NOISE ASSESSMENT REPORT

Wallis Sand & Gravel Mine
Johnson and Hanson Roads
Town of New Haven
Oswego County
State of New York

Applicant:

W.D. Malone Trucking & Excavating

708 County Route 7
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Prepared By:

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1.0 INTRODUCTION

In response to recent New York State Department of Environmental Conservation (NYSDEC) project review comments and as part of the State Environmental Quality Review Act (SEQRA, the following report describes a noise assessment for the 63.3 acre parcel owned by W.D. Malone Trucking & Excavating, Inc., in the Town of New Haven, Oswego County. The subject mine site consists of an entire Life of Mine (LOM) area of 36 +/- acres located at the intersection of Johnson Road and Hanson Road. The proposed mining operations will consist of the removal of overburden soil and mining operations that will involve sand and gravel excavation along the reaches of the (LOM) boundary. The noise impact evaluation will review potential sound levels from the construction, mining and associated equipment, as well as potential impacts, to receptors in the vicinity of the mine site. Proposed sound mitigating measures include the construction of two berms on both the north and south sides of the site. The purpose of this assessment was to determine whether the proposed mine site will substantially increase sound levels (noise) perceived by sensitive receptors in the area.

2.0 BACKGROUND

Noise is defined as any unwanted sound. Excessive noise can cause annoyance as well as adverse health effects related to inner ear damage. Annoyance can include sleep disturbance and speech interference. It also can distract attention and make activities more difficult (USEPA, 1978).

The range of pressures that can cause the vibrations that create noise is broad. Noise is measured on a logarithmic scale, expressed in decibels, (dB). The frequency of sound is the "pitch", which correlates to the rate of vibration of an object in air. The unit of frequency is hertz (Hz). Most sounds are comprised of multiple frequencies, and of these frequencies, the normal human ear can detect range from 20 Hz to 20, 000 Hz, although most people are sensitive to frequencies between 500 and 4,000 Hz. These individual frequencies can be combined into one overall dB level.

According to the NYSDEC Program Policy, dated February 2, 2001, and entitled, "Assessing and Mitigating Noise Impacts", "the environmental effects of sound and human perceptions of sound can be described in terms of four characteristics:

1. Sound Pressure Level (SPL may also be designated by the symbol L_p) or perceived loudness is expressed in decibels (dB) or A-weighted decibel scale dB(A) which is weighted towards those portions of the frequency spectrum, between 20 and 20,000 Hertz, to which the human ear is most sensitive. Both measure sound pressure in the atmosphere.
2. Frequency (perceived as pitch), the rate at which a sound source vibrates or makes the air vibrate.

3. Duration i.e., recurring fluctuation in sound pressure or tone at an interval; sharp or startling noise at recurring interval; the temporal nature (continuous vs. intermittent) of sound.

4. Pure tone which is comprised of a single frequency. Pure tones are relatively rare in nature but, if they do occur, they can be extremely annoying.

Another term, related to the average of the sound energy over time, is the Equivalent Sound Level or L_{eq}. The L_{eq} integrates fluctuating sound levels over a period of time to express them as a steady state sound level. As an example, if two sounds are measured and one sound has twice the energy but lasts half as long, the two sounds would be characterized as having the same equivalent sound level. Equivalent Sound Level is considered to be directly related to the effects of sound on people since it expresses the equivalent magnitude of the sound as a function of frequency of occurrence and time. By its derivation, L_{eq} does not express the maximum nor minimum SPLs that may occur in a given time period. It is generally shown as a parenthetic $L_{eq(8)}$ would indicate that the sound had been measured for a period of eight hours."

Noise is typically measured on the A weighted scale, commonly denoted as dB (A). The A weighted scale provides a good correlation with the human auditory response to sound pressure and is the most widely used descriptor for noise assessments. The lowest sound detectable to the human ear is 0 dbA, while conversely a sound level of 120 dbA typically causes pain. Some common sound levels are provided in Table 1: Common Sound Levels.

