Manitoba **Memorandum**

DATE: April 9, 2015

TO: Tania Steele

FROM: Eshetu Beshada, Ph.D., P.Eng.
Environmental Engineer
Municipal and Industrial Section
160 - 123 Main Street
Winnipeg, Mb R3C 1A5
Ph:204 945-7023

SUBJECT: **Urbanmine Inc. – Information for Public Registries**

Tania,

Please find attached additional information received with respect to the Urbanmine Inc file (5684.00) for distribution to the public registries. The documents included is:

- April 7, 2015 letter with attachment from Svent T. Hombach 68 pages

68 pages total

Thank you.

Eshetu Beshada, Ph.D., P. Eng.

FillmoreRiley

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Our File Number: 427312-1/STH
FRDOCS_4881043.1

April 7, 2015

VIA EMAIL

Manitoba Conservation and Water Stewardship
Environmental Stewardship Division
Environmental Approvals Branch
123 Main Street, Suite 160
Winnipeg, MB R3C 1A5

Attention: Eshetu Beshada, Ph.D., P.Eng.

Dear Mr. Beshada:

Re: Urbanmine Inc. - Manitoba Conservation & Water Stewardship File 5684.00
72 Rothwell Road, Winnipeg
Response to Review Comments

Further to Urbanmine Inc.'s ongoing application for an *Environment Act* licence, please find enclosed an Acoustic Assessment Report prepared by Dillon Consulting which I am instructed to file in support of Urbanmine's application.

From prior correspondence and discussions with your department, it is my understanding that Manitoba Conservation & Water Stewardship expects a further public consultation session to take place, but that this session should be scheduled only once comments on the report have been received. Provided your department is in a position to receive comments by the end of April 2015, Urbanmine Inc. would endeavour to schedule a consultation meeting for May 2015. Please contact me to canvass potential dates, as it is my understanding that one or more representatives of Manitoba Conservation & Water Stewardship would like to take part in the meeting.

Yours truly,

FILLMORE RILEY LLP

Per:

SVEN T. HOMBACH *

Encls.
*Services provided by S.T. Hombach Law Corporation

DILLON CONSULTING

Acoustic Assessment Report

Urbanmine Inc., Winnipeg, Manitoba
Privileged and Confidential

Prepared for: Fillmore Riley LLP

March 2015 Final Report– 15-1470

March 20, 2015

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Attention: Mr. Sven T. Hombach

Re: Urbanmine Inc. – Acoustic Assessment Report
Manitoba Conservation and Water Stewardship (File: 5684.00)

Dear Mr. Hombach:

Dillon Consulting Limited has completed an Acoustic Assessment Report for the Urbanmine Inc. facility located at 72 Rothwell Road, Winnipeg, Manitoba. This report documents the noise prediction modelling efforts used to identify and optimize noise mitigation measures at the facility that result in an improved noise environment at the nearby residential area. With the implementation of the noise mitigation measures identified in this report, the facility will comply with the maximum desirable daytime noise guideline level of 55 dBA.

Please contact the undersigned if follow-up is required.

Sincerely,

Dillon Consulting Limited

Dennis Heinrichs, M.Sc., P.Eng.
Partner

DMH/knp

Our File: 15-1470

Table of Contents

Acronyms and Abbreviations

– A –

AAR	Acoustic Assessment Report

– D –

dBA	A weighted scale of decibels adjusted to reflect the response of normal human ear to different frequencies of sound
dB	Decibel

– I –

ISO	International Organization for Standardization

– M –

MCWS	Manitoba Conservation and Water Stewardship
MOECC	Ministry of the Environment and Climate Change - Ontario

– P –

POR	Point of Reception

1.0 INTRODUCTION

Urbanmine Inc. (Urbanmine) has been operating a ferrous and non-ferrous metal processing facility (the Facility) in Winnipeg, Manitoba since 2009. The Facility is located within a M3-zoned (Industrial, Heavy) area and immediately adjacent to rail and hydro right-of-ways (on the east side) owned by Canadian Pacific Railway Limited (CP Rail), Canadian National Railway (CN Rail), and Manitoba Hydro (Hydro). There are large industrial / commercial establishments to the north, south and west of the Facility. The Facility is approximately 300 m from Kenaston Boulevard. The closest residential area to the Facility is the Linden Woods Community, located east of the right-of-way corridor.

The Facility essentially operates a transfer depot, where recyclable materials are brought to the site, sorted, sheared / cut, re-organized / packaged and shipped to the end processors.

1.1 Purpose and Objectives

Currently, Urbanmine is undergoing its initial application for a Class 1 Environment Act Licence under the Environment Act. A proposal was submitted to Manitoba Conservation and Water Stewardship (MCWS) in April 2014 and was assigned file number 5684.00. In October 2014, Dillon Consulting Limited (Dillon) was commissioned by Tapper Cuddy LLP to execute an environmental monitoring program for ambient air quality, noise, and vibration. The purpose of this program was to determine any potential impacts and whether further studies are required. The findings of the environmental monitoring program were filed with MCWS in December 2014.

