Splitter

A Mason 70-ton rock splitter was measured at 34 feet for several minutes. The operation of this piece of equipment includes idling with short impulsive periods of noise during the splitting of rock. The monitor at Cavendish Road did not experience any rise in sound levels and the observer there noted that the splitter was not audible. Tables 1 to 3 at the end of this section summarize the sound levels from this quarry activity.

Sound Test #4: Loader Moving Metal Hoppers

We measured a small loader with a forklift attachment picking up and moving metal hoppers filled with split rock. Noise from this operation includes engine noise, backup alarms, and the loader's steel banging the hopper. There was no rise in overall sound levels at Cavendish Road during this measurement and the observer there noted that the loader was not audible. Tables 1 to 3 at the end of this section summarize the sound levels from this quarry activity.



Sound Test #5: Generator and 300-ton Rock Splitter

A second rock splitter (300-ton hydro-split) was measured at the quarry that included the energy supply of a diesel generator (Olympian 50 kW). Because the splitter is only operated when the generator is running, these two sources of noise are summarized together for the purposes of this memorandum, though they have individual sound characteristics. Sound levels from this quarry activity include continuous engine noise from the generator and impulsive periods when splitting rock. There was no rise in overall sound levels at Cavendish Road, but the observer noted occasional faint quarry noise. Tables 1 to 3 summarize the sound levels from this quarry activity.

SUMMARY OF QUARRY ACTIVITIES

Table 1 summarizes the monitoring with the sound levels adjusted to 50 feet for comparison. Both L10s and maximum one-second Leqs are presented here. L10s describe the sound level that is exceeded 10% of the time. This statistic is useful for removing the short impulsive spikes of a noise source. The Leq levels are the sound level "equivalents" or averages for that noise source. For these Leqs, we have presented 1-second maximums to show the loudest observed event during the monitoring period.

Table 1: Summary of Quarry Activities Observed and Adjusted to 50 feet (Presented as L10s and Leqs)

Equipment Activity Observed	Pre and Post Calibration	Measurement Distance (feet)	L10 (dBA)	L10 Adjusted to 50 Feet (dBA)	Leq _{1-sec} MAX (dBA)	Leq _{1-sec} MAX Adjusted to 50 Feet (dBA)	Audible at Cavendish Rd?
Hydraulic Drill Penetrating Rock	Yes	66	88	90	96	98	Yes, Clearly Audible
Excavator Scraping Surface Rock	Yes	45	86	85	96	95	Yes, Audible
Mason 70-ton Splitter	Yes	34	79	76	94	91	No
Loader Moving Metal Hoppers	Yes	65	78	80	92	94	No
Generator & Hydrosplit 300-ton Splitter	Yes	50	81	81	99	99	Yes, Occasional

Tables 2 and 3 show the overall Leq and Leq_{1-sec} maximum (L_{max}) levels by octave band for sound pressure and sound power, respectively. The overall Leq levels represent the entire monitoring period for that source.



Table 2: Full Octave Sound Pressure Levels (Lp) for Quarry Activities Observed at 50 feet (in dBA)

Equipment Activity Observed		1/1 Octave Center Frequency (Hz)									Total Sound Level
		31.5	63	125	250	500	1k	2k	4k	8k	
Drilling Holes for Blasting	Leq	41	56	69	77	85	82	82	83	79	90
	Lmax	39	53	67	81	85	84	92	95	91	98
Excavator Scraping Surface Rock	Leq	33	52	60	67	76	77	76	68	54	82
	Lmax	46	61	67	80	88	92	90	84	67	95
Mason 70-ton Splitter	Leq	28	43	58	64	73	72	68	61	53	76
	Lmax	28	49	71	79	87	87	82	71	61	91
Loader Moving Metal Hoppers	Leq	40	65	70	65	67	74	75	71	59	79
	Lmax	34	64	73	66	65	80	93	89	78	95
Generator & Hydrosplit 300-ton Splitter	Leq	25	50	62	65	70	82	76	73	64	84
	Lmax	26	51	66	73	80	98	90	87	80	99

Table 3: Full Octave Sound Power Levels (Lw) for Quarry Activities Observed (in dB¹)