Table 1: Common Sound Levels (dB)

Source	Sound Level (dB)
Jet aircraft, 150 feet away	140
Threshold of pain	130
Threshold of discomfort	120
Chainsaw, 3 feet away	110
Disco, 3 feet from speaker	100
Diesel truck, 3 feet away	90
Curbside of busy road, 15 feet	80
Vacuum cleaner, 3 feet away	70
Conversational speech, 3 feet	60
Average home	50
Quiet library	40
Quiet bedroom at night	30
Background in TV studio	20
Rustling leaf	10

3.0 METHODOLOGY

3.1 Existing Conditions

The overall land use surrounding the proposed mine area may be described as remote rural roads sparsely populated with farms and rural dwellings. Site topography may generally be described as rolling hills with a steeper slope to the east of the site. The area of the proposed mine is partially located within a previously operated sand and gravel mine. The portion of the proposed mine outside of the previous mine area can be classified as wooded, with a mixture of young and mature forest. The nearest residence is located on Hanson Road approximately 160 feet to the south of the proposed site. The nearest residence to the west of the proposed site is approximately 210 feet from the LOM. There are no residences within one quarter mile to the north and east of the mine.

3.2 Ambient Sound Levels

Nearby receptors were verified through use of existing surveys, topographic maps and site visits. The location and distance of the nearest site receptors to the proposed mine are shown on Figure 1: Noise Monitoring Data. Noise readings were taken at multiple receptors near the site on November 2, 2011 by Ingalls & Associates, LLP, and are shown on Table 2. Five separate locations were recorded to obtain ambient noise levels close to possible receptors of noise from the proposed mine. The maximum noise levels observed were 78.7 dBA and 70.1 dBA along Johnson and Hanson Roads respectively. See Figure 1 for noise receptor location.

Table 2: Ambient Noise Level Readings

Minutes	Location A	Location B	Location C	Location D	Location E
1	38.75	38.00	36.05	34.55	37.35
2	36.00	44.65	36.05	38.25	33.85
3	39.65	50.10	41.10	49.20	41.70
4	48.60	37.60	37.65	47.35	37.75
5	35.00	38.50	52.00	36.85	34.50
6	36.30	37.60	35.75	36.60	44.10
7	40.15	36.70	34.45	36.05	35.85
8	38.00	42.70	36.55	38.15	36.10
9	38.00	37.65	47.90	35.70	34.50
10	37.10	35.85	35.70	51.35	34.65
Averages (dBA)	**38.76**	**39.94**	**39.32**	**40.41**	**37.04**
Min	35.00	35.85	34.45	34.55	33.85
Max	**78.70**	**59.10**	**48.30**	**70.10**	**58.20**

Date: November 2, 2011
Equipment Operating: None; Ambient Readings
Weather: 60° and Sunny
Monitoring Duration: 4:00 pm until 4:55 pm

Notes:

1. Maximum readings are instantaneous maximums throughout the time interval
2. Noise readings at Location A fluctuated significantly due to traffic from Johnson Road.
3. Noise readings at Location D fluctuated significantly due to frequent pet noises.
4. Only the first ten minutes of readings from the monitoring period are shown in Table 2 for illustrative purposes.

3.3 Inventory of Equipment

The following equipment or equivalent will typically be used for construction and mining operations:

Screen: Rawson Screener

Crusher: Pegson 2000 SR

Trucks: Tyrex Off-Road Dump Truck

Loaders: Wheel Loader (4 to 5 yard)

Excavator: PC-300 Komatsu Excavator

Dozer: Caterpillar D-8H

Although the screen and crusher are portable, they will be stationed in the center of the mine site for ease of access to the haul road and due to high internal mobilization costs. A minimum 1000' separation distance from the processing equipment (screen and crusher) to the nearest sensitive receptor shall be provided throughout the permit term. Given the nature of the material to be mined on-site (typically small diameter), it is expected that crusher will be used only sporadically, throughout the year as sufficient oversize material is generated. It is not anticipated that the crusher and screen will run simultaneously, as the crusher will be used infrequently.

