

July 22<sup>nd</sup>, 2022

# RE: PL2022178 - Noise levels for proposed McBee's Coffee N Carwash

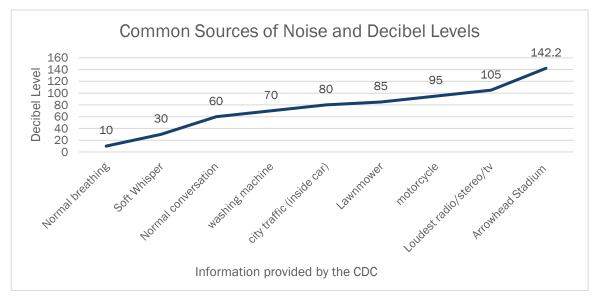
Dear Recipient(s),

As discussed at the July 14<sup>th</sup>, Lee's Summit Planning Meeting, the city ordinance maximum for noise at commercial businesses is currently 65 decibels (dB). A concerned citizen, but still in favor of the project, brought to light that the proposed McBee's Coffee N Carwash may exceed this ordinance. While there was no data available during the planning meeting from the applicant, the Preliminary Development Plan was still approved to go to council under the condition that the applicant would provide noise level information before the scheduled city council meeting. While it was difficult to find an available Acoustics Engineer in a timely manner, luckily the McBee's have pulled their resources together to gather the appropriate information shared within this letter and related attached documents.

## **COMMON DECIBAL LEVELS**

Before diving into the sound meter readings, it is important to know the basics of sound to be able to analyze this case appropriately. The CDC states on their website, "A whisper is about 30 dB, normal conversation is about 60 dB, and a motorcycle engine running is about 95 dB." I have provided the below chart to makes these readings even more real and comparable to things we often hear. While the city ordinance is limited to 65 dB, that is only slightly higher than a normal conversation of two people standing a few feet apart from one another. For some businesses, there is no way to always keep the noise under this limit when outside factors as simple as cars passing by can easily throw off the sound meter. In this letter we will evaluate readings with and

without
existing
conditions,
factors that
may be
involved, and
the buffers
we have in
place to
control noise
coming from
the carwash
equipment
and turbines.





# McBEE SOUND METER READINGS

Attached to this letter includes noise level readings from the two existing McBee's Coffee N Carwash locations that recently opened in Belton, Missouri and North Little Rock, Arkansas: Both off main throughfares and very similar in size to the proposed wash in Lee's Summit, Missouri. Current conditions at the proposed location have also been recorded to serve as a comparison. You will notice the North Little Rock location has very detailed information pertaining to peak weighted sound pressure levels and worker's exposure. While this additional information is greatly helpful to the owners, for the sake of this letter I will be referring mostly to the instantaneous readings and the maximum sound level reached (Lmax) within the one-minute recording. The instantaneous reading is recorded with no perceived activity occurring nearby, so as quiet as the area was perceived to be. The maximum levels consider all activity such as cars driving by, blowers being used in the tunnel, and any surrounding noise. All readings have been conducted with meters that meet OSHA standards at minimum.

# MANUFACTURER TURBINE METER READINGS

Also attached are sound level meter readings directly from our equipment manufacturer,

	Stalls		
	per	# Of	HP of
	turbine	turbines	turbine
LS, MO	10	2	40
Belton, MO	6 & 7	2	30
NLR, AR	12	1	50

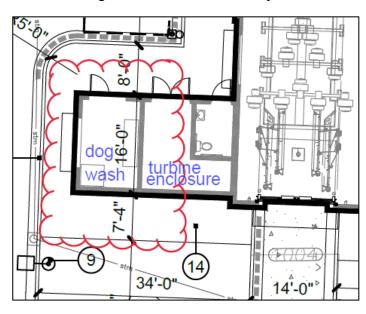
Vacutech. Two turbines were tested with different horsepower. The higher of the two was forty (40) horsepower, taken outside of a cinder block enclosure with no roof. There was also a test done with a thirty (30) horsepower turbine, not enclosed whatsoever. These meter readings were taken in a controlled environment so that no outside noise

would interfere with the readings. The enclosed forty (40) horsepower turbine readings would be most like what we will see in the proposed Lee's Summit location, as the chart to the left shows. This report shows the highest reading to be 60 dB; all readings are well under the city limit of 65

dB. As mentioned, this test was done within an enclosure, however the enclosure in this instance did not have a roof or any additional buffering measures in place.

