Global Solution Yielding Sustainable Results

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Project ID: 3522
March 16, 2020

Subject: **850 Route 28 LLC, Kingston, NY**
Peer Review of Noise Section of EAF

Dear Mr. Richard Golden and Ms. Kelly Naughton,

On behalf of CHANGE Environmental, it is our pleasure to submit to you this document of our intensive and detailed review of the files provided.

Thank you,

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We have reviewed the following documents concerning the proposed manufacturing facility at 850 Route 28 LLC in Kingston, New York:

1. Noise Study, 850 Route 28, LLC, by H2H Associates, LLC, February 2019.
2. 12-Hour Ambient Sound Study, 850 Route 28, LLC, by H2H Associates, LLC, November 2019.
3. Noise Chapter of Environmental Assessment Form Addendum for 850 Route 28 LLC Proposed Manufacturing Facility, Medenbach & Eggers, November 30, 2019, Revised February 26, 2020.

Based on our review of these, the associated site plans (dated November 26, 2019) and comments on the noise studies and sections, we offer the following comments:

1. February 2019 Noise Study
    a. <u>General:</u>
        i. *Thresholds of significance:* Please clearly define the thresholds of significance that are used in the report.
        ii. *Blasting:* Vibration and groundborne noise from blasting activities is not assessed in the report, although the responses to comments indicate that blasting will occur. Blasting can generate high levels of vibration that could damage structures and result in annoyance to residents, even at large distances from blasting activities.
        iii. *Noise Modeling*: It is unclear why noise modeling was not conducted to assess construction and operational impacts at residential and recreational lands surrounding the project site. Considering the large amount of topography and foliage located between the noise sources and the receptors and the large area of interest including both residential and recreational land uses, noise modeling would be a more accurate method of predicting this attenuation. As it is, without noise modeling, more explanation of how these noise reduction values were calculated is needed.
        iv. *Nighttime Ambient Noise Levels*: The report does not include a discussion of nighttime ambient noise levels. Nighttime operations should be

compared to nighttime ambient noise levels, which are typically lower than daytime levels.

v. *Operational Noise*: The report does not include a quantitative description of operational on-site or associated traffic noise at residences. Considering that operations are anticipated to occur 24-hours per day and ambient noise levels at residences are low, the potential for nighttime operations to awaken residents should be assessed.

vi. *Mitigation Measures:* The report does not include a quantitative description of mitigation measures or how they will result in noise impacts being reduced to a less than significant level.

vii. *Typos:* There are many typos in this document that could potentially result in misreading of the analysis and results.

b. <u>2.0 Ambient Noise Monitoring and 2.3 Methodology:</u>

i. Measurements made on December 26 may not be representative of typical levels occurring at these sites. Traffic patterns in periods close to holidays can be atypical, resulting in noise levels and/or trends that may not occur during other periods of the year.

ii. Please explain why dosimeters were used for the measurement of environmental noise. Typically, Type 1 or 2 (Class 1 or 2) sound level meters would be used for environmental measurements. Dosimeters are typically used to attain the daily noise dose, a person's daily exposure to noise over a work shift in an industrial setting.

iii. Please clarify why surface elevation was included in the table in Section 2.2. Although topography does have a large effect on sound attenuation, this is not assessed quantitatively anywhere in the report. Perhaps a better parameter to list is distance.

c. <u>2.4 Ambient Survey Monitoring Results:</u>

i. Please clarify why fast response was used. Typically, slow response (1 sec averaging time) is used for environmental noise measurements, as it is representative of how humans perceive noise. Fast response (0.125 sec averaging time) is typically used only for noise sources which are impulsive in nature, such as a gunshot, and gives a falsely high maximum

level results when compared to the more traditional slow response results.

ii. Please confirm that all results use the A-Weighting network (dBA), as indicated in the first paragraph of Section 2.4. Use of the A-weighting network is traditionally indicated through use of the unit 'dBA'. The report uses the unit 'dB', which would normally indicate that the results are unweighted. Further, review of Appendix C shows that both A and C-Weighted measurements were made. The A-Weighting network is representative of human hearing and is typically used for environmental noise studies where humans are the primary concern. The C-weighting network would not typically be used for environmental noise measurements unless high low-frequency content is anticipated, such as for wind turbines.

iii. Please clarify the reasons for the variations of run times selected for each location. Construction and operational noise levels should be calculated on an hourly or other defined time averaging basis. To compare project levels to ambient, like parameters should be compared. Use of different averaging times could skew the results.