4.0 ANTICIPATED CHANGE IN SOUND PRESSURE LEVELS

For the sake of comparison, Table 3 below lists the estimated sound pressure level of each piece of equipment. Presuming the equipment was operating at the limits of the Life of Mine, closest to the nearest sensitive receptor, extrapolated anticipated sound pressure level readings at the closest sensitive receptor are included within Table 3. Because existing vegetation surrounding the perimeter of the mine will remain in place, and because a 10' +/- topsoil berm shall be constructed at the limit of each active phase between the phase and the nearest sensitive receptor, additional sound attenuation can be expected which will further minimize potential effects on sensitive receptors.

Table 3: Anticipated Sound Pressure Level of Mobile Equipment at Closest Sensitive Receptors

Equipment	Max Sound Levels (in dB)	Distance (in feet) from LOM Boundary	Projected Noise*** South Dwelling (in dB)	Anticipated Reduction in Sound Levels Due to Vegetation (in dB)	Anticipated Reduction in Sound Levels Due to Berms (in dB)	Projected Noise*** South Dwelling (in dB) With Mitigative Measures in Place
Dozer*	85 @ 50'	200	73	-5	0*****	68
Truck*	84 @ 50'	200	72	-5	-15	52
Loader*	80 @ 50'	200	68	-5	-15	48
Excavator*	85 @ 50'	200	73	-5	-15	53
Screener**	87 @ 50'	1000	62	-5	-15	42
Additive Effect of Truck + Loader + Excavator****	88 @50'	200	76	-5	-15	56

* Per Table 9.1 within the U.S. Department of Transportation, Federal Highway Administration, Highway Traffic Noise.
** Screener sound level measurement per FHWA Roadway Construction Noise Model.
*** Per the rule of sound levels being inversely proportional to the doubling of distance between noise source and receptor [approximately 6dB (A) reduction in sound pressure level (noise) per doubling of distance] as discussed above.

**** Calculated per NYSDEC's Program Policy document entitled, "Assessing and Mitigating Noise Impacts" (February 2, 2001).
*****Because the dozer will be utilized to strip the topsoil and construct the perimeter topsoil berms, the noise reducing effects of the berm will not be realized during berm construction. Increased noise levels are unavoidable during initial stripping and construction of perimeter berms. However, because the dozer will only be used during initial stripping and subsequent reclamation, and not during typical day-to-day mining operations, all associated noise impacts will be negligible and short term. The dozer will not be operating in conjunction with the truck, loader, and excavator, which will be utilized during typical mining operations, and therefore, should not be included in the calculation of additive effects of multiple pieces of equipment.

5.0 MITIGATION

According to the NYSDEC's Program Policy document entitled, "Assessing and Mitigating Noise Impacts" (February 2, 2001), "the goal for any permitted operation should be to minimize increases in sound pressure level above ambient levels at the chosen point of sound reception. Increases ranging from 0-3 dB should have no appreciable effect on receptors. Increases from 3-6 dB may have potential for adverse noise impact only in cases where the most sensitive of receptors are present. Sound pressure increases of more than 6 dB may require a closer analysis of impact potential depending on the existing SPLs and the character of surrounding land use and receptors. Most humans find a sound level of 60-70 db(A) as beginning to create a condition of significant noise effect (EPA 550/9-79-100, November 1978). In general, the EPA's "Protective Noise Levels" guidance found that ambient noise levels of 55 dBA $L_{(dn)}$ was sufficient to protect public health and welfare and, in most cases, did not create an annoyance (EPA 550/9-79-100, November 1978)".