#### **SOUND BUFFERING**

The McBee's have gone above and beyond in their design process to ensure that noise will not hinder the site or its neighbors. Not only will both of our proposed turbines be enclosed within eight-inch concrete block (8" CMU) walls, but they will also be fully enclosed with a roof overhead. Unintentionally in our latest building revision, an additional buffer will now





be in place for our Lee's Summit and all future locations. The dog wash was moved to the opposite side of the building and will be enclosed for better site flow and animal safety. Luckily for us in this instance, it also creates an additional layer of sound buffering to the site. While this design is not existing at any of our open locations to be able to take sound meter readings, we anticipate that this will potentially lessen any noise coming from the turbines by a few more decibels. With the manufacturer-controlled readings and the additional buffers we have in place, we do not foresee any issues pertaining to the noise of the vacuum turbines once operational.

# SOUND ATTENUATION ('DROP OFF LEVEL')

Another main question proposed to McBee's Coffee N Carwash at the Planning Committee meeting was regarding the sound attenuation, commonly known as the 'drop off level'. How far you can hear sound depends on many factors such as frequency, how the particular noise spreads out as sound travels, and whether or not there are any obstacles between the sound and the listener that may dampen the sound.

Logically, the further you are from the source of a sound, the more that sound's intensity will decrease and the less loud you will perceive it. According to engineers, you will generally be able to hear a 100 dB sound at a maximum of 16 meters or about 52 feet. Measurements were taken

from the Jackson
County Geographical
Information System,
which show that the
closest residential home
from the proposed
tunnel exit location in
the rear will be just
under 600 feet. The
maximum sound coming
from the carwash
according to our own
readings is just over 92
dB right as a car exits



the wash tunnel. By following the rule referenced above and calculating the sound attenuation, at 600 feet away, those neighbors are going to hear about 37.4 dB from the wash, *or just louder than a soft whisper*. Please note, this calculation does not factor in sound related to traffic or any other outside interference.

At the proposed Lee's Summit location, I took readings of the existing conditions at the nearest subdivision entrance of the residential homes (at Manor Lake Drive). The maximum as cars and trucks passed by on Highway 150 was 58.2 dB. The attenuation calculator projected this reading



to have been more in the 25-30 dB range because of the distance from the highway. The additional 20 to 30 decibels our readings showed were most likely being generated from music from cars filling up at the gas station in front (next door to the proposed location) and sound from neighbors in proximity. If one of those neighbors were to be mowing their lawn (typical lawnmower puts out 85 dBs), this would have thrown off the maximum level even further. It's important to remember that there is a large amount of interference always going on with these readings and there will continue to be even once a location is operational.

## TRAFFIC NOISE COMPARISON

The Lee's Summit property falls in the middle of the Belton and North Little Rock averages of daily traffic counts according to the Department of Transportation along each main throughfare. The proposed Lee's Summit location shows about 5 to 10,000 cars east bound Highway 150, and 10 to 20,000 cars headed west bound Highway 150 on the MODOT traffic count map daily. At the property line facing the main thoroughfare on each site, the instantaneous level of noise was recorded at about 60-62 dB, when no cars were passing by. The Lmax (maximum) level of 79 to 82 dB was recorded as cars, large trucks, and delivery vehicles were driving by the site. A single vehicle driving by on Highway 150 instantly caused a higher reading than the city's commercial limit of 65 dB at the property line. There are residential homes on the southern, or east bound side of Highway 150, across from the proposed carwash. As presented during the planning meeting, these few homes are setback over 150 feet away minimum from the highway. When the initial noise questions came up at the Planning Meeting, the neighbors to the south were not a great concern. It is fairly assumed that the residential homes across the carwash on the southern side of the highway, will not be affected by any residual sound that the carwash produces since the distance and cars passing by already 'wash' any distant sounds away.

# **MOST 'REAL WORLD' READING**

At Belton I was able to take a reading in the middle of the vacuum stall area, which I believe would be the best real-world comparison of how the proposed Lee's Summit location will sound like on a typical day. Belton's site plan is most like Lee's Summit proposed plan with vacuum stalls on both sides of the driveway, two turbines with similar (slightly less) horsepower, and

traffic counts about the same on the main frontage. There were cars continuously going through the wash during the hour that I was on site taking readings. Both turbine doors were closed as they normally should be. With the extreme Missouri heat, there were less people than normal vacuuming their cars; luckily, I was still





able to catch a reading with three people vacuuming. With all these factors, the reading was 70.7 dB in the middle of the vacuum area. While it was still over the city limit, it was not far off considering there were vacuums and traffic whirling around the site.

As normal, I was able to have a conversation with an employee passing by at a comfortable noise level. In no way were we trying to yell over the surrounding noises. Top notch customer service is a huge part of McBee's Coffee N Carwash employee standards. There is typically a wash tech assigned to the vacuum area simply to check over customer's cars once they are out of the wash, sign people up for memberships, and tidy up the area constantly. Wash techs can easily interact without worrying about interfering noise from the carwash.

