Wake Stone Quarry Expansion: An acoustical and legal saga win

Erich Thalheimer, INCE Bd. Cert.[1]
WSP USA, Inc.
100 Summer Street
Boston, MA 02110

Jacob Poling, INCE[2]
Stantec, Inc.
733 Marquette Avenue
Minneapolis, MN 55402

ABSTRACT

Wake Stone Quarry in Cary, North Carolina, has been in operation for over 50 years excavating aggregate rock and gravel for roadways and concrete mixtures. Their initial open mining pit has been nearly exhausted, so they sought permission from the State to begin mining a second pit on their existing property. Unfortunately, opposition came from the heavily politically connected non-profit Umstead State Park abutting the quarry's property. To Wake Stone's dismay, their permit application was arbitrarily and capriciously denied by the State. What should have been a simple and straight-forward permit application turned into four years of intense acoustical and environmental studies eventually ending up in court. The main point of contention was noise potentially impacting the adjacent park, which was complicated all the more by the applicable state law being worded only qualitatively as "the applicant will not have a significantly adverse effect on the purposes of a publicly owned park, forest or recreation area". The stakes were very high; estimated at a future value of $500 million for Wake Stone. With WSP's assistance, including providing acoustical expert witness testimony in a lengthy two-week trial, Wake Stone eventually won their lawsuit saga and overturned the State's permit denial.

1. INTRODUCTION

A comprehensive environmental acoustical study was performed to evaluate noise potentially generated by the expansion of the Wake Stone Triangle Quarry located at 222 Star Lane in Cary, North Carolina. The quarry has been in operation since 1982. With approaching depletion of reserves in their existing pit (Pit 1), Wake Stone plans to expand to the adjacent RDU Odd Fellows Tract for opening of a second pit (Pit 2) on Wake Stone's existing property. Concern was expressed for the possible noise consequences associated with the new pit expansion with respect to noise levels propagating through the adjacent William B. Umstead State Park (Umstead State Park).

[1] Erich.Thalheimer@WSP.com
[2] Jacob.Poling@Stantec.com

In order to receive a permit from the North Carolina Department of Environmental Quality (NCDEQ) Division of Energy Mineral and Land Resources (DEMLR), Wake Stone had to demonstrate that noise from their new (Pit 2) operations would not have a *"significantly adverse effect on the purposes of a publicly owned park, forest or recreation area"*.

To that end, WSP performed a comprehensive acoustical study, taking into account the noise mitigation measures that Wake Stone has already publicly committed to install. The study was performed in accordance with the methods described in *Wake Stone Noise Study Protocol* dated 9/2/20, which were agreed to and accepted by DEMLR. Ambient and existing operational noise levels were measured throughout Umstead State Park, existing and future operational noise levels were modeled to estimate the changes in noise level expected in the park, and the results were evaluated against commonly accepted definitions of significant noise impact, i.e. future noise levels should not increase by more than 10 decibels above existing noise levels.

The results of the acoustical study found that, under worst-case noise producing conditions, noise levels throughout the park were expected to remain well below the 10-decibel relative increase limit definition. Thus, Wake Stone's expansion and operation into Pit 2 was <u>not</u> expected to cause a *significantly adverse* noise impact in the park. Some activities conducted in the new pit were anticipated to be audible in portions of the park, just as they are today. However, future noise levels were expected to only increase by 0 to 3 decibels throughout the vast majority of the park.

Unfortunately, when presented with these facts and findings, DEMLR denied Wake Stone's permit application under what Wake Stone considered to be arbitrary and capricious reasons. Thus, Wake Stone sued the State of North Carolina, and more specifically, DEMLR, to get the permit rejection overturned. After several years of exhaustive effort, legal and engineering cost, and courtroom drama, the judge ruled in favor of Wake Stone. DEMLR was forced to issue a permit to allow Wake Stone to start excavating Pit 2.