An average ambient noise level of approximately 40dbA was recorded as part of this noise assessment. However, the Town of New Haven code requires that noise levels be held below 60 dBA. Additionally, as stated above, the approximate noise level of a normal conversation is 60 dBA. Based on the Town Code and noise levels perceived as acceptable, a 60 dBA limit was used to review the potential increase in noise levels.

As seen in Table 3, the maximum potential sound level when mining activity is nearest the closest sensitive receptor, after incorporating the anticipated reduction in SPL achieved by the mitigating measures, is projected to be 56 dB, which is less than the 60 dBA limit imposed by the Town of New Haven. Several mitigating measures proposed and existing topographical conditions will continue to attenuate sound before reaching the receptors. Additionally, because the area surrounding the mine is so rural, ambient noise is typically quite low. However, factors completely unassociated with any mining operation (traffic, birds, planes, wind, pets, etc.) can raise noise levels to exceed noise levels anticipated during full mining operation.

Noise mitigating measures include an existing vegetative buffer and a proposed soil berm. Additionally, mining is proposed to descend into the earth creating an active mine face and topsoil storage berm between noise generators and nearby receptors. It is anticipated that these

additional measures will further reduce noise to achieve acceptable levels even to the closest neighbors.

Also shown in Table 3, the majority of equipment activity including crushing and screening will occur in the center of the proposed mine, approximately 1000 feet away from the closest receptor. While it is anticipated that the location of the portable screener will be moved throughout the mining process, a 1000' buffer shall always be provided between the crusher/screener and the nearest sensitive receptor. Throughout most of the construction and mining activities, equipment will not be operating at or near the southern property line. For example, if the excavator is operating in the center of the mine (approximately 1000 feet from the nearest receptor), the calculated sound level is only 60dBA at the nearest sensitive receptor. The only activities wherein an excavator may operate at or near the property line (thus potentially increasing perceived noise at nearby sensitive receptors) will be during the short interval of mining nearest to the receptor. Even for the short duration mining activity is close to the southern boundary, vegetation, a proposed earthen berm, and an active mining face will limit any potential perceived noise at the closest receptor.

Based on this information, sound pressure levels, or perceived noise, are not expected to significantly increase at the closest sensitive receptors as a result of proposed mining operations. It should also be known that mining operations will take place during normal business hours as stated in the Mined Land Use Plan. The proposed mining hours do not include nighttimes, holidays or Sundays, when noise impacts may have a more noticeable effect.

6.0 CONCLUSION

Based on the documentation and data reviewed, it is our professional opinion that there will be no adverse noise impacts on the nearby residences or any other sensitive receptors. This conclusion agrees with the rule of sound levels being inversely proportional to the doubling of distance between noise source and receptor [approximately 6dB (A) reduction in sound pressure level (noise) per doubling of distance]. Additional attenuation would also be expected due to the existing vegetation buffer (at least seasonally) and proposed soil berm between the proposed mine and residential receptors approximately 200 feet away from the closest point of the mine.