As a follow-up to the background noise monitoring program, (Dillon) was retained by Fillmore Riley LLP to undertake detailed noise prediction modelling for Urbanmine's scrap metal processing facility. The purpose of the noise prediction modelling is to identify and optimize noise mitigation measures at the Facility that result in an improved noise environment at the nearby residential area.

1.2 Summary of Acoustic Environment Applicable Noise Limits

The background ambient noise, exclusive of that generated by the Facility, can be characterized as having qualities of an urban centre. The primary contributors to the background sound during the daytime and nighttime periods are transportation (both road and rail) as well as noise from industrial and commercial activities in the area.

Based on the background noise monitoring program conducted in April of 2014, the average hourly sound level equivalent at the nearest residential receptors within the Linden Woods Community is in the low 50's dBA. This value is similar during daytime and nighttime hours.

1.3 Statement of Compliance to Applicable Noise Limits

With the implementation of the noise mitigation measures identified in this report, the Facility will comply with the maximum desirable daytime noise guideline level of 55 dBA, as stipulated in the MCWS's (formerly Province of Manitoba, Environment) Guidelines for Sound Pollution for residential areas, issued September 21, 1992, for all sources assessed in this report. The guidelines are included in Appendix A.

2.0 FACILITY DESCRIPTION AND NOISE SOURCES

The Facility operates a transfer depot, where recyclable materials are brought to the site, sorted, sheared / cut, re-organized / packaged and shipped to the end processors.

A site plan on Figure 1 provides an overview of the Facility, on-site structures, and the surrounding area. Below is a list of equipment and activities / operations that generate significant noise levels at the Facility. The noise levels for the sources listed below were measured during an on-site noise source measurement program (see Section 3, below). For the purposes of this assessment, the following noise sources have been included in the predictive modelling.

2.1.1 Sierra Electric Shear

The operational cycle for the Sierra electric shear includes: (1) loading the shear's hopper with scrap metal using a mobile crane with grapple / magnet (Liebherr 934 mobile crane on steel tracks), (2) tipping the hopper into the shear bed, (3) folding of the arms and movement of the arms to reposition material as necessary, and (4) ramming and cutting. The Sierra shear processes two types of materials, referred to as #1 loose and #2 loose. The #1 loose material tends to be of heavier gauge and generates more noise during this process (confirmed during on-site noise measurement). For modelling purposes, to account for the worst-case noise emission scenario with highest measured noise, data collected while the equipment was processing #1 loose material was used.

2.1.2 Liebherr 934 Mobile Crane (Steel Tracks)

This mobile crane on steel tracks is primarily involved with loading the Sierra shear hopper and material handling next to the shear. Noise from its engine and hydraulics systems is captured within the noise measurement data for the Sierra Shear process.

2.1.3 Liebherr 934 Mobile Crane (Rubber Tires)

A second mobile crane equipped with grapple (Liebherr 934) on rubber tires is primarily involved with material movement on the northwest side of the site. It loads scrap onto incoming empty B Train trailers.

2.1.4 Mint Coil Processing

This activity takes place mainly inside the Facility's warehouse building. Coiled metal punchings are processed indoors. A briquetter / baler then shapes the resulting material into rectangular bricks. The bricks are then transferred to the exterior of the building using a stacker conveyor. The stacker exits the building through the bottom section of a bay door. The current material originates from the mint.

2.1.5 Pacific and Canton Shear Line

The Pacific shear processes metals indoors. Material is then transferred to the exterior of the warehouse building (via two connecting shaker tables through a bay door) for further processing by the Canton shear.

2.1.6 Liebherr 924 Mobile Crane (Rubber Tires)

This mobile crane is equipped with a grapple or a magnet and is mainly used for material handling on the northeast section of the site. For noise modelling purposes, to account for the worst-case noise emission scenario, the highest measured noise level collected while the equipment was handling rail cuts was used. It should be noted that the Facility rarely processes rail cuts, and as such, the inclusion of this source in the modelling is considered to be conservative.

2.1.7 Granulator

The granulator, located inside the warehouse building, processes insulated wire and separates metal from insulation. Noise measurements were conducted at various locations along the length of the granulator and the highest measured noise level was used in the modelling.

2.1.8 Cyclone

A cyclone dust collector operates as part of the granulator. The exhaust from the granulator is directed to the dust collector through ducts. The dust collector is located outside of the warehouse building. The air intake for the granulator's dust collection system is also located outside of the building, just above the roofline. The noise data for this source was collected when it was operating at maximum capacity.

2.1.9 Michigan L90 Loader

A multi-purpose loader operates at the Facility. The loader is mainly used for material handling and snow clearing. The noise data for this source was collected while the engine was at high rev.

