Barton & Loguidice

May 16, 2021

Ms. Maxanne Resnick
Executive Director
Woodstock Land Conservancy
P.O. Box 864
Woodstock, NY 12498

RE: Professional Consulting Services – Noise Study Review and Comment - The 850 Project, Town of Kingston, NY.

File: 2338.001.001

Dear Ms. Resnick:

Barton & Loguidice, D.P.C. (B&L) is pleased to review and provide technical comments concerning the Noise Evaluation prepared by Maser Consulting, dated March 9, 2021 concerning the 850 Project in the Town of Kingston, NY.

1. Section K (page 14) of the Maser study includes "Recommended Mitigation Measures". In general, the means to carry out inspections of equipment and to monitor for potential impacts needs to be ensured. The inspections and monitoring are all part of the mitigation plan and confirmation under the SEQR process concerning environmental impacts. It is recommended that an escrow account be setup to fund these inspections by third-party sources as well as a structure of monetary accountability for violations. Site inspections also need to occur to ensure mitigation measures are being installed properly.

2. The Maser evaluation discusses noise monitoring during blasting and that a site-specific blasting plan will need to be prepared. It is not stated what this actually means. Blasting is very loud and startling. The plan needs to include what will be done to mitigate noise and how it will be implemented.

3. The study provides a representative noise level for Receptors 1 through 7. Table C-1 for Receptor 1 (attached) summarizes the construction noise levels of the rock drilling and harvesting process. However, the decibel level of the Blast Hole Drill Rig is stated as 84 dBA in contrast to the NYSDEC Table, included later on in the study, which identifies this source as 98 dBA. The Front End Loader noise source and the Dump Truck noise source from Table C-1, are for machines much smaller than what would be utilized in a rock blasting, loading, and transporting to the crusher function. Blasted hard rock, such as the rock on site, would not be expected to be loaded into a typical road worthy Tri-Axle dump truck until after processing. The machinery needed to handle the blasted rock include a "Euclid" type off-road dump truck (90 dBA) such as the type already observed to be on-site and a loader similar to the Hitachi 501 (92 dBA) as shown in the table below from page 268 of Maser Noise Study, March 9, 2021.

PROJECTED NOISE LEVELS

Noise Source	Measurements	1,000 feet	2,000 feet	3,000 feet
Primary and secondary crusher	89 dB(A) at 100 ft	69.0 dB(A)	63.0 dB(A)	59.5 dB(A)
Hitachi 501 shovel loading	92 dB(A) at 50 ft	66.0 dB(A)	60.0 dB(A)	56.5 dB(A)
Euclid R-50 pit truck loaded	90 dB(A) at 50 ft	64.0 dB(A)	58.0 dB(A)	54.4 dB(A)
Caterpillar 988 loader	80 dB(A) at 300 ft	69.5 dB(A)	63.5 dB(A)	60.0 dB(A)

(The Aggregate Handbook, 1991)