iv. Given that operations are proposed for daytime and nighttime periods, please clarify why ambient noise measurements were not conducted at night when ambient levels would likely be lower.

v. In the paragraph beneath Table 2, the report claims "the L_{eq} for the Site was 48.0 dB." Please provide the data to back up this claim, as it does not appear in Table 2.

d. <u>2.5 Simulated Operating Monitoring Results:</u>

i. It would be helpful to have additional acoustical parameter results beside only the overall 1 h 24 min L_{eq} average, so as to understand the characteristics of the equipment operation. For example, L_{max} (the maximum 1-second average), L_{10} (the noise level exceeded 10% of the time), and L_{90} (the noise level exceeded 90% of the time).

ii. A better explanation of how the equipment was being operated (continuously, occasionally, or in a cycle of ongoing activities) would also be helpful. Also, the results show no indication of how much of the noise

measured was associated with the simulated sound source and how much was due to other ambient sources.

iii. The noise levels shown in Table 3 are almost identical to what would be calculated using a straight 6 dB per doubling of distance for noise propagation. For logging station 13, the level in Table 3 is greater than that that would occur given distance attenuation. This indicates to me that foliage and other existing site characteristics and topography are not providing additional attenuation over the standard propagation (see below on comments concerning attenuation provided for foliage in Tables 4 to 7).

iv. The text below the Table 3 describes the ambient levels and the levels generated with the simulated sound source. However, it fails to calculate the contribution of the sound source at each location and instead give only an increase between the two measured levels. The simulated noise source contribution can easily be calculated by subtracting the ambient from the simulated source level on an energetic basis. For example for logging station 11, 41.2 dB – 39.3 dB = 36.7 dB contribution from the simulated source. This would be a much more useful method of approximating additional attenuation from topography and foliage.

v. The claim under Logging Station 11 that "the slight increase of 1.9 dB demonstrates how attenuating features (i.e., topography, vegetation, distance from source etc.) reduce facility-related noise" is unsubstantiated. As described above, from Table 3 it appears Logging Station 11 drops off at the traditional 6 dB per doubling of distance from the 100-foot reference location.

vi. Likewise, the claim under Logging Station 12 that "an increase of 5.3 dB was observed between ambient and operating at this location because logging station 12 is 380 feet closer to the simulated sound source, and at the same elevation. This is why the increase in operating dB is larger at this location" is only partially substantiated. This larger difference is due to the combination of a lower ambient level (37.2 dB vs. 39.3 dB for Station 11) combined with being located 380 feet closer to the simulated noise source.

vii. Under Logging Station 12, the report states that "sound could be heard from the simulated sound source, but the predominate source of sound is State Route 28." Given that the noise source results in a 5.3 dB increase at this location, it is hard to believe that the simulated noise source is not the dominant source. With an ambient level of 37.3 dB and an ambient plus simulated source level of 42.5 dB, the simulated source would have contributed a noise level of 41.0 dB, which is 3.7 dB higher than the ambient.

e. 3.1 Projected Sound Levels at Receptors:
   i. Please provide references for the noise levels indicated in Table 3. Note that 96 dB at a distance of 100 feet is very loud; higher in level than any of the equipment listed in NYSDEC Policy Table D (Appendix A of the report).
   ii. Again, please confirm the levels in Table 3 are A-Weighted.
   iii. Please provide timing of construction activities. Will construction occur during nighttime or weekend hours?
   iv. Please provide a discussion of blasting vibration and groundborne noise.

f. 3.2 Projected Sound Levels at Receptors:
   i. Please provide references for the claim "H2H has historic measurements of how each attenuating factor affects sound from a source." Each site has unique attenuation qualities related to topography, foliage, noise sources, meteorology, etc. Entire books have been written on each of these topics. So, it is difficult to believe that H2H has acquired enough data to quantify these effects at this particular site without data to back up this claim.
   ii. Again, please confirm the levels in Tables 4 to 7 are A-Weighted.
   iii. The noise report makes unsubstantiated claims as to the noise reduction provided by the proposed berms and the existing topography and foliage, as follows.
   iv. Based on the standard 6 dB per doubling of distance, the equipment noise levels at R-1 and R-2 would be 72 and 70.5 dB, respectively. This means that 24 dB of noise reduction in addition to distance attenuation occurs to result in the levels given in Table 4, 19 to 22 dB in Table 5, and