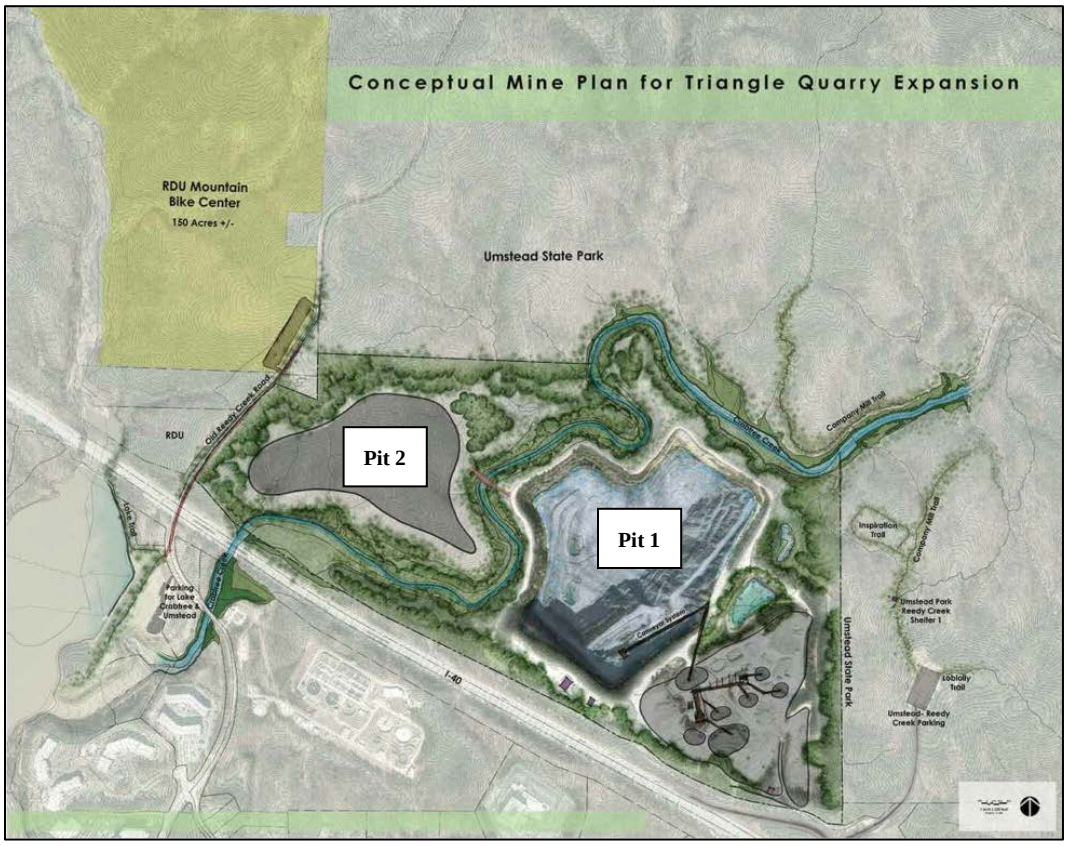
2. PROJECT DESCRIPTION

Wake Stone Triangle Quarry is located at 222 Star Lane in Cary, North Carolina. The quarry has been in operation since 1982. With the approaching depletion of reserves in their existing pit (Pit 1), Wake Stone plans to develop a second pit (Pit 2) on the adjoining RDU Odd Fellows Tract on Wake Stone's existing property, as shown in **Figure 1**. Concern has been expressed for the possible noise consequences associated with expansion of the new pit with respect to noise levels propagating through the adjacent Umstead State Park.

Once Pit 2 is approved for operation, the plan would include winding down and ceasing extraction operations in Pit 1 but still using surface equipment in its current location to process aggregate reserves excavated from Pit 2. Aggregate reserves in Pit 2 will be loosened using controlled blasting and then loaded in haul trucks for transport to the existing primary and secondary production plants. Thus, in total, the only aspects of the operation that would be changing from a noise perspective are where the mobile noise sources will be located and the haul truck routes.

Typical heavy earth moving equipment currently used in Pit 1 and the existing plant and stockpile yard areas include bulldozers, backhoes, excavators, front-end loaders, rock drills, rock crushers, feeders, vibrating screens, conveyors, haul trucks, graders, water trucks, pumps and man-lifts. Similar equipment will be used in Pit 2 also, with the exception of stationary equipment. Blasting is anticipated to be performed a couple times a week to loosen new material for excavation. Work hours are generally from 7 AM to 5 PM.

Figure 1. Wake Stone Triangle Quarry
Existing (Pit 1) and Proposed (Pit 2) Excavation Pits



Umstead State Park is a forest recreational area located immediately adjacent to the north and east of the Wake Stone Triangle Quarry. The area is a mature forest with approximately an even split between deciduous and conifer trees. Visitors have used the park since 1937 for hiking, bicycling, picnicking and seasonal camping. Various trails run through the park, with the majority of fixed sites (picnicking and camping) located relatively close to Wake Stone's existing facilities and operations in Pit 1. To that end, moving extraction operations to Pit 2 should be a noise benefit (i.e. reduction) for these picnic and camping sites. There is also one residence located along Old Reedy Creek Road immediately to the west of the new Pit 2 site at which noise levels would likely increase due to Pit 2 being located closer to the residence than Pit 1 is currently.

Highway I-40 runs along the southern boundary of the quarry and Umstead State Park causing traffic noise to be audible in both properties. Lastly, it should be noted that the park is bordered on the northwest by Raleigh Durham International Airport. Use of Runway 32-14 routes aircraft directly over Umstead State Park.

3. REGULATORY SETTING

According to the North Carolina Mining Act of 1971 administered by the North Carolina Department of Environmental Quality (NCDEQ) Division of Energy Mineral and Land Resources (DEMLR), Wake Stone must obtain a modification of their current Mining Permit in order to expand their operations. Wake Stone must demonstrate that noise from their new operations in Pit 2 will not have a *"significantly adverse effect on the purposes of a publicly owned park, forest or recreation area"*.