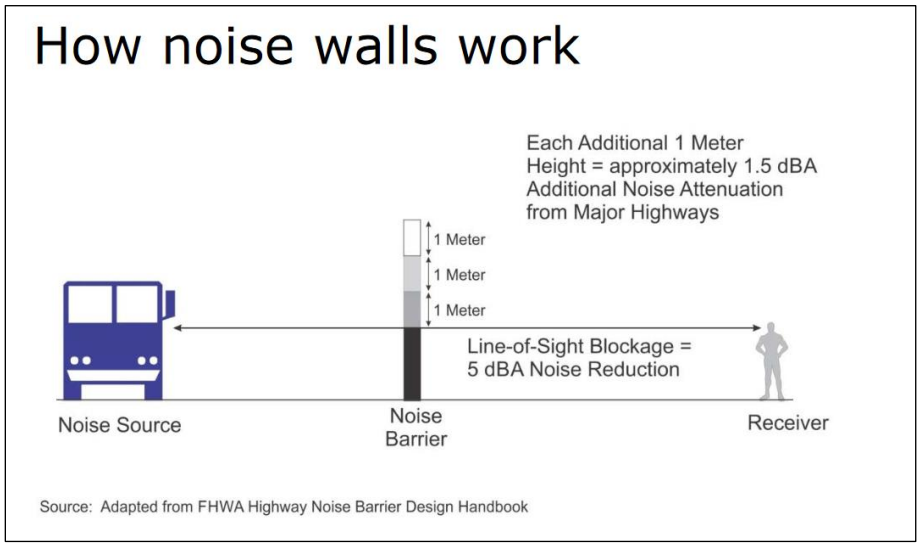
Continuing with Receptor R1, the noise level calculated for Receptor 1 assumed all the equipment would be operating at a distance of 800' away. This is not the case by any means. B&L Figure 1, provides examples of when the rock drilling and loading will take place approximately 150' from Receptor 1 and at a few other sample locations using the minimal information provided by the various maps, drawings with different scales and north-south orientations, missing contours, etc. and other submission materials. Applying the appropriate noise source levels as discussed above, and accounting for when the work is close to sensitive areas, not 800' away, the noise levels at locations along the trail will be more than 35 to 40 decibels higher than existing levels after accounting for minimal vegetative attenuation. <u>An over 20 dBA increase is intolerable according to the NYSDEC Policy.</u>

4. The report references a "No-Build Level" two dBA (2 dBA) higher than the measured levels. There is no basis for this arbitrary 2 dBA increase. If there is some rationale for this background growth in noise if the project is not constructed, this needs to be explained, include calculated backup, and/or comment.

5. The report references leaf-on and leaf-off which has no bearing on this study and should be removed. Leaf-off controls in noise studies unless the noise source operations only take place during the months of full foliage. Undergrowth must be dense for vegetative attenuation to be effective as claimed.

6. Noise berm attenuation in the study is assigned a 15 dBA reduction where the study quotes information from a Federal Highway Administration (FHWA) document called the *Audible Landscape* which was published in 1974. While correctly stated in the study that a barrier can reduce noise as much as 15 dBA, it does not mean that all barriers provide that level of performance. What is omitted from that discussion is that for a barrier to be effective, it first needs to cut-off the line of sight from the source to the receptor to provide 5 dBA of attenuation. Additional attenuation, as described in a more recent FHWA guidance (Highway Noise Barrier Design Handbook - February 2000), states that a barrier can provide up to 1.5 dBA of attenuation for every 1.0 meters (3.2') of additional height. Therefore, once the barrier is high enough to cut off the line of sight of the noise source from the location it is proposing to

shield, it must be more than twenty-one (21') higher than that initial cut-off height to provide a 15 dBA reduction. Using the data provided in the various noise studies to date, it is apparent that this type of berm attenuation is not being proposed. The berms proposed in the study are only 15' in height, the terrain differences and the various noise source locations in relation to the berms have not been adequately considered. Note that the engine fans, engine, and exhaust system are the primary noise sources on the heavy equipment to be used and they are at least 6' tall to start with.



7. Past comments by B&L on this project included a request for noise contours so that the expected levels from the project can be presented in a clear way for all to understand what will really happen at this site during three (3) years of rock removal. Noise contours will reveal the true change in the noise environment surrounding the site if they consider all sources as a result of the project and ambient levels. Providing an accurate expected noise level model to develop contours requires the existing terrain, all noise sources, mitigation, and construction staging to be analyzed as a whole at their various locations on the site. Cross sections of the site, noise berm elevations compared to existing ground and compared to the areas of impact off-site (trails) are required. The intent of this letter is not to do the work for the applicant as there are many more calculations and design elements that are required to properly represent the noise environment that will be the result of the proposed project as it is presented up to this point.

8. Large areas of embankment (fill) will be placed to raise the elevation of the site at least ten feet (10') in elevation or more especially on the western and northwestern side of the site. It can be reasonably expected that rock from the site will be used to make up the elevation differences. These operations will be going on simultaneously with the rock removal, however, they are not included as a source of noise and combined with the rock removal or trucking, etc. This work will add to the noise levels already predicted and need to be accounted for.