Equipment Activity Observed		1/1 Octave Center Frequency (Hz)									Total Sound Level
		31.5	63	125	250	500	1k	2k	4k	8k	
Drilling Holes for Blasting	Leq	111	113	118	120	122	115	114	115	114	126
	Lmax	110	111	116	123	122	117	123	127	125	132
Excavator Scraping Surface Rock	Leq	104	110	109	110	112	110	108	100	88	118
	Lmax	117	118	115	122	124	124	121	115	102	130
Mason 70-ton Splitter	Leq	99	101	107	106	109	104	100	92	87	114
	Lmax	99	107	120	122	123	120	114	102	96	128
Loader Moving Metal Hoppers	Leq	111	123	119	107	104	106	106	102	93	125
	Lmax	105	121	121	108	101	112	125	121	113	129
Generator & Hydrosplit 300-ton Splitter	Leq	95	108	110	107	107	115	108	104	99	118
	Lmax	96	109	114	115	116	130	121	119	114	131

LONG-TERM MONITORING NEAR PROPOSED QUARRY

Resource Systems Group staff placed a sound level meter roughly 65 feet from VT 103 on the east side of the road. This location represented a similar distance away from VT 103 as many other adjacent homes in this area. The monitor was set to record 1-minute Leqs, L90s, L50s, L10s, Lmins, and Lmaxs over a five-day period. Figure 4 shows the location of the monitor and the proposed quarry across the road. The results of the monitoring are presented in Figures 5 and 6. Figure 5 shows LAeq levels for the monitoring period and Figure 6 shows the L90 levels. Both graphs show the anticipated rise and fall of overall sound levels from day to night, respectively. VT 103 is a heavily traveled road for heavy trucks, which contributes to the relatively high daytime sound levels.

¹ Note that the sound power values are in dB and NOT dBA. Sound power is often presented as un-weighted.