However, the Mining Act does not quantitatively define what is meant by *"significantly adverse effect"*. Thus, a task in this study involved research into the noise guidelines promulgated by other federal and state agencies with respect to noise impact for an outdoor park land-use. **Table 1** summarizes some of these noise guidelines.

The State of North Carolina does not regulate noise, so the responsibility is on the local governments. Noise ordinances of the counties where Wake Stone operations occur do not specifically mention noise criteria for parklands. Thus, in order to determine the noise criteria applicable for parklands, guidance documents published by various agencies were reviewed and the quantitative recommendations are summarized below.

Table 1. Various Noise Criteria for Parklands and Wilderness Areas

Guidance Source	Recommended Noise Criteria
US National Parks Services (NPS)	45 dBA L10 and 38 dBA L50
US Federal Highway Administration (FHWA)	57 to 67 dBA Leq(1hr)
US Federal Railroad/Transit Administrations (FRA/FTA)	+5 to +10 dBA Leq(h) above Ambient
US Federal Aviation Administration (FAA)	70 to 75 dBA Ldn
US Environmental Protection Agency (EPA)	70 dBA Leq(24hr) or 55 dBA Ldn
Federal Energy Regulatory Commission (FERC)	55 dBA Ldn and 49 dBA Leq
Federal Interagency Committee on Noise (FICON)	+5 dBA if Ambient is <60 dBA, +3 dBA if 60-65 dBA, +2 dBA if Ambient is >65 dBA
World Health Organization (WHO)	50 to 55 dBA Leq
North Carolina Department of Transportation (NCDOT)	67 dBA Leq(h) or an increase of +10 dBA
Massachusetts Environmental Protection (MassDEP)	Increase of +10 dBA above L90 Ambient
Washington State	55 dBA 07:00AM to 10:00PM
	45 dBA 10:00PM to 07:00AM
Minnesota State	65 dBA L10, 60 dBA L50, 07:00AM to 10:00PM
	55 dBA L10, 50 dBA L50, 10:00PM to 07:00AM

The US National Parks Service (NPS) recommended noise criteria are mostly intended for non-metropolitan area protected national parks, whereas Umstead State Park is located within an expanding metropolitan area adjacent to an airport and highway. As such, the stringent NPS recommended criteria of 45 dBA L10 and 38 dBA L50 are too conservative.

It is generally accepted that humans can barely perceive a change in noise level of +/- 1 decibel if listening intently, can likely perceive a change of +/- 3 decibels, can readily perceive a change of +/- 5 decibels, and will generally describe a change of +/- 10 decibels as a doubling or halving in loudness. From this commonly accepted subjective response description, acousticians and regulatory agencies have generally agreed that a 5-decibel increase would represent the *onset* threshold of a potential noise impact, and a 10-decibel increase would be a *significant noise impact*.

Moreover, the State of North Carolina Department of Transportation (NCDOT) has defined the term *substantial noise increase* in their Traffic Noise Policy dated 10/6/16. In it, a receptor is considered impacted by traffic noise if the predicted future hourly Leq traffic noise level exceeds the existing Leq traffic noise level by 10 decibels or more.