16 to 22 dB in Table 6. This amount is unsupported in the report. Even assuming that the berms do provide 14 dB of noise reduction and the foliage provided 7 dB, this would only add up to 21 dB of additional reduction, which is less than the 22 to 24 dB of reduction assumes for R-1. Based on the results shown in Table 2 (see comment above under d.) and the discussion below, foliage is not providing substantial attenuation. Additionally, the report shows no basis for attributing 14 dB of reduction to the berm (see discussion below).

v. The report claims a 7 dBA noise reduction for vegetation located between the project site and the residences. However, the vegetation in the area is deciduous. As such, only minimal reduction would be provided in the winter when these trees lose their leaves. Based on *Acoustical Measurement and Noise Control* (Harris, C., 1998, Pg. 3.9) "there is no attenuation for bare branches or trunks of trees."

vi. The report claims that "a 10 foot (wide?) by 15 foot (high?) berm will cause a 14 dB decrease" at both locations R-1 and R-2, located from 580 to 1,876 feet from the various noise sources. Based on a preliminary noise barrier calculation conducted by the author of these comments using I&R in-house software, approximately 11 dBA of noise reduction would be achieved through use of a 15-foot high barrier at a receptor distance of 580 to 1,800 feet, assuming a 5 foot high noise source (height of noise source is not given). Additionally, assuming the location of the barriers to be those shown in the November 26, 2019 Sound Barrier Plan (berms are not indicated in the February 2019 Noise Report Figures), only partial shielding would be provided to residences to the south. With partial shielding only, even less attenuation would be achieved through shielding of the berm at these locations.

vii. It is not clear if the column D Projected Sound Levels in Tables 4 to 7 include only the Project generated noise levels or the Project plus Ambient levels. If column D gives the Project levels only, then the change in noise levels in these tables is calculated incorrectly. The change in noise levels must be calculated by taking the difference between the Ambient Sound Level and the Project plus Ambient Sound Level, not the

difference between the Ambient and the Project only sound levels. For example, in Table 5 for R-1, Ambient is 37.2 dB and Projected is 40.3 dB. The Ambient + Project level would be then be 42.0 dB and the resulting change would be 4.8 dB (42.0 – 37.2), not 3.1 dB.

viii. The projected sound level (column D) for R-2 in Table 7 is calculated incorrectly. A combination of the front end loader and the blast hole drill rig operating simultaneously could not result in levels that are 2 dB below the results indicated (in Tables 5 and 6) for each of the sources independently.

g. 4.0 Findings:
   i. Note that the increases discussed in the report may be lower than the actual increases if the changes shown in Tables 4 to 7 are incorrect, as described in comment f. vii above.

h. 5.0 Long-term Site Operations: More information is needed describing why long-term operations will not result in significant noise impacts at residences.
   i. Noise levels for on-site operations at nearby residences should be calculated and described with respect to both daytime and nighttime ambient levels.
   ii. No assessment of operational traffic noise is given. Although nighttime ambient noise levels were not measured, we can assume they are lower than those measured in the daytime. The report should consider the potential of awakening of residents due to project vehicle trips to and from the site during shift changes or other nighttime activities.
   iii. More details are needed to describe activities proposed inside the building and the building structure itself to ensure that indoor activities will not result in noise impacts.

i. 6.0 Mitigation Measures:
   i. This discussion is qualitative and vague. Please provide quantitative discussion explaining the exact location of all mitigation measures and how these mitigation measures would result in the impacts being less than significant. The numerical noise reduction anticipated with implementation of these measures and the resulting noise levels should be given.

ii. The is the first mention of a backup beeper. Backup beepers are considered to be "sharp and startling noise" that "can be extremely annoying" under NYSDEC. If backup beepers are proposed for construction or operations, they need to be assessed in the report.

j. 7.0 Conclusion:
   i. Again, a quantitative discussion of mitigation measures and how they will reduce the noise impacts to result in "minimal disturbance to the neighboring Receptors" is needed.
   ii. Discussion of operational impacts and blasting vibration should be included.

k. References:
   i. A number of references are listed; however, it is not identified as to which portion of the report they refer to. Please site references within the report.
   ii. Of particular interest is why the report would reference studies on the "Physics and Psychophysics of Music" and the Danish Wind Turbine Manufacturers Associations document on measuring and calculating sound levels. Neither of these documents seem to be relevant to the noise study.