Figure 4: Location of the Long-term Sound Level Monitoring and Proposed Quarry

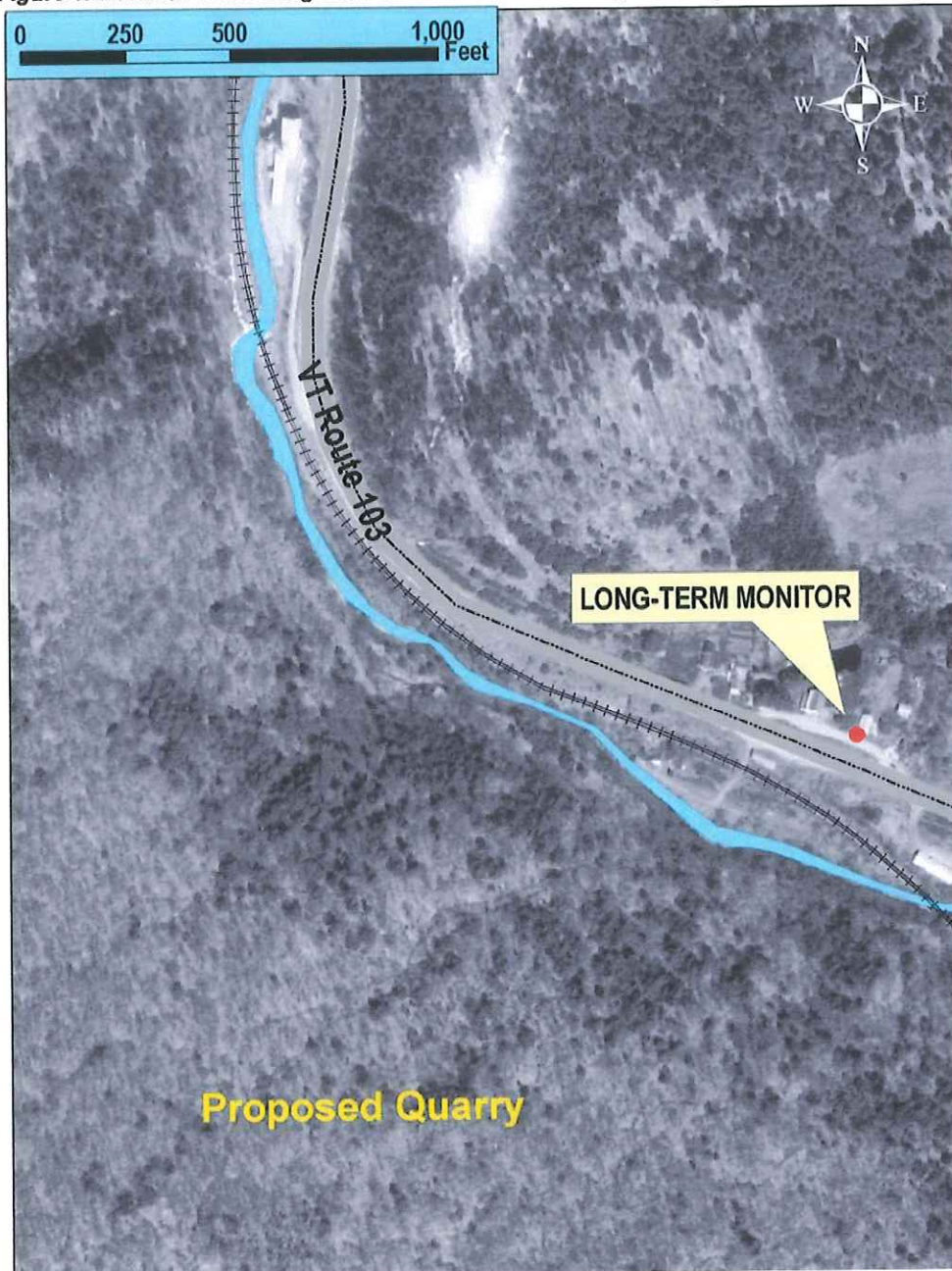


Figure 5: Long-term Monitoring Results (presented as LAeq) Near a Residential Home on VT 103