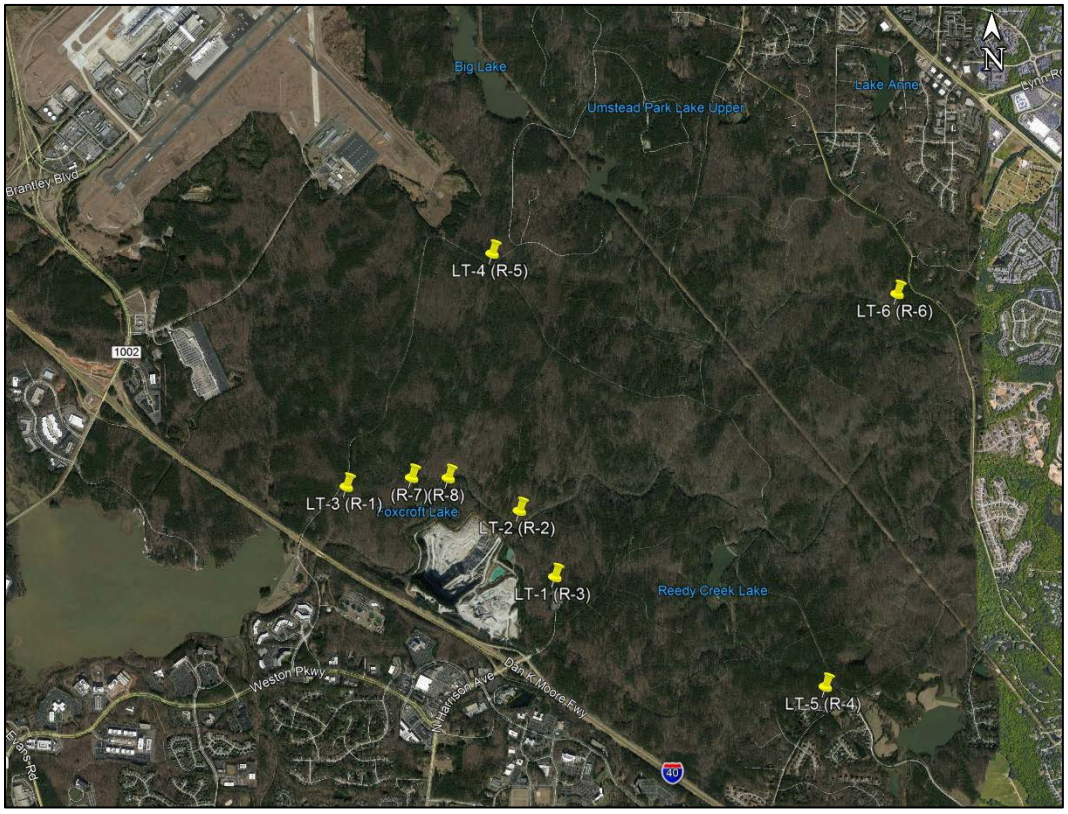
Consequently, where a 5-decibel increase might be perceptible, it requires a greater increase in noise level to constitute a significant increase. Thus, this acoustical study defined a ***"significantly adverse effect"*** as meaning a ***10-decibel or more increase*** *in future noise levels when compared to existing noise levels*. Thus, in order to allow for an "apples-to-apples" comparison of existing and future noise generated by the quarry, the noise assessment was completed using the estimated quarry-generated noise levels (see Section 6) without the contribution of other ambient noise sources.

4. EXISTING NOISE MEASUREMENTS

Existing ambient noise measurements were performed in and around Umstead State Park from 11/16/20 to 11/23/20 and again from 12/7/20 to 12/14/20. Long-term noise measurements lasting a week were performed at the six monitoring locations (LT-#) shown in **Figure 2**. The purpose of the long-term noise measurements were two fold, (1) to document actual existing noise conditions at selected locations throughout the park, and (2) to serve as a measured noise level against which modeled existing noise levels could be compared to ensure the model was performing as expected.

Long-term noise monitoring data was collected over Wake Stone's operating hours of 7:00 AM to 5:00 PM to capture three scenarios: (1) time periods when the quarry was in full production mode, (2) periods when the quarry was on a reduced work schedule performing mostly maintenance activities, and (3) Sunday periods when no work was being performed.

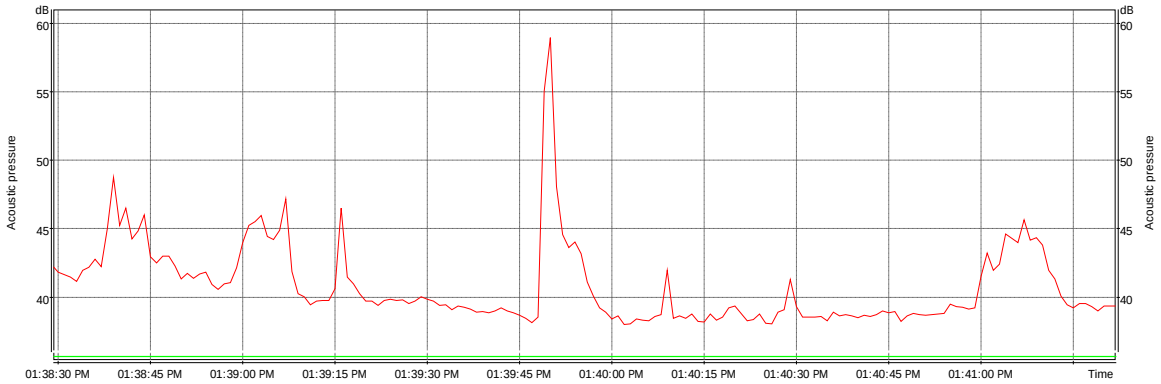
Figure 2. Long-Term Ambient Noise Monitoring Sites



In addition to long-term monitoring, short-term noise measurements, lasting 15 minutes, were also manually performed at four selected sites in Umstead State Park during the weeks of 11/16/20 to 11/23/20 and 12/7/20 to 12/14/20. The purpose of the short-term noise measurements was to positively identify and correlate audible noise sources with the sound levels being measured. This was particularly important to perform during the production blasts occurring during the monitoring periods.