2.1.10 EZ Crusher

The EZ crusher is a mobile unit that is used to bale metal. The unit is equipped with a light-duty crane, which is used for loading materials into the baler chamber and extracting baled material from the chamber. The baler is also equipped with a hydraulic system that compacts the loose materials into bales.

2.1.11 Excel Baler

The excel baler is used to bale mixed loose scrap collected in bins. The baler system consists of conveyer belts, a hydraulic system, and hoppers. An electric forklift is used to load materials from the bins onto the feed hopper. Noise measurements were conducted at various spots along the length of the baler and the highest measured noise level was used in the modelling.

2.1.12 Air Compressor

Located inside the warehouse, the air compressor provides compressed air for instrumentation and pneumatic equipment at the Facility. The compressor is only activated when air pressure decreases below a set threshold.

2.1.13 Ring Mill

To improve processing efficiency and move some of the metal preparation indoors, the Facility will be installing a ring mill which will be processing materials similar to those currently being processed by the outdoor Sierra shear. The ring mill will be installed in an acoustic enclosure / building and will be processing materials that would typically be processed by the outdoor Sierra shear. Since this equipment was not installed at the time of conducting this study, manufacturer-specified noise data was used for the noise modelling. The ring mill will be located in a concrete block building and the openings to the building will be situated to face west, away from the nearest points of reception (PORs).

During the site visit it was determined that the following on-site noise sources had negligible contribution to the overall noise impact from the Facility:

- Three (3) desktop sized indoor table shears;
- Four (4) electric / propane forklifts operating mainly inside the warehouse building;
- One (1) 780E Gehl skidsteer;
- One (1) small Hustler conveyor operating inside the warehouse building for small aluminium pieces; and,
- Five (5) building exhaust vents along the east facade of the warehouse building.

As such, these sources were not included in the noise modelling.

The Facility occasionally operates a car flattener at the site. Noise from this equipment is also expected to be negligible in comparison to dominant noise sources mentioned above. It is our understanding that the car flattener does not operate in conjunction with some of the dominant noise sources listed above (e.g., rail cut loading, B-Train loading, etc.). As such, for the purposes of this assessment, it is not included in the modelling of the worst-case scenario.

2.2 Operating Hours of Facility

The Facility typically operates weekdays from 7:00 am to 5:00 pm; however, on occasions, due to unusual circumstances or operational conditions, the Facility may need to operate for extended hours (i.e., 6:00 am – 9:00 pm) Monday through Saturday.

For the purposes of this assessment, all dominant noise sources (discussed above) were conservatively assumed to operate simultaneously and continuously for the worst-case one-hour noise impact scenario.

FIGURE 1: SITE PLAN

3.0 NOISE SOURCE MEASUREMENT PROGRAM

An on-site source-specific noise measurement program was undertaken by Dillon on February 18 and 19, 2015. Noise measurements were conducted in accordance with the Ontario Ministry of the Environment and Climate Change (MOECC) noise publication NPC-103.

3.1 Instrumentation

A Norsonic 140 Type I sound level analyzer (Serial No. 1403048) was utilized for the measurements. The Norsonic 140 was calibrated during both measurement days, before and after measurements; using a Norsonic AS Sound Calibrator Type 1251 (Serial No. 31746 - calibrated Mar 19, 2014). Calibration certificate for the instruments are presented in Appendix B.

3.2 Noise Source Measurement

For each noise source, at least triplicate measurements were logged and their arithmetic averages were used for calculating the sound power level. Worst-case noise emission scenarios were simulated during all measurements. To facilitate accurate measurements, noise sources were turned on and off, and operated under different loads. This allowed for each source to be isolated.

In cases with noticeable variability in noise was observed, measurement was paused or the measurement durations were changed to capture the peak noise. For multi-step operations, maximum measured noise level was converted to sound power level and used for noise prediction modelling. For sources inside the warehouse building, conservatively, no correction for reverberation was applied to the measured noise levels.

The raw data from on-site measurements and sound power level calculations are presented in Appendix C.

4.0 NOISE SOURCE SUMMARY

4.1 Noise Source Summary Table

The dominant on-site noise sources included in the modelling are listed in Table 1 below. This table contains a listing of noise source sound power levels, source location, and sound characteristics. The general locations of the noise sources listed below are presented on Figure 2. The source IDs presented on Figure 2 match those listed in Table 1.