9. The proposed sound fence is shown to include concrete bases for the posts. The Applicant seems to be committing to install concrete footings or rock coring every 10' feet for the sound fence. While this may be the case for the permanent fence, it is not likely going to occur for the temporary locations. Any gaps along the bottom of the fence will need to be sealed off to prevent transmission of noise under the fence for the temporary and permanent installations. Installing temporary sound fence over uneven rocky terrain is very difficult and will be challenging to seal off the pole bases to prevent noise leakage.

10. Under Section K – Mitigation measures on page 12, there is discussion of what should be done and what could be done. This needs to be committed to. Specifically items 4, 5, and 6 discuss noise fence and berms and varying terrain in just a qualitative sense. Phrases like "differences in grade will provide some natural attenuation" and "….will reduce the sound", "….should be located to" doesn't provide any real substance in a quantifiable sense to determine actual effectiveness these proposed mitigation practices will actually provide. There is no backup or calculations to show these methods will work on this site or to what degree. The likelihood of impacts of over just 10 to 15 dBA need engineered mitigation and cannot be resolved by qualitative discussion. Mitigating 30 to 40 dBA may not be possible at this site.

11. It is not clear what quantitative benefit the Acoustifence is proposing to provide for noise mitigation. The applicant needs to provide this information and how it will quantitatively reduce the noise levels from the site.

12. For informational purposes to the WLC and the Town, we offer the following discussion on Acoustifence.

    The sound fence shown on the Sound Barrier Plan proposes to use a proprietary product described as Acoustifence. The 1/8" thick material proposed has a Sound Transmission Class of 28 decibels (STC 28). This does not mean it will reduce the noise levels by 28 dBA. The testing used to determine the STC ratings is from the 1960s and does not include the lower frequencies of human hearing in the ratings, which just happens to be where the majority of the construction noise produced on the site will be (125 Hz and lower).

    Examples of noise sources below 125 Hz

    - Most of the sound energy generated by the average home theater
    - Traffic noise from airplanes, trucks, and heavy equipment operation
    - Guitar, bass, drums
    - Industrial equipment, pump systems

    For comparison purposes, an interior wall with a sheet of 1/2" Gypsum wallboard (sheetrock) on each side has an STC rating of 33 and normal speech can be heard and understood with typical face-to-face speech at approximately 65 dBA. What Acoustifence is good at is reducing sound levels in the higher frequencies and if used in conjunction with sheetrock, can make it difficult to understand what a person is saying in the adjacent room even though you can still hear them

speaking. The product description from the Acoustifence website goes on to say that Performance is relative to your installation and the following variables:

- Sealing of any gaps or joints in the fence including any gaps at the bottom,
- The person's particular position relevant to the position of all other objects which may reflect some non-direct sound over or around your fence
- The specific frequencies of the noise, as some are reduced more than others
- The wind will have some effect as well.

Overall, the largest problem with relying on the STC number alone is that the STC testing only considers frequencies between 125 Hz and 4,000 Hz. Human hearing is from 20 Hz to 20,000 HZ. The STC rating can be misleading because many complaints are from noise sources that are at, or below, 125 Hz.

13. Page 13 number 9, discusses HVAC and inside building attenuation. These items should not be recommendations. These are real noise contributors and they can't be dismissed by simply recommending them. If the Noise Study recommends them, is the Applicant committing to noise enclosures on the rooftop for HVAC equipment and the other items listed under Section K on pages 12-14?

14. The rock crusher shown in Section B-B' from a previous study is shown to be only 5 or 6 feet tall. It can be reasonably assumed that will not be the case. The actual "noise" height of the proposed rock crusher and conveyor system needs to be stated so attenuation from noise berms can be evaluated for effectiveness and to properly quantify attenuation by noise berms.

15. The study references the construction period or site development phase as temporary. It appears that this period will be three (3) to four (4) years, which would not likely be considered "temporary" to the impacted resources or even the general public.