The measurement data was later reviewed to identify and isolate the blast event that occurred during the short-term measurements. The sound level data was stored in 1-second intervals and an audio wave file was recorded throughout the measurement. Using Svantek's SvanPC® software, the recorded wave files were listened to while simultaneously viewing the measured noise data in order to audibly identify the 1-second interval where the maximum sound level from the blast occurred. As shown in **Figure 3**, the noise level during the blast was 59 dBA at Site R-7. The measured blast sound level was later also used to estimate the sound power emission of the blast for use in the noise model.

Figure 3. Blast Event: 59 dBA Leq(1s) at Site R-7 on 11/18/20



5. NOISE PREDICTION MODEL

Noise levels associated with operation of the existing quarry (Pit 1) and future quarry (Pit 2) were predicted using the Cadna-A® noise model, developed by DataKustik, GmbH. The Cadna-A model implements ISO Standard 9613-2 for environmental noise sources and outdoor sound propagation. All receptors were modeled at a height of 5 feet above the ground. The existing Pit 1 is shown in **Photo 1**.

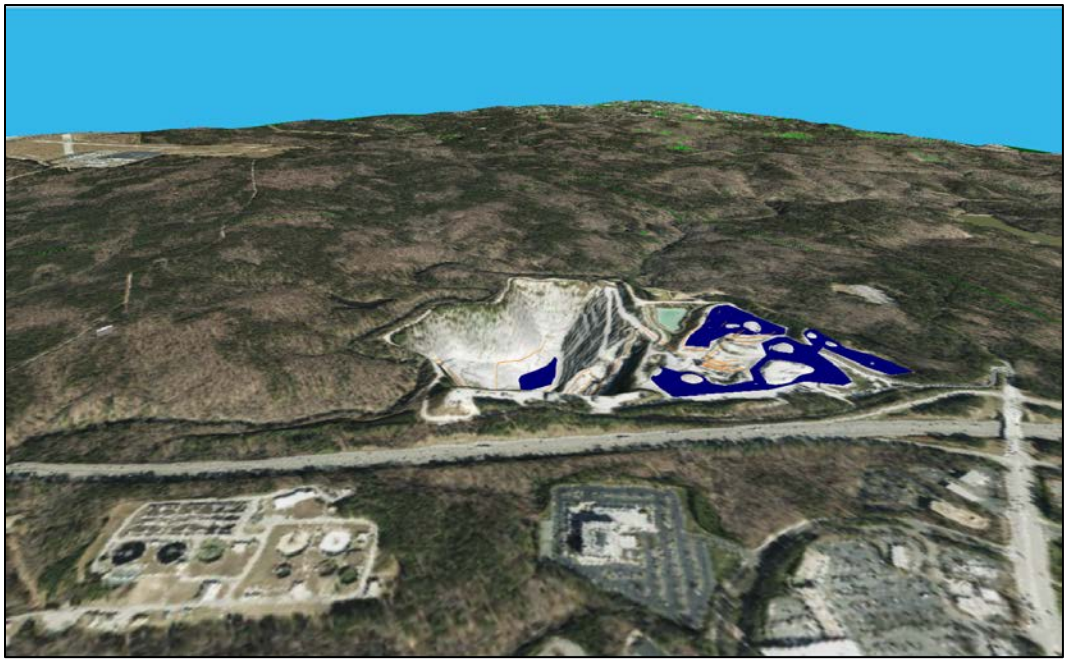
As shown in **Figure 4**, the Cadna-A base model for the project was developed by importing geo-referenced aerial imagery along with topographic contour data in 2-foot intervals. The topographic contour data was provided by Wake Stone for the quarry areas and current North Carolina One-Map Lidar data was used for the surrounding regions of the study area.

Conservative worst-case noise assumptions were used in populating the model. For example, all noise-producing equipment were assumed to be operating simultaneously; leaves were assumed to be off the trees, so areas with foliage were not included; and a "favorable wind condition" was assumed in the model. The Cadna-A base model was then configured to estimate noise levels generated by the quarry operations for the following three conditions:

- **Existing Production** – included the current production activities in Pit 1, hauling of rock to the primary crusher, and typical crushing, plant, and yard operations.
- **Future Overburden Clearing** – included clearing of overburden at the expansion Pit 2 and hauling of overburden to the storage area on the west side of Pit 1. This condition also included the same typical crushing, plant, and yard operations as the Existing Production condition.
- **Future Production** – included production at the expansion Pit 2 and hauling of rock to the primary crusher. This condition also included the same typical crushing, plant, and yard operations as the Existing Production condition. The Future Production condition was further divided into four scenarios (280-foot, 266-foot, 210-foot and 160-foot) below grade based on the elevation of projected working benches in the expansion Pit 2.