I believe the only other area of concern that one may have would be the noise levels during our absolute busiest hours of operation. While Belton continuously had cars running through the wash during readings, there are times on Saturdays which cars can be back-to-back, squeezed in on the conveyor belt system, in turn using most or all the vacuum stalls simultaneously. I would encourage the council to consider the overall increase in noise during a weekend (such as lawns being mowed, music coming from cars, and increased traffic on the highway). Not only would the wash be creating the maximum possible level, but all other noise would also be at its highest as well. This goes to say for any other car wash or commercial business. Our car wash will be operating during normal waking hours, 7 AM to 9 PM on most days. The customer traffic and noise being generated from the wash is unlikely to ever be severe at 7 in the morning or after 7 in the evening when most neighbors would consider it a nuisance.

While it is possible that the proposed McBee's Coffee N Carwash could be over the city's sound limit of 65 dB at times, due to our proximity of residential neighbors and considering drop off levels with existing conditions, we do not feel that we will be a burden to the community. McBee's is committed to producing a development which values the needs of its surrounding neighbors. Thank you very much for taking the time to review this information and we appreciate your consideration of this proposed development. For more information or questions for McBee's, please refer to the applicant's contact information below or visit our website at McBeeCNC.com.

Thank you,

Ashley E. Smith

Preconstruction Project Manager (816) 898-6454 ASmith@McBeeCompanies.com



#### **SOUND LEVEL METER READINGS**

MODEL: FT-DD-T440HP3 (40hp T4 VACSTAR TURBINE VACUUM PRODUCER)

**READING ONE**: 60 DB-A, 3 FEET FROM TURBINE @ 45° ANGLE

AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING TWO: 56 DB-A, 10 FEET FROM TURBINE @ 45° ANGLE

AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING THREE: 51 DB-A, 20 FEET FROM TURBINE @ 45° ANGLE

AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING FOUR: 44 DB-A, 30 FEET FROM TURBINE @ 45° ANGLE

AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

<u>NOTE</u>: THESE READINGS WER<mark>E TAKEN OUTSIDE OF 8'x10'x8' CINDER BLOCK ENCLOSURE WITH CONCRETE SLAB AND NO ROOF.</mark>

#### SOUND LEVEL METER USED:

SIMPSON MODEL #40003 – MSHA APPROVED.

MEETS OSHA & WALSH-HEALY REQUIREMENTS FOR NOISE CONTROL.

CONFORMS TO ANSI S1.4-1983, IEC 651 SPECS FOR METER TYPE.

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WEB SITE: vacutechllc.com



#### **SOUND LEVEL METER READINGS**

MODEL: FT-DD-T330HP4 (30HP TURBINE VACUUM PRODUCER)

READING ONE: 69 DB-A, 10 FEET FROM TURBINE @ 45° ANGLE

AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING TWO: 54 DB-A, 20 FEET FROM TURBINE @ 45° ANGLE

AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING THREE: 38 DB-A, 30 FEET FROM TURBINE @ 45° ANGLE

AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

#### **SOUND LEVEL METER USED:**

SIMPSON MODEL #40003 – MSHA APPROVED.

MEETS OSHA & WALSH-HEALY REQUIREMENTS FOR NOISE CONTROL.

CONFORMS TO ANSI \$1.4-1983, IEC 651 SPECS FOR METER TYPE.

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Lee's Summit Proposed McBee's Coffee N Carwash Location

#### 1295 SW Arborwalk Blvd., Lee's Summit, MO

Projected Turbine Horsepower: 40 (2 TURBINES ON SITE, 10 VACUUM STALLS PER TURBINE)

Date: 7/19/22	Instantaneous Level	LAmax	
Α	59.7	61.5	Back of lot
В	56.8	60.9	Back of lot
С	62.2	79.3	along HWY 150
D	60.3	82.1	along HWY 150, nearest traffic light
P -Closest residential	55.3	58.2	~600ft away from tunnel exit- Manor Homes entrance (SW Manor Lake Dr behind Meiners)
Q - 2nd closest	52.5	55.5	~800ft away from tunnel exit- Arbor Park entrance (SW Arbor Park Dr)
R -3rd closest	57.2	64.5	~1500ft away from tunnel exit- Near SW Ward Rd & Arbor Mill subdivision

TESTED WITH VLIKE VL6708 DIGITAL SOUND LEVEL METER CONTINUOUSLY FOR 1 MINUTE

### McBee's Coffee N Carwash

### 590 E. North Ave. Belton, MO

Turbine Horsepower- 30 (2 TURBINES ON SITE, 6-7 VACUUM STALLS PER TURBINE)