2. November 2019 Noise Study
   a. General:
      i. Thresholds of significance: Please clearly define the thresholds of significance that are used in the report.
      ii. *Noise Modeling*: Again, it is unclear why noise modeling was not conducted to assess construction and operational impacts at residential and recreational lands surrounding the project site. Given that the recreational use areas are large in area, noise contour maps would provide information for all of the surrounding land uses of interest, not just the three points selected for evaluation in the noise study.
   b. 2.0 Ambient Noise Monitoring and 2.3 Methodology:

i. Again, perhaps distance would be a better parameter to list in the table in Section 2.2 instead of elevation, since elevation is not addressed in the report elsewhere.
ii. The terms 'sound level meter' and 'dosimeter' appear to be being used interchangeably here. This equipment is not interchangeable. Please clarify if sound level meters or dosimeters were used for the analysis.
iii. Again, slow response should be used for environmental noise measurements, as it is representative of how humans perceive noise. Fast response (0.125 sec averaging time) is typically used only for noise sources which are impulsive in nature, such as a gunshot, and gives a falsely high maximum level results when compared to the more traditional slow response results.

c. <u>2.4 Ambient Survey Monitoring Results:</u>
i. Again, please confirm that all results use the A-Weighting network (dBA), as indicated in Section 2.3.1 and in Chapters 3.0 and forward. Table 2 and the following text uses the unit 'dB', which would normally indicate that the results are unweighted. Results should be compared using the same weighting scale.
ii. Please clarify the reasons for the selection of a 12-hour time average. Will construction occur for a period of 12 hours per day?
iii. Given that operations are proposed for daytime and nighttime periods, please clarify why ambient noise measurements were not conducted at night when ambient levels would likely be lower. Presumably, the use of the NYS lands is during daytime only. If this is the case, this should be stated in the report.
iv. The report states that for Location 1 "The L_{max} for this monitoring location was 72.4 dB recorded at 6:12:51 AM. This event was caused by an acorn falling onto the sound level meter case." This data is not relevant to the study and should have been removed from the data set, so as not to affect the results.
v. For Location 1, the report states "The ambient equivalent sound levels during the morning and evening for this location were dominated by noise from nearby State Route 28 located approximately 3,000 feet to

the southwest". However, the data in Appendix D for Location 1 are not indicative of typical traffic noise patterns, but rather of a steady state noise source. Please explain the lack in variation in the noise levels shown in Appendix D.

vi. The report states that for Location 2 "The L_{max} for this monitoring location was 74.1 dB recorded at 7:52:09 AM. This event was caused by a stick snapping underfoot while checking on the monitor." Again, this data is not relevant to the study and should have been removed from the data set, so as not to affect the results.

vii. For all three locations, the study claims that traffic on State Route 28 was the dominant noise source. However, these locations were 2,460 and 3,000 feet from State Route 28 and result in noise levels that are 4 to 15 dB higher than the levels measured in the February 2019 report for locations that are substantially closer to the roadway (the February 2019 locations are 800 to 1,300 feet from SR 28). Please explain.

d. <u>3.0 Projected Sound Levels During Site Development:</u>
   i. The noise level listed for the crusher is 7 dB lower than that listed for the crusher in the February 2019 report. Please explain. Has the equipment changed form the February 2019 report? If so, the impacts at residential properties should be reevaluated.
   ii. The type of front-end loader has also changed, although the noise level is the same.
   iii. Please provide timing of construction activities. Will construction occur during nighttime or weekend hours?

e. <u>3.1 Projected Sound Levels at Property Boundary and 3.2 Projected Sound Levels at Receptors:</u>
   i. Please include a discussion of noise increases above ambient that would be expected at all receptors.
   ii. Please provide references for the claim "Based on historic sound level measurements collected by H2H a 30 foot wide by 15-foot high berm will cause a ~14 dB decrease in sound levels produced by mobile and stationary equipment when the sound source is 5 feet below the top of the berm." Based on a preliminary noise barrier calculation conducted by

the author of these comments using I&R in-house software, approximately 8 to 9 dBA of noise reduction would be achieved through use of a 15-foot high barrier, assuming a 10-foot high noise source at distances of 650 to 1,500 feet.