    It is suggested that a demonstration, of what 10, 20, and 30 dBA increases actually sound like be conducted since there will be at least 3 years of these noise levels to be endured by trail users and others surrounding the proposed site.

16. As stated earlier, noise contour plans/maps should be required by the Town as they can easily provide a guide to the Town for monitoring the site and as a document for enforcement. Any point surrounding the site can be reviewed with noise contour mapping, not just individual locations where interpretation between points can be a gray area.

17. Measured noise levels were noted on page 5 that they were conducted "during the peak periods" on September 3, 2020 and September 24, 2021. It is not clear what "peak" period the study is referring too. Looking at the start times for the measurements, it could be that the measurements were started during the peak mid-day traffic period and the PM peak traffic period. Either way, measurements to determine existing noise for an environmental study should not be taken during a "peak" period. The measurements for a study such as this need to represent the majority of the time of a typical day. In contrast, traffic noise studies are

conducted typically during peak periods for different reasons, however, that is not applicable here in this case.

Previous measurements of existing noise submitted by the applicant through other studies indicate lower existing noise levels. The applicant needs to clarify why the measurements in this study were taken during a "peak" period. Trail and recreational visitors are not restricted to using the trails only during "peak" periods, consequently, the impacts would be greater during the non-peak periods.

If you have any questions at all concerning this review, please do not hesitate to contact me at our Albany Office at (518) 218-1801 or by cell phone at (518) 423-1062.

Sincerely,

BARTON & LOGUIDICE, D.P.C.

Thomas C. Baird, P.E.
Associate
TCB/with 3 enclosures

R4

R5

S = 51 dBA Exist.
S=79 dBA (+27) @ 600'
S=72 dBA (+21) @ 800'

S

R2 = 49 Exist.
R2 = 90+ Build

600 foot

800 foot

R2

R3= 53 Exist.

T=90 dBA Build
(+41 dBA on the trail)

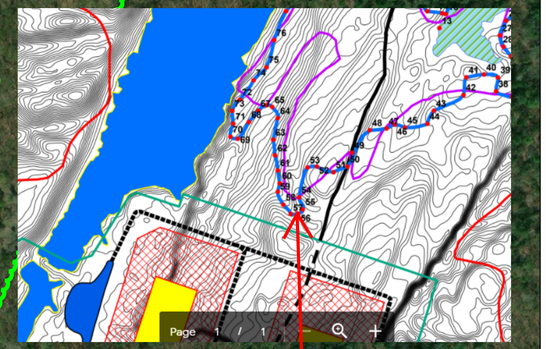
Exist Elev=500'

T

150 foot

570 foot

R1= 49 Exist.
R1 = 90+ Build

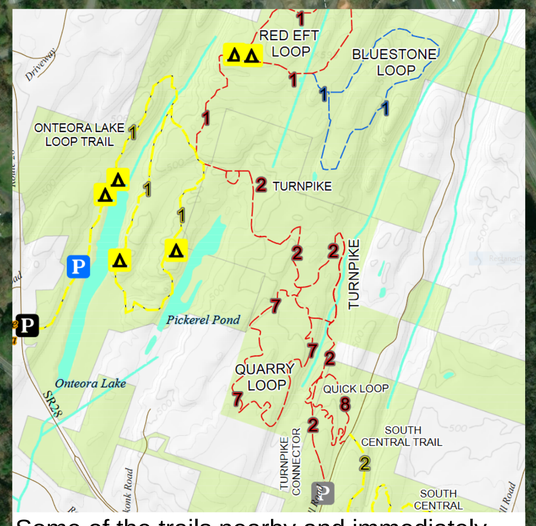


R7

Red Shaded Area is Rock Removal
Blue Box is Rock Processing Location
Green Lines are trail Areas
R = Maser Receptor Locations
T and Q = Example Build Receptors
All levels are in dBA if not noted

Rock Drill, Loader, and likely Two (2) Euclid's will be everywhere in the Red Shaded Area Conducting Drilling, blasting, loading and moving, dumping. Bulldozer in the western end to spread stone for 10' fills not in study