Photo 1. Existing Pit 1 at Wake Stone Quarry

Figure 4. Perspective View of Cadna-A Noise Model (Looking Northeast)



6. NOISE MODEL RESULTS

Once the Cadna-A model was fully populated, it was allowed to run to compute resulting sound levels for the various quarry operating conditions at eight discrete receptor locations (R-#) in Umstead State Park, as shown in **Figure 2**. Six of the receptors were selected to correspond with the long-term noise monitoring sites, and another two receptors were added in response to requests from DEMLR. The results are summarized in **Table 2** and are expressed as typical hourly equivalent sound levels (Leq(1hr)) in A-weighted decibels (dBA). Again, the results shown in the table represent realistic worst-case conditions that assume all quarry equipment is running simultaneously.

As can be seen in **Table 2**, sound levels from future Pit 2 operations are expected to range from 31 to 55 dBA Leq(1hr) across all eight discrete receptor locations in Umstead State Park. Naturally, the louder sound levels will occur closer to the quarry work, and the quieter sound levels will occur farther

away. This range of anticipated sound levels compares very closely with the sound levels estimated for the existing quarry operations in Pit 1 which range from 31 to 52 dBA Leq(1hr).

The results in **Table 2** for receptors R-2 and R-3 were of particular significance from the point of view of ensuring that the Cadna-A noise model was calculating correct noise levels. Receptors R-2 and R-3 were the closest to Wake Stone's existing work in Pit 1. As such, it would be reasonable to expect that the measured and modeled noise levels at these two receptors should match relatively closely. As can be seen, the model is nearly perfectly calibrated with the measured noise results for existing noise during production hours. Thus, these results provided confidence that the Cadna-A model could be relied upon to predict accurate future noise levels as well.

Table 2. Predicted Existing and Future Sound Levels for Quarry Operations

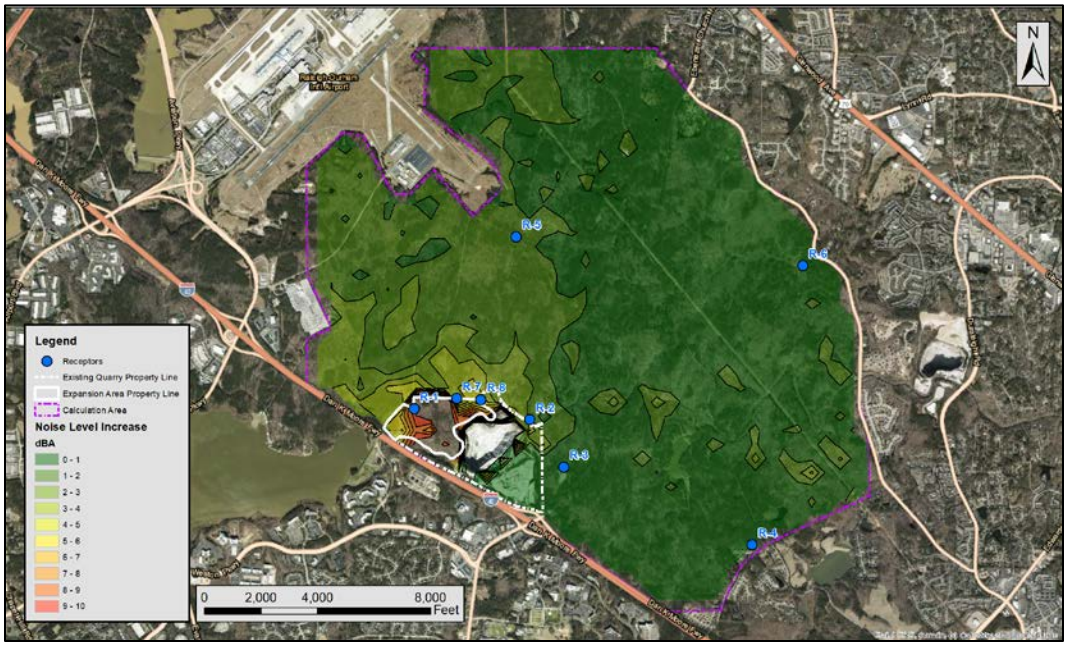
Receptor	Measured	Predicted Average Hourly Noise Level, dBA Leq(1hr)						
	Existing Production dBA Leq	Existing Quarry	Overburden Stripping	Production 280 ft	Production 266 ft	Production 210 ft	Production 160 ft	Existing I-40 Traffic
R-1: Residence Property Line	LT-3: 55	46	49	49	48	47	46	58
R-2: Company Mill Trail	LT-2: 50	50	51	52	52	52	52	38
R-3: Picnic Area	LT-1: 53	52	52	52	52	52	52	50
R-4: Residences	LT-5: 51	35	35	35	35	35	35	47
R-5: Reedy Creek Park Trail	LT-4: 52	37	38	39	39	38	38	39
R-6: North Turkey Creek Trail	LT-6: 47	31	31	31	31	31	31	29
R-7: Foxcroft Lake	N/A	50	55	53	53	52	52	45
R-8: Crabtree Creek	N/A	48	49	50	50	50	50	38