TABLE 1: NOISE SOURCE SUMMARY TABLE

Source Description	Source ID	Sound Power Level (dBA)	Source Location[1]	Sound Characteristics[2]
Sierra Shear - Processing No 1 loose	SS1	121.6	O	I
LB934 - Material Handling	LB934_MH	114.4	O	S
B Train loading - No 1 material (LB 934)	BTL	105.3	O	S
Mint Coil Processing - outside of the building.	BTQ	94.5	O	I
Pacific and Canton Shear - outside building.	PCS	119.5	O	S
Material Handling - Rail cuts (LB 924)	MHRC	120	O	S
Cyclone (overall)	CYCL	101	O	S
Michigan L90 loader	ML90	102.1	O	S
EZ Crusher	EZC	103.5	O	S
Granulator	GRN	92.5	I	S
Pacific Shear and Shaker tables - inside building.	PSST	98.2	I	S
Mint Coil Processing - indoor	MCP	91.6	I	S
Excel Baler - indoor	EB	85.9	I	S
Air Compressor - indoor	AC	68.4	I	S
Ring Mill	RM	108.8	I	S

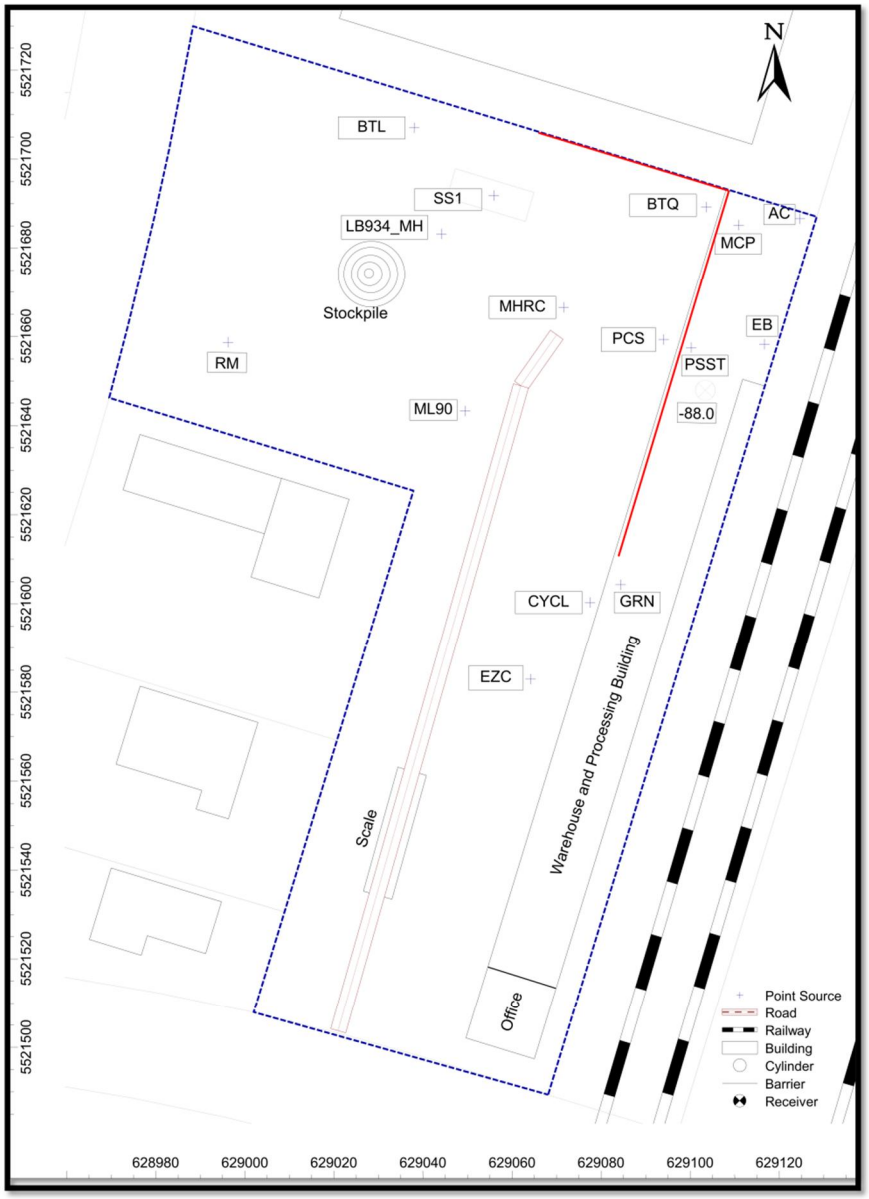
Noise Source Summary Table Notes:

1. Source Locations	2. Sound Characteristics
O – located/installed outside the building, including on the roof	S – Steady
I – located/installed inside the building	Q – Quasi Steady Impulsive
	I – Impulsive
	B – Buzzing
	T – Tonal
	C – Cyclic
	Int – Intermittent

The sound power levels presented in Table 1 include adjustments for building enclosure (i.e., 20 dB reduction) as well as impulsive noise penalty (i.e., 10 dB addition).

In addition to point sources listed in Table 1, a line source, representing the on-site truck route was also included in this assessment. The line source was defined in the model to represent travel of five trucks per hour, travelling at an average speed of 10 km/h. The location of the truck route is illustrated on Figure 2.

FIGURE 2: NOISE SOURCE LAYOUT – URBANMINE FACILITY



5.0 POINTS OF RECEPTION

5.1 Land Use Zoning Plan

The Urbanmine Facility is located on land that is zoned Industrial, Heavy. The lands surrounding the Facility are zoned identically. The nearest residential zoned lands are approximately 80 m east of the Facility, east of the rail / hydro right-of-ways. The zoning plan for the area is provided in Appendix D.