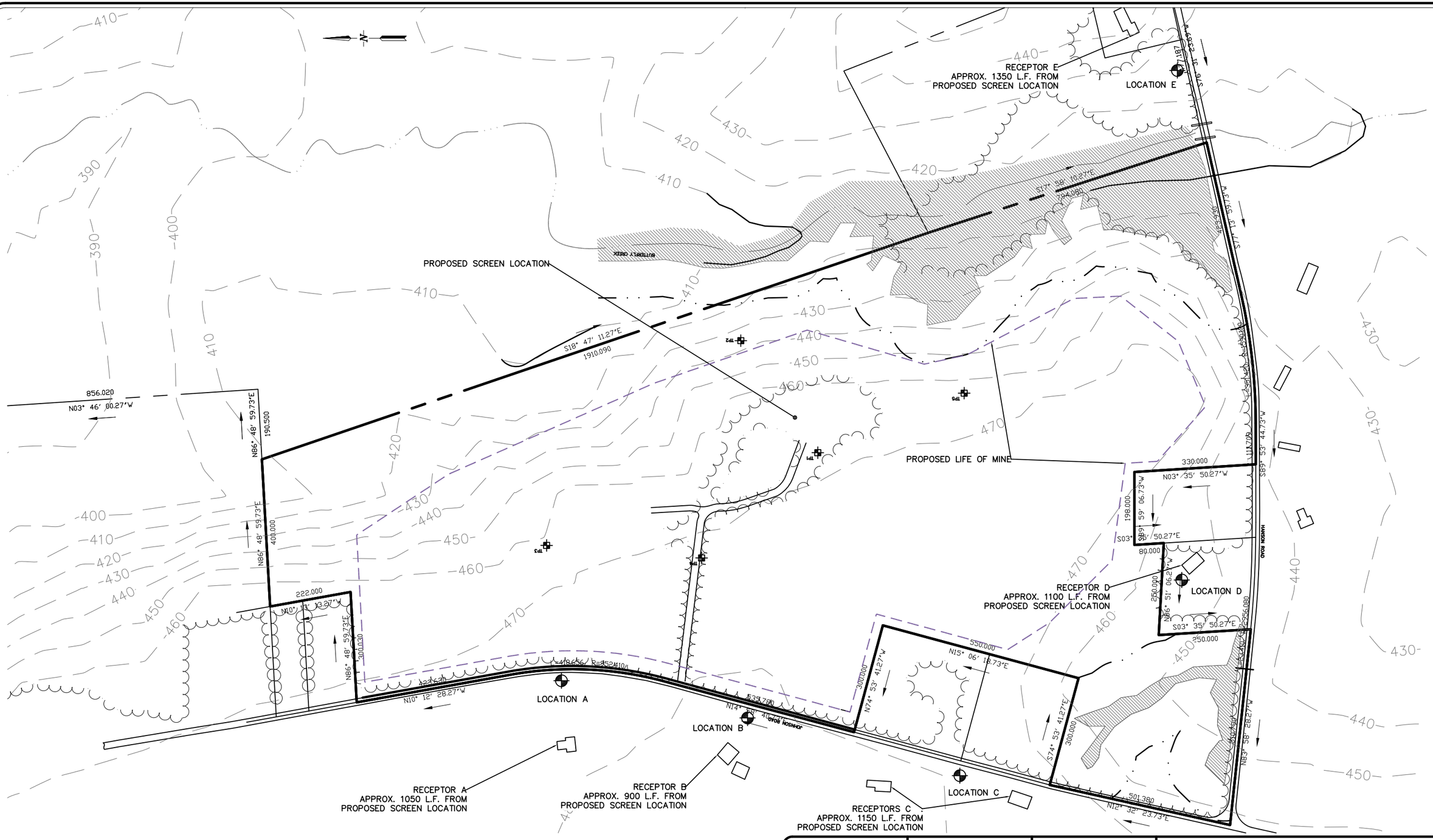
7.0 REFERENCES

NYSDEC Program Policy document entitled, "Assessing and Mitigating Noise Impacts" (February 2, 2001).

U.S. Department of Transportation Federal Highway Administration, Section 9.0 Construction Equipment Noise Levels and Ranges document entitled, "Highway Traffic Noise".

Figure 1

Noise Monitoring Data



NOTE: 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK TO LOCATE ALL UNDERGROUND UTILITIES. 1-800-962-7962

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NOISE MONITORING DATA

W.D. MALONE TRUCKING & EXCAVATING, INC.
WALLIS GRAVEL PIT
TOWN OF NEW HAVEN
OSWEGO COUNTY STATE OF NEW YORK

DATE: NOVEMBER 18, 2011
CHECKED BY: DFI
JOB NO. 11-116
SCALE: 1": 250'
DRAWN BY: C.D.L.
CADD FILE: 11-116 NOISE
SHEET 1 OF 1