Consequently, using the noise levels in the third column (Existing Quarry) of **Table 2** as the existing baseline noise level, WSP concluded that noise levels associated with Wake Stone's future operations involving Pit 2 were expected to remain well below the selected 10-decibel increase criterion, and **thus will <u>not</u> pose a *"significantly adverse [noise] effect on the purposes of a publicly owned park, forest or recreation area [in Umstead State Park]".***

7. SOUND ISOPLETH CONTOURS

The Cadna-A model also produces sound isopleth contour lines of equal loudness attributable only to Wake Stone's noise production (i.e. not including any other background noise sources). The purple dashed line around the outside shows the extents of Umstead State Park and the area within which the sound contours were computed. **Figure 5** shows isopleth contour areas for the delta or <u>difference</u> between the sound levels produced in the future versus existing quarry operating conditions. The contours are shown in 1-decibel increments represented by the color gradient in the legend. As can be seen in the three shades of green, the vast majority of Umstead State Park was expected to experience a noise increase of less than 3 decibels due to Wake Stone's operations expanding from Pit 1 to Pit 2. In fact, more than half of the park was expected to experience an increase of less than 1 decibel.

Figure 5. Predicted Isopleth Sound Difference Contours (Future – Existing)



8. PERMIT DENIAL

In preparing their application, Wake Stone worked closely with DEMLR for well over a year to assuage their concerns with noise and voluntarily agreed to constructing an extensive noise wall along the north and west sides of Pit 2 to reduce noise in Umstead State Park as much as possible. Despite these efforts and WSP's acoustical analyses which concluded that future noise in Umstead State Park would not be a "significantly adverse effect on the purposes of a publicly owned park, forest or recreation area", DEMLR denied Wake Stone's permit application to begin mining in Pit 2. In the denial letter, DEMLR briefly cited traffic and visual issues, but their main reason for the denial was due to noise.

Understandably, Wake Stone was shocked, dismayed, and angered at the last-minute denial decision, especially because Wake Stone had been given assurances that the permit would be granted by DEMLR's chief engineer. But the decision to deny the permit was made by DEMLR's Director for unknown reasons. Consequently, Wake Stone chose to challenge the permit denial in court by suing DEMLR for having made an erroneous arbitrary and capricious decision.

9. THE TRIAL

After months of additional noise analyses, givings of sworn legal depositions, and strategic planning, the trial was finally set to begin on 2/14/23. The bench trial (judge only) was held in the North Carolina Office of Administrative Hearings, as shown in **Photo 2**, and was recorded as Case Number 22 EHR 00952. Fortunately, from Wake Stone's perspective, the Chief Judge had a solid background in science (Ph.D. in chemistry and background in environmental science).

DEMLR, being a state agency, was represented by the North Carolina Attorney General's Office, and had their own acoustical consultant to testify as an expert witness on their behalf. WSP was the acoustical expert witness representing Wake Stone.

The trial was comprehensive and exhaustive; taking nearly two weeks to complete. Both sides called up their witnesses for "direct" and "cross" examinations. Several witnesses were recalled later as the trial proceeded (including WSP) to provide more "redirect" and "recross" testimony. There were

site maps, noise reports and models, conversations, depositions, and new testimony presented by both sides; all of which was presented on a large screen TV in the courtroom for all to see.

Photo 2. Courtroom Setting
(Wake Stone lawyers on right side, State lawyers on left side)

10. THE COURT'S FINDINGS

After the two-week trial, it took approximately six months for the judge to deliberate and come to a ruling, during which time both sides provided the judge with written closing summaries to act as drafts for the judge's ruling. The Final Decision, dated 8/11/23, ruled in Wake Stone's favor and found that the State (DEMLR) had acted arbitrarily and capriciously in their denial of Wake Stone's expansion permit. In fact, the decision read like a total admiration of Wake Stone and a castigation of DEMRL. Obviously, Wake Stone was very pleased with the Decision. Some of the Court's Decision verbatim language included:

- [Opposing Expert] conducted no field measurements, calculations, or sound modeling of noise in the Park.
- [Opposing Expert] indicated that WSP's use of the Cadna-A model was appropriate, [but] he has never conducted any Cadna-A modeling.
- The [Court] finds that [Opposing Expert] lacks impartiality.
- [Opposing Expert] was critical of [DEMLR] Director's acoustical analysis in the denial memo.
- The Application was pending before [DEMLR] for 681 days before [DEMLR] Director...issued Respondent's written decision denying the Application.
- [DEMLR] Director did not have any acoustical training on which to base his decision that the 10 dBA [relative increase] standard was not appropriate.
- The [Court] finds that [DEMLR] Director was evasive when questioned about whether [DEMLR] accepted the [WSP] Acoustical Study results and intended to rely on them, but the record makes clear the results were accepted by [DEMLR] and that [DEMLR] relied on them.
- [DEMLR] never asked [Opposing Expert] for any information or consulted with him during its review of the Application.
- [DEMLR] Director knew the mathematical calculations performed by State Mining Engineer in applying the safety factor were incorrect.