5.2 Scaled Area Location Plan

Figure 1 shows is an aerial photograph of the Facility and the surrounding area including the nearest points of reception (i.e., receptors).

5.3 Points of Reception (PORs)

The City of Winnipeg's Neighbourhood Liveability By-Law (Part 5, Section 65) defines a Point of Reception (POR) / receptor as "Any point on any property where sound, originating from other property, is heard by a person who is engaged in normal activities." The MCWS's (formerly Province of Manitoba, Environment) Guidelines for Sound Pollution for residential areas, defines residential areas as, "*Areas where human beings live, including apartments, hospitals, schools, seasonal residences, and mobile homes, as well as year round residences, since these are places where people sleep and often spend extended periods of time."*

A total of six (6) noise sensitive points of reception were identified as the basis for this acoustic assessment, as shown on Figure 3. All identified receptors are year-round permanent residences. A description of each receptor is provided in Table 2.

TABLE 2: NOISE SENSITIVE RECEPTORS

POR ID	Location	Comments
POR1	approximately 200m northeast of the Facility	2-storey Residential dwelling
POR2	approximately 120m northeast of the Facility	2-storey Residential dwelling
POR3	approximately 100m northeast of the Facility	2-storey Residential dwelling
POR4	approximately 90m east of the Facility	2-storey Residential dwelling
POR5	approximately 100m southeast of the Facility	2-storey Residential dwelling
POR6	approximately 150m southeast of the Facility	2-storey Residential dwelling

6.0 POINT OF RECEPTION NOISE IMPACT ANALYSIS

A predictive noise modelling exercise was undertaken to determine the potential noise impact that the Urbanmine facility can have on the nearby receptors. The modelling was set to simulate worst-case noise emission scenario from the Facility, assuming all sources are operating at their maximum capacity (i.e., highest noise emission) and simultaneously.

An initial noise modelling, using measured source-specific noise data and a worst-case noise emission scenario was completed, assuming status quo operations and noise mitigation measures. The current noise mitigation measures implemented at the Facility are mainly operational and include (but not limited to): having doors to the warehouse building (east facade) closed when operating, placing materials handled by grapple / magnet rather than throwing them, and keeping the height of the stockpiles lower than the height of warehouse building.

The initial modelling results were calibrated against ambient noise monitoring data gathered by Dillon in October 2014 to ensure accurate representation of the Facility's noise emissions.

6.1 Procedure for Assessing Noise Impacts at Each POR

The worst-case noise emission scenario at each receptor was modelled using the CADNA/A software program from DataKustik GmbH. The outdoor noise propagation model is based on ISO 9613, Part 1: Calculation of the absorption of sound by the atmosphere, 1993 and Part 2: General method of calculation (ISO-9613-2: 1996). The model is capable of incorporating various site-specific features such as elevation, berms, ground absorption and barriers to accurately predict noise levels at specific receptors, pertaining to noise emissions from a particular source(s). The ISO based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures and topography. The model is considered conservative since it represents atmospheric conditions that promote propagation of sound from source to receiver.

A georeferenced digital site plan was used as the basis for model construction. Data from the noise source measurements and site specific parameters, including site layout and building profiles were incorporated in the model.

6.2 Modelling Parameter/Assumptions

Source specific noise data was input into the CADNA/A software to model the noise impact at the selected nearest receptors. All significant noise sources were modelled as point sources with hemispherical spreading. The following assumptions were used in the calculations:

Receptors

A receptor height of 4.5 m above ground representing the second storey of a two-storey residential dwelling was used for all sensitive receptors assessed. It was also noted that some dwellings are situated on top of a berm that is elevated between 1.0 and 1.5 m. As such, receptor heights in the model were adjusted to reflect the higher elevation (i.e., depending on their locations, receptor heights were set to 5.5 m and 6 m in the model).

Reflections

Site specific sound-level measurements included the effects of nearby reflective surfaces (i.e., not a free-field measurement); however, conservatively, sources were modelled assuming a third-order reflection.

Ground Absorption

For the noise modelling, a ground absorption coefficient of 0.5 was used to represent a mix of soft and hard surfaces between the Facility and the receptor locations.

Noise Data

Measured sound pressure levels were converted to sound power levels for use in the model. As a ring mill is not currently operating on-site, manufacturer-provided noise data from American Pulverizer Company was used for this source. For some sources (e.g., on-site truck traffic) noise data from Dillon's in-house database or CADNA model's database was used. A 10 dB penalty was applied to sources with impulsive characteristics.

Duty Cycle

With the exception of material handling of rail cuts, all other sources were assumed to occur continuously and simultaneously for the duration of one (1) hour at worst-case scenario. For rail cuts loading, the operation was considered to occur for 30 minutes in any given hour.