Date: 7/19/22	Instantaneous Level	LAmax	
Α	55.7	57.9	
В	57.9	60.2	
С	62.8	67.9	along North Ave (main thoroughfare)
D	65.3	70.1	along North Ave (main thoroughfare)
E	58.1	61.2	
F	62.9	70.7	middle of vacuum stall area
G	70.5	71.7	Outside of Turbine #1 door closed
H -TURBINE #1 *	76.2	87.2	Inside Turbine #1 door closed
I	86.5	92.5	outside tunnel at exit
J	105.5	108.1	Inside tunnel at exit (reader was in middle of blowers with car going thru)
K	65	97.4	
L	61.2	85.7	
M	50.9	59.9	
N - TURBINE #2 *	74.4	81.5	Inside Turbine #2 door closed
0	69.1	69.9	Outside of Turbine #2 door closed

TESTED WITH VLIKE VL6708 DIGITAL SOUND LEVEL METER CONTINUOUSLY FOR 1 MINUTE

<sup>\*</sup>REFER TO VACUTECH SOUND LEVEL METER READINGS FOR MOST ACCURATE TURBINE INFORMATION

McBee's Coffee N Carwash

#### 4315 E. McCain Blvd., North Little Rock, AR

Turbine Horsepower- 50 (1 TURBINE ON SITE, SUPPORTS 12 VACUUM STALLS)

	I					_	
Date: 7/19/22	Instantaneous Level	LAeq	Lmax	LCpeak	TWA	Dose	Projected Dose
Α	57.3	96.8	125.7	N/A	47.9	0.00%	8%
В	60.8	61.8	75	N/A	N/A	N/A	N/A
С	64.3	66.9	85.2	109.3	N/A	N/A	N/A
D	65.7	67.8	85.9	101.8	N/A	N/A	N/A
E	75.6	74.2	81.6	104.2	N/A	N/A	N/A
F	70.4	67.4	78.7	104.2	N/A	N/A	N/A
G	84	83.3	85.8	107	56.5	0.10%	67.90%
H -TURBINE*	89.8	90.2	92.6	114.1	63.3	0.70%	327.90%
1	67.1	87.3	92.4	105.5	60.6	0.40%	169.10%
J	73.4	69.7	80.6	95.9	N/A	N/A	N/A
К	68.7	68.8	88.4	100.4	35.1	0.00%	0.50%
L	61.5	62.3	72.4	97.4	N/A	N/A	N/A
М	60.3	63	79.3	102.1	N/A	N/A	N/A

At back corner of lot, max thrown off by neighboring property

along McCain Blvd (main thoroughfare) along McCain Blvd (main thoroughfare) Closest to McCain Blvd (main thoroughfare)

Outside exit door

Detailed readings provided with calibrated and approve NIOSH sound meter.

TESTED WITH NIOSH SLM SOUND METER CONTINUOUSLY FOR 1-MINUTE

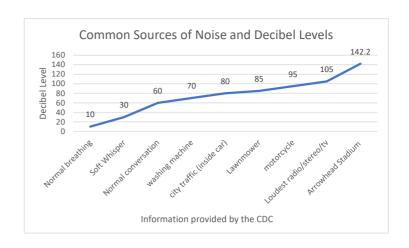
<sup>\*</sup>REFER TO VACUTECH SOUND LEVEL METER READINGS FOR MOST ACCURATE TURBINE INFORMATION

# **KEY OF POINTS MEASURED ON SITE PLAN**

OI I OIIII OIII I IOOIIL	011011212711	
Α	Corner of Lot	Away from traffic
В	Corner of Lot	Away from traffic
С	Corner of Lot	Along main throughfair/traffic
D	Corner of Lot	Along main throughfair/traffic
Е	Corner of lot	Near Tunnel Exit
F	Middle	Vacuum Stall Area
G	Outside enclosure	Turbine #1 (door closed)
Н	Inside enclosure	Turbine #1
1	Outside	Tunnel Exit
J	Inside	Tunnel Exit (near dryers)
K	Inside	Tunnel Entrance
L	Outside	Tunnel Entrance
M	Outside	Pay Station Kiosk/Customer Interaction
N (Belton only)	Inside enclosure	Turbine #2 & dumpster area
O (Belton only)	Outside enclosure	Turbine #2 & dumpster area (door closed)
P (LS only)	Closest Residential	
Q (LS only)	2nd Closest Res.	
R (LS only)	3rd Closest Res.	

### **Common Sources of Noise and Decibel Levels**

Normal breathing	10
Soft Whisper	30
Normal conversation	60
washing machine	70
city traffic (inside car)	80
Lawnmower	85
motorcycle	95
Loudest radio/stereo/tv	105
Arrowhead Stadium	142.2



https://www.cdc.gov/nceh/hearing\_loss/what\_noises\_cause\_hearing\_loss.html