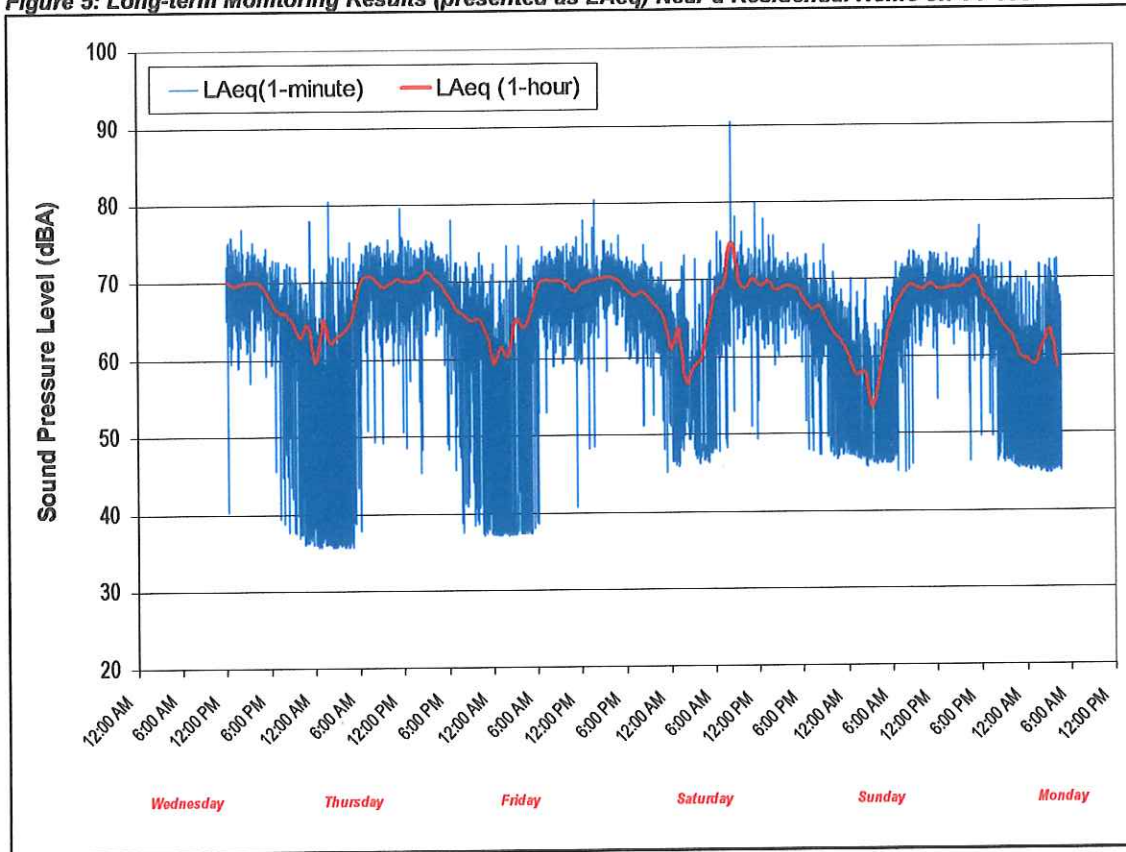
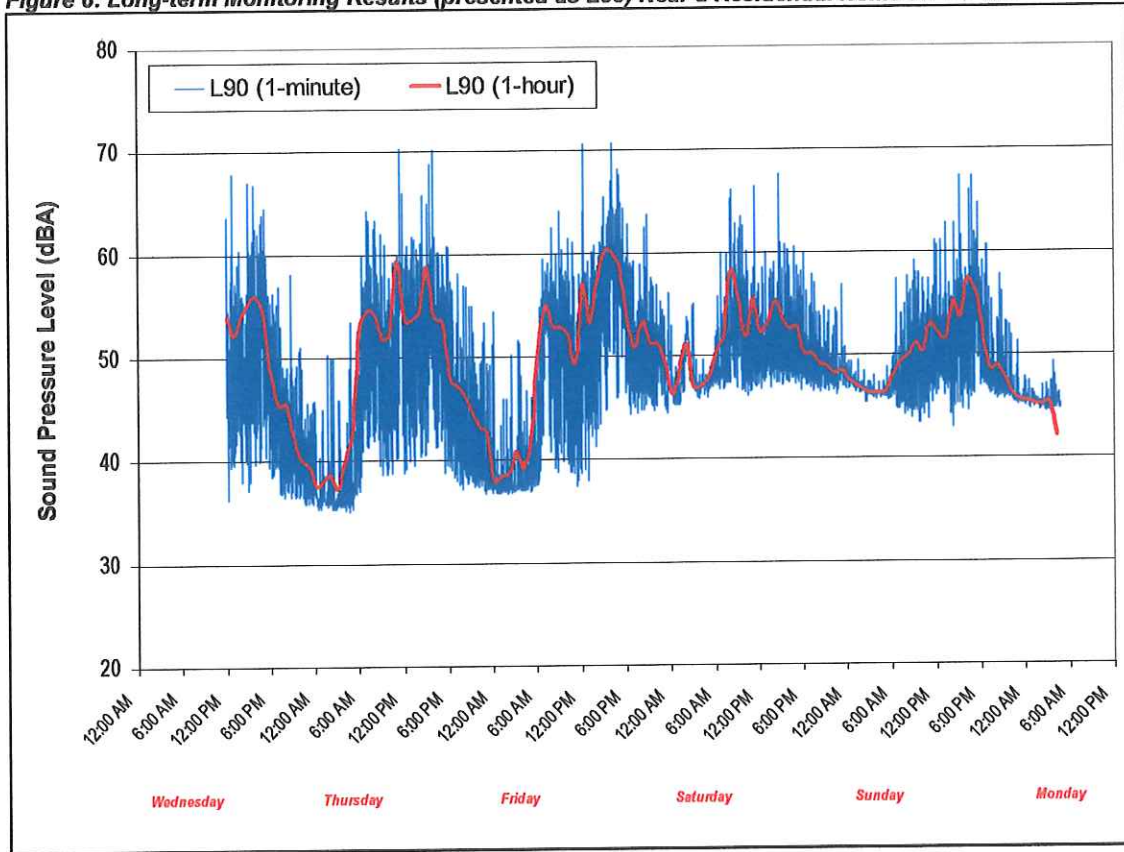


Figure 6: Long-term Monitoring Results (presented as L90) Near a Residential Home on VT 103



CONCLUSIONS

We conducted sound level monitoring of both the existing quarry operations and the background sound levels near the proposed quarry. Much of the noise measured at the existing quarry was not audible at Cavendish Road, though this in part is due to the high levels of existing heavy traffic on VT 103. The drilling was the most prevalent quarry activity noted in the Cavendish Road area, though the topography of the site contributes to this, as the drill was located high up on the hill. However, in locations with different topography, noise from the loader and the rock splitters could be audible at this same tested distance.

The results of the long-term monitoring indicate ambient Leq sound levels are close to 70 dBA during the daytime periods. The L90 levels were between the mid 50s to low 60s during the same periods.

Please contact us if you should have any questions.