Topography

The area surrounding the Facility and receptors is primarily flat ground. The Facility and the surrounding areas were modelled as such (i.e., topography was not incorporated in the modelling).

Barriers and Structures

The modelling was set not to account for shielding for sources within buildings. However, a 20 dB deduction was assigned for sources within the warehouse building. The warehouse building is constructed of 7.5" thick concrete block walls. Sources within the warehouse building are not audible outside of the building envelope with the exception of two (2) bay doors used for the Canton shear and the mint coil processing conveyor. Both of these sources have been modelled as outside noise sources (i.e., no deduction).

Furthermore, based on discussions with the Facility, the Ring Mill was considered to be within an enclosure that would provide a minimum of 20 dB noise attenuation. The enclosure will either consist of concrete blocks (7.5" thick), similar to the warehouse building, or a combination of corrugated steel (minimum of 18 gauge steel for building exterior) with soft insulation (minimum of 4") and perforated sheeting (minimum of 22 gauge steel for building interior). The building openings will be on the west side of the building, facing away from the receptors on the east side of the Facility.

Sound Quality

All dominant noise sources were considered to emit noise on a continuous, steady-state manner. An impulsive penalty of 10 dB was applied to the sources with impulsive characteristics, as per MOECC's noise publication NPC-104.

6.3 Modelling Results

The predicted receptor sound levels are presented in Table 3. The applicable guideline limit, based on the MCWS's (formerly Province of Manitoba, Environment) Guidelines for Sound Pollution for residential areas is 55 dBA for daytime (7am – 9pm).