iii. Only three points were selected to represent the entire NYS lands. Locations set back further from the berm would likely see lower noise reduction from the proposed berms. Please provide additional information on why these particular locations are representative of worst-case noise exposure and/or provide additional results, perhaps in the form of a noise contour map, indicating noise levels for the remaining land area.

iv. Location 1 is located directly behind one of the proposed berms, so as to be in the shadow zone (area where very high noise reduction is realized by the barrier/berm). The noise reduction provided at this location would not be representative of the reduction provided at locations setback further from the berm.

v. Table 4 gives 19 dB of noise reduction in addition to distance attenuation to result in the levels indicated. This amount is unsupported in the report. The text states that 14 dB of noise reduction would be provided by the berm and that the "mitigate effects of vegetation have not been considered in our projections."

vi. Use of a decimal place in the result discussion gives a false sense of accuracy that is not warranted based on the assumptions given in the report. Sound level meters are typically only valid within +/- 1 dBA and use of rounded increases (such as 1 dB) due to addition of multiple sources followed by results that are not rounded is misleading. If decimal places are desired for the results, increases must also be calculated to the same degree of accuracy.

f. <u>4.1 Projected Sound Levels at Property Boundary (Manufacturing Activities):</u>

i. Please provide an assessment of operational traffic noise.

ii. Please provide timing of operational activities. Will operations occur during nighttime or weekend hours?

iii. More details are needed to describe activities proposed inside the building and the building structure itself to ensure that indoor activities will not result in noise impacts.

g. 5.0 Local, Representative Nosie Ordinances and Standards
   i. This discussion is helpful, but the thresholds of significance used in the report are not described. Please clearly define the thresholds of significance that are used in the report.
   ii. The parameters used for the Town of Ulster and City of Kingston noise ordinances are not defined. Are these levels maximum L_{max} levels, hourly average L_{eq} levels, 12-hour average L_{eq} levels?
   iii. Only daytime thresholds are provided for the representative cities, even though operations and construction may be occurring during nighttime hours. In addition, no references for recreational lands are provided. Commercial and industrial land use thresholds would not be considered representative for recreational lands.

h. 6.0 Summary:
   i. Please provide the calculated noise increases for each location under each scenario.
   ii. The resulting sound levels under each of the locations are calculated incorrectly. With project operations or construction, ambient noise levels would continue to occur. Therefore, the resulting levels must take ambient into account. For example, for location M-2, the front end loader generates a noise level of 52 dBA and the ambient is 52.2 dBA; therefore, the resulting level (ambient + front end loader) would be 55 dBA, a 3 dB noise increase above existing.
   iii. Please provide a quantitative discussion of mitigation measures and how they will reduce the noise at receptors.

i. References:
   i. Again, please site references within the body of the report.

3. 2020 EAF Noise Section

   j. General

i. *Thresholds of significance:* Please clearly define the thresholds of significance that are used.
ii. *Blasting:* Vibration and groundborne noise from blasting activities is not discussed. Blasting can generate high levels of vibration that could damage structures and result in annoyance to residents, even at large distances from blasting activities.
iii. *Construction and Operational Hours*: Please clearly state the hours of construction and operations that are proposed.
iv. *Operational Noise*: Please discuss the impacts of operational traffic on residences.
v. *Mitigation Measures:* Please provide a quantitative description of mitigation measures and how they will result in noise impacts being reduced to a less than significant level.
vi. *Placement of Noise Barriers:* The placement of berms differs between sheet PH-2 of the site plans (references in the EAF) and Figure 1 of the 2019 November Noise Report. No figure is provided for the placement of berms in the 2019 February Report. Please confirm that the change in location of the berms does not affect the results of the analysis.
vii. *Understatement of Impacts:* The noise increases that were determined in the 2019 February and 2019 November noise reports are not fully described in the EAF. Please include this information and how these impacts might be mitigated by the proposed mitigation. For example, the EAF states "the first report found that there will be an increase in noise at the residences during construction, however, this increase would be temporary and minimized by the proposed perimeter sound barriers and sound berms and the strategic placement of the rock crusher in the center of the site and surrounded by sound berms." The noise report found noise increases of up to 10.8 dBA at residences and construction will occur over a period of 3 years and provided no quantitative evidence that this impact would be substantially reduced through the proposed mitigation measures. Additionally, the 10.8 dB increase was calculated considering the proposed berms and also additional unexplained noise

attenuation. A noise increase of 10 dB would typically be experienced as a doubling of loudness.