T = BUILD = 90 dBA at 150' from work area
Q = BUILD = 72 dBA at 800' (includes 5 dBA of Tree and Vegetation Attenuation)
R = BUILD = 72 DBA includes 6 dBA of Vegeta-tive Attenuation
S = 79 dBA on Trail at 600'



Some of the trails nearby and immediately adjacent to site

707 foot

800 foot

Sparse Vegetation - little to no attenuation due to vegetation

R6 = 53 dBA
Existing

R

R=72 dBA
(+19) Build

Q

Q=72 dBA
(+ >15 dBA)

Equipment Noise Data at 50' Reference Distance - Source of Data - Noise Level at 150'

Blast Hole Drill Rig = 98 dBA (Maser Study - NYSDEC Table) - 89 dBA at 150'
Large Front-End Loader Loading Euclid Truck = 92 (Maser Study - NYSDEC) 80 dBA at 150'
Crusher = 95 dBA (Maser Study) - 74 dBA at 600'
Euclid Haul Truck = 90 dBA (Maser Study - NYSDEC) - 81 dBA at 150'

Sources:.....

Barton & Loguidice, D.P.C.
Engineers • Environmental Scientists • Planners • Landscape Arch

Figure Demonstrates noise levels while Rock Removal work is performed at the closer locations to the trails, not just at a few select locations. Attenuation from berms not determined by B&L, but need to be calculated and presented and quantified individually to prove intended performance

1 inch = 200 feet

Noise Levels must be accounted for during operations at all locations

Noise Study Review and Comment
The 850 Project, Town of Kingston, NY

Figure 1

Project No. ----.----

Example: Looks like Fill will be placed all through this Area. This Noise has not been accounted for Bulldozer, Vibratory Compactors, Etc.

PHASE 1

PICKEREL POND

EXIST HIKING

SILT FENCE

10' high Fill

WATER QUALITY BASIN #2

WATER QUALITY BASIN #1

EXISTING ROAD FOR CONSTRUCTION ACCESS

5' high Rock Removal

20' high Rock Removal

12' TO 16' TALL SOUND FENCE

INSTALL 3' DIAMETER DRAINAGE PIPE THROUGH SOUND BERM TO FOREBAY OF SEDIMENTATION BASIN

TEMPORARY SOUND BERM #1

PROPOSED 120,000SF STEEL AND CONCRETE FABRICATION BUILDING #1 FF=490'

TEMPORARY SOUND BERM #4

TEMPORARY SOUND BERM #5

PHASE 2

TEMPORARY SOUND BERM #2

25'+ of Rock Removal

ROCK CUT FACE

PROPOSED ROCK PROCESSING AREA

TEMPORARY SOUND BERM #3

10' of Rock Removal

20' of Rock Removal

10' High Rock Removal

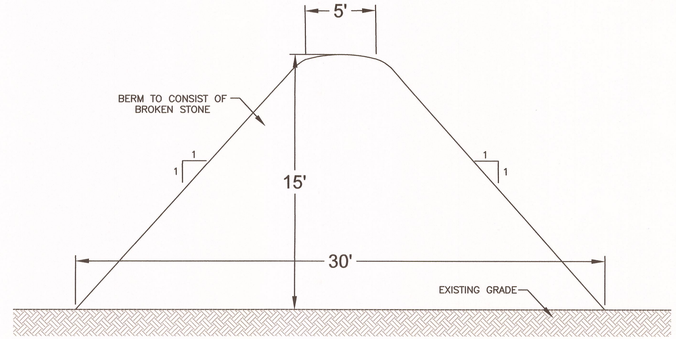
TEMPORARY 12' TALL SOUND FENCE

SOUND BERM #1

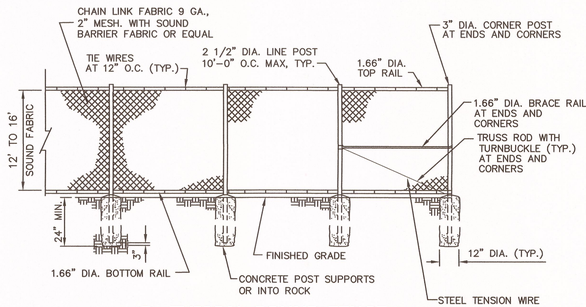
PROPOSED 120,000SF STEEL AND CONCRETE FABRICATION BUILDING #2 FF=525'