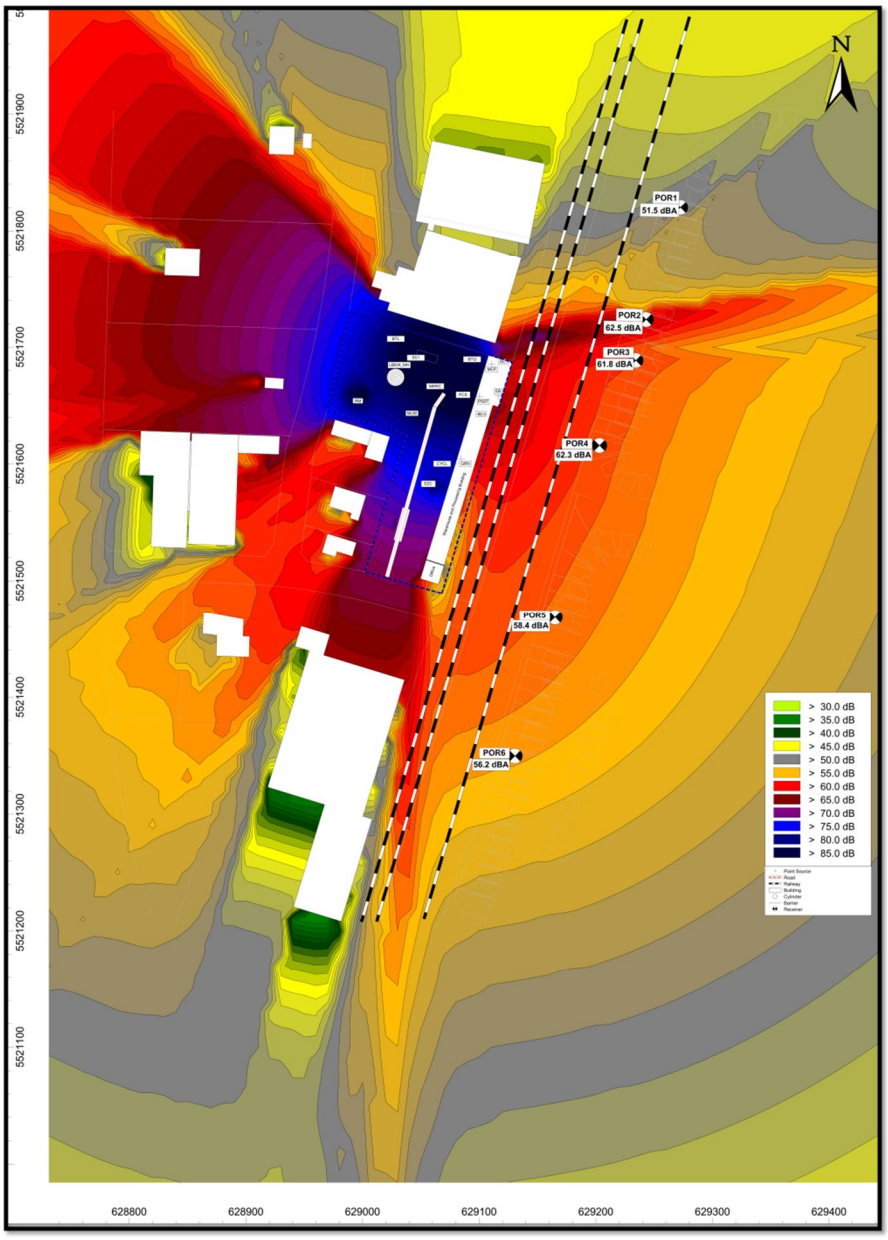
TABLE 3: PREDICTED RECEPTOR NOISE LEVELS – WITHOUT NOISE MITIGATION

Point of Reception ID	Point of Reception Description	Time of Day	Sound Level at Point of Reception (dBA) (L_{eq})	Performance Limit (dBA) (L_{eq})	Compliance with Performance Limit (Yes/No)
POR1	2-Storey Residential Dwelling	Daytime	51.5	55	Yes
POR2	2-Storey Residential Dwelling	Daytime	62.5	55	No
POR3	2-Storey Residential Dwelling	Daytime	61.8	55	No
POR4	2-Storey Residential Dwelling	Daytime	62.3	55	No
POR5	2-Storey Residential Dwelling	Daytime	58.4	55	No
POR6	2-Storey Residential Dwelling	Daytime	56.2	55	No

The noise level contours (at 4.5 m above-ground, in dBA) are presented graphically on Figure 3. This graphical output generated by CADNA indicates sound levels extending from the site during the worst-case daytime operating scenarios. Also presented in the figure are the predicted receptor sound levels in dBA.

The modelling results indicate that for the Facility to be in compliance when operating under worst-case noise emission scenario, noise mitigation is required. Noise mitigation measures are discussed in the subsequent sections of this report.

FIGURE 3: NOISE LEVEL CONTOURS – URBANMINE FACILITY – WITHOUT NOISE MITIGATION



7.0 NOISE MITIGATION MEASURES

7.1 Proposed Mitigation Measures

Series of effective and feasible noise mitigation measures were developed in collaboration with the Urbanmine team in order to achieve compliance at all the nearby receptors. The Facility is considered compliant with the desirable daytime noise criterion of 55 dBA if the predicted receptor noise levels at all nearby receptors are at or less than the criterion.

In order to achieve compliance, the following optimized noise mitigation measures will be implemented, provided that all required permits and approvals for such measures can be obtained, and that measures are structurally feasible:

a) Noise Barrier Wall - A 9 m high wall will be installed along the northern property boundary of the Facility. The wall will be connected to the warehouse building (without a gap) on the east side and will extend a minimum of 45 m westwards.

b) Roof Addition - A 6 m high (at the peak) rooftop structure that will be built on the existing facility building, extending approximately 108 m from the northern facade of the building, southwards. The vertical extension will be such that the peak point will be as close to the west side of the building as possible.

The above-mentioned mitigation measures are implemented in addition to the existing operational mitigations that are currently implemented at the Facility (i.e., placing materials rather than throwing them, keeping the warehouse doors on the east facade closed when operating).

7.2 Point of Reception Noise Impact Table

The predicted sound levels at the points of reception account for attenuation by divergence (distance), applicable barrier/screening effects, ground effects, foliage, and air absorption. Table 4 summarizes the overall modelled day/night sound levels (which include the above-mentioned attenuations) for each of the dominant noise sources at the Facility (i.e., partial levels).