- [DEMLR] Director removed the State engineer's conclusion that "The noise created by this [proposed] expansion will not have a significant adverse effect on the purposes of Umstead State Park." [and then pressured the State engineer to revise his findings].
- [DEMLR] Director acknowledged that there was "quite a bit of internal documentation" contradicting his decision to deny the Application.
- [DEMLR] Director has no engineering degree, no graduate degree, no mining experience, and no licenses or certifications.
- As to noise impacts, [DEMLR] Director denial memorandum rejected both the conclusion of the [WSP] Acoustical Study and the recommendation of the State Mining Engineer that noise would not have a significantly adverse impact on Park purposes.
- [DEMLR] Director could not quantify what area of the Park he believed would experience a "predicted worst case scenario" 6 to 7 dBA increase in noise. [WSP] quantified that area as 1.24 acres or 0.02% of the Park's total acreage.
- [DEMLR] Director could not identify how the Park's purposes of recreation, conservation, or education are carried out in that area of the Park or how it would be affected by the noise from the proposed mining operation.
- In his denial memorandum, [DEMLR] Director also applied an absolute threshold of 55 dBA [Ldn]. He chose this threshold because it was the standard used in the 1980 noise impact analysis done for [Wake Stone] Petitioner's original permit, based in turn on the standard used in a 1970 analysis of noise impacts to the Everglades National Park.
- [DEMLR] Director never communicated the 55 dBA [Ldn] standard to [Wake Stone] Petitioner or WSP.
- [DEMLR] failed to produce any evidence that [State] Secretary ever issued a proper delegation of authority to [DEMLR] Director….as required by the Mining Act and the Executive Organization Act.

11. THE COURT'S RULING

In this case, the Court cited established law that (1) "Administrative agency decisions may be reversed as arbitrary or capricious if they are "patently in bad faith" or "whimsical in the sense that they indicate a lack of fair and careful consideration or fail to indicate any course of reasoning and the exercise of judgement."; (2) "An agency's denial of a permit is arbitrary or capricious where it is based on "speculative assertions" or "mere opinion evidence" rather than competent substantial evidence", and (3) "An agency's permit denial also is arbitrary or capricious where the agency applies a factually unsupported or unreasonable standard." – all of which applied to DEMLR's decision to deny Wake Stone's permit application.

The Decision found that "[DEMLR] Director denial of the Application on the grounds that the proposed expansion would have a significantly adverse effect on the purposes of the Park through noise, visual, and traffic impacts was arbitrary or capricious." And finally, ***"This [Court] finds that it would be difficult to imagine a set of facts more demonstrative of an arbitrary and capricious government action. The abrupt and unsupported finding with respect to noise is precisely the type of governmental action that the statutory and regulatory application review process was designed to prevent, and the Administrative Procedures Act was enacted to correct. Thus, Respondent's denial of the Application was arbitrary and capricious under N.C. Gen. Stat. § 150B-23(a)(4)."***

Thus, the Court ordered that "[DEMLR] is hereby ordered to grant the modified [Mining] Permit 92-10 within thirty days from the date of this decision [which was issued on 9/8/23], incorporating the proposed sound wall as mitigation.….as last agreed to by [Wake Stone]. [DEMLR] also is ordered to pay [Wake Stone's] reasonable attorneys' fees."

This was a significant finding the set law precedence in North Carolina. The local newspapers and mining industry journals carried the news to the public, as shown in **Figure 6**. Thus, Wake Stone was allowed to advance their plans to develop Pit 2 with an expected total life revenue of **$500 Billion**.

Figure 6. Local Newspaper Article Announcing Wake Stone's Victory

12. LESSONS LEARNED

There are many lessons for acousticians to be learned and to heed in this case. They include:

- Be sure of your methods, equipment, models, and the credentials of any staff involved.
- Be aware that all of your notes, reports, and client correspondences are subject to disclosure.
- Testify only to the "acoustical truth" as you know it to be. Do not exaggerate or embellish.
- Do not criticize your expert opposition in a personal manner. Keep it all professional.

In addition, the primary author wishes to express the following:

- Government overreach is insidious and can be found everywhere. Politics can, and often do, influence governmental decisions. Fortunately, the courts can overturn abuses of power.
- Treat every acoustical project as through it might end up in court someday where you'll need to defend it. Sooner or later, you'll be right.
- Always maintain the highest standards and practices expected of us acoustical engineers. Prioritize our industry first, your company second, and yourself third.

13. ACKNOWLEDGEMENTS

The authors wish to acknowledge the superb technical performance and valuable input provided by Emily Robinson (WSP) who performed all of the noise measurements, and Cole Atkins (Wake Stone) who was the main point of contact and who provided all the technical details of Wake Stone's existing operations and future plans.