SOUND BERM #2

10'+ of Rock Removal over Whole area



TYPICAL SOUND BERM
NOT TO SCALE



TYPICAL SOUND FENCE
NOT TO SCALE

NOTE: FINAL HEIGHT OF SOUND WALL TO BE FIELD VERIFIED AFTER CONSTRUCTION

PHASE 1 SOUND BARRIERS

- TEMPORARY SOUND BARRIERS #1, #2, #3 AND #4.
- SOUND FENCE ALONG NORTH AND WEST SIDES OF PHASE 1 PARKING
- FINAL BERM HEIGHT TO BE FIELD VERIFIED AFTER PLACEMENT AND OPERATION OF ROCK CRUSHER

PHASE 2 SOUND BARRIERS

- SOUND BERMS #1, #2, TEMPORARY SOUND BERM #5 AND SOUND FENCE ALONG SOUTH AND NORTH SIDE OF PHASE 2 AREA.

SEE PHASING PLAN, SHEET PH-1 FOR PHASING OF SOUND BARRIERS.

- DURING EACH STAGE OF PHASE/WORK, THE FINAL POSITION OF THE TEMPORARY SOUND BERMS AND FENCES SHOWN ON THE PLAN SHALL BE VERIFIED AND APPROVED BY THE TOWN'S NOISE CONSULTANT

KEY LEGEND

- PROCESSING AREA
- SOUND BERM – TEMPORARY
- SOUND BERM – PERMANENT
- SOUND FENCE – TEMPORARY
- SOUND FENCE – PERMANENT

MAP REVISION DATES

DATE	REVISION	BY
02/03/2021	REVISED SOUND BERM AND SOUND FENCE DETAILS	CC
03/03/2021	REVISION PER CONSULTANT COMMENTS	SL

SOUND BARRIER PLAN

FOR

850 ROUTE 28 LLC

TOWN OF KINGSTON
ULSTER COUNTY NEW YORK

100 0 100 200 300

Scale: 1" = 100'

NOVEMBER 26, 2019

MEDENBACH & EGGERS
CIVIL ENGINEERING & LAND SURVEYING, P.C.
STONE RIDGE, NEW YORK (845) 687-0047
BARRY MEDENBACH, P.E.
NEW YORK LIC. NO. 60142

Table C-1 (Without Mitigation) - Typical
Summary of Construction Noise Levels (Receptor 1)

	Construction Vehicle:	Decibel Level at 50 ft (dBA):
1)	Blast Hole Drill Rig	84
2)	Front-End Loader Loading Haul Truck	81
3)	Crusher	95
4)	Dump Truck	78
5)	Concrete Mixer	79
6)	Other	

Step 1: **Summation of Sound Powers Equation**

$L_{pt} = 10 \log \Sigma (10^{a/10} + 10^{b/10} + 10^{c/10} + \ldots)$

Computed Total Onsite Noise Level:

= 95.7 dBA

Step 2: **Noise Estimation Equation Factoring in Distance and Other Attenuation**

(Input the result of the Sound Powers Equation)

$L_A = L_{pt} - 20 \log (\text{Distance}/50) - Y - Z$

where:

Input		
	L_{pt} -	The result from the summation of Sound Powers Equation.
800	Distance -	The distance between the construction vehicles and point of analysis.
50	50 -	Reference distance at which the decibel levels for construction vehicles were measured and used in the Summation of Sound Powers Equation.
0	Y -	Attenuation due to Existing Grades/Berm/Hillside
0	Z -	Attenuation due to Vegetation Buffer

Noise Level at Receptor:

L_A = 71.6 dBA