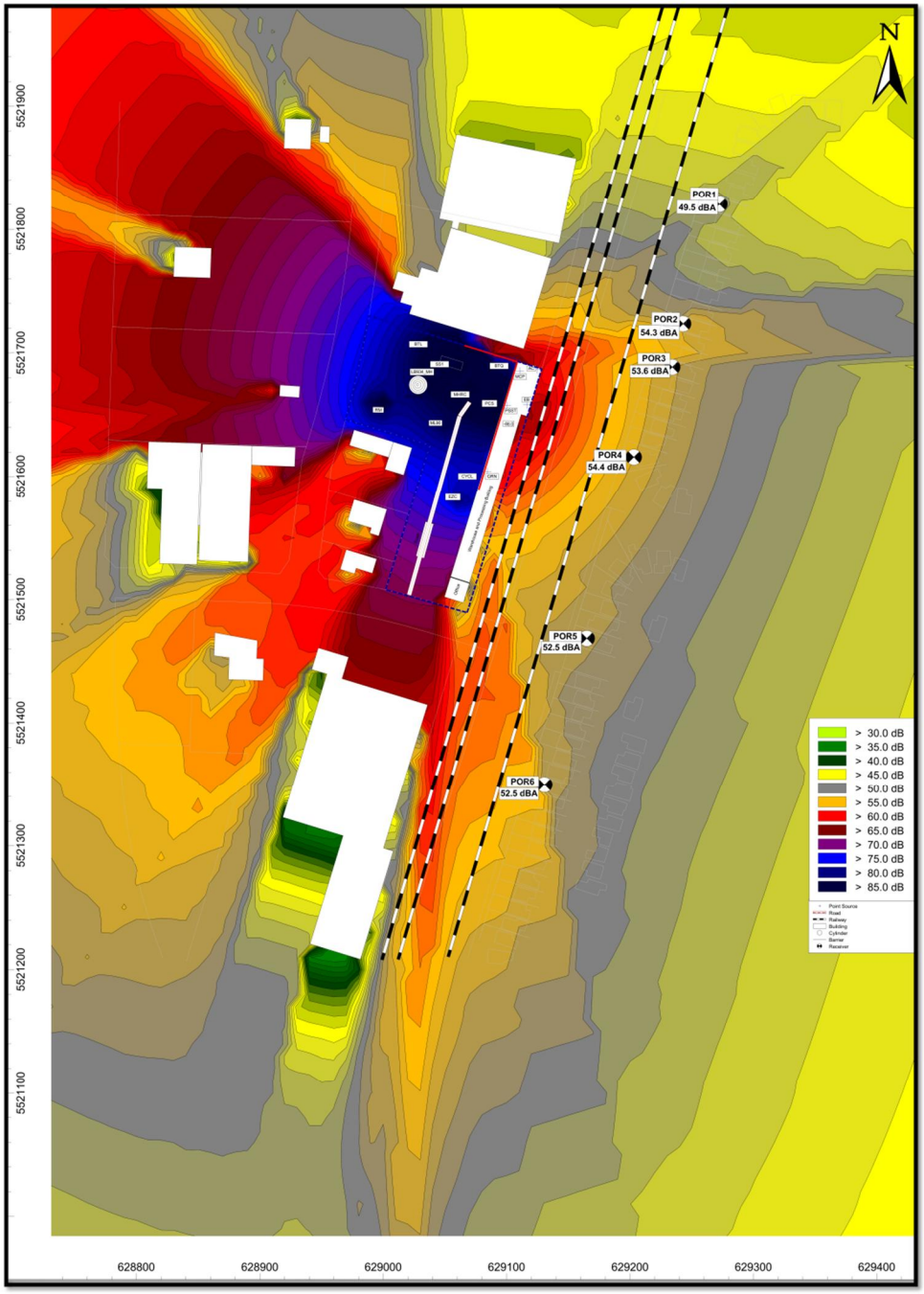
TABLE 4: POINT OF RECEPTION NOISE IMPACT TABLE (PARTIAL LEVELS)

Source Name	Source ID	Partial Level (dBA)					
		POR1	POR2	POR3	POR4	POR5	POR6
Sierra Shear - Processing No 1 loose	SS1	43	52.1	50.5	50.8	49.5	49.9
LB934 - Material Handling	LB934_MH	37	45.3	41.4	41.7	40.7	45.1
B Train loading - No 1 material (LB 934)	BTL	28.1	33.4	41.1	34.9	33.9	36.7
Briquetter outside of the building	BTQ	17.9	20.6	21.6	22	16.6	13.9

Source Name	Source ID	Partial Level (dBA)					
		POR1	POR2	POR3	POR4	POR5	POR6
Pacific and Canton Shear - outside building	PCS	37.7	42.2	43.6	45.8	39.7	35.3
Material Handling - Rail cuts (LB 924)	MHRC	45.8	42.7	43.3	44.3	42	41.8
Cyclone (overall)	CYCL	17.7	21	22.3	25.9	23.8	19.4
Michigan L90 loader	ML90	29.3	29.7	30	30.8	29.6	35.2
EZ Crusher	EZC	25.6	26.9	27.8	35.8	32.4	30.2
Granulator	GRN	31.5	35.1	36.5	40.1	37.4	32.5
Pacific Shear and Shaker tables - inside building	PSST	38	42.2	43.6	45.8	39.7	35.5
Mint Coil Processing - indoor	MCP	32.7	37	38.1	38.8	32.2	28.3
Excel Bailer - indoor	EB	26.9	31.5	33.1	35.3	28.3	23.9
Air Compressor - indoor	AC	11.5	15.9	17.1	17.5	10.4	6.6
Ring Mill	RM	38.4	39.3	39.5	39.7	44.3	41.2
On-site Truck Route	TRK_Rt	17.1	19.1	19.6	21.2	23.9	25.9

The graphic output from the model, illustrating sound level contours and predicted receptor noise levels (including the above-mentioned mitigation measures), is presented on Figure 4. The barrier wall along the northern property boundary and the rooftop extension are presented with red lines. The modelling calculations (i.e., CADNA Output) are provided in Appendix E.

FIGURE 4: NOISE LEVEL CONTOURS – URBANMINE FACILITY – WITH NOISE MITIGATION



7.3 Routine Equipment Maintenance Improvements

During on-site noise measurements, several simple-to-fix improvements to the equipment that can reduce noise impact were identified. The improvements include:

- Pacific and Canton Shear Line:
  - Installing an enclosure to contain the Canton shear and the shaker table conveyor;
  - Adjust the two (2) shaker table conveyors such that there is no contract between the hoppers' edge and the shaker tables; and,
  - Line the bed of the two (2) shaker tables with rubber to soften the drop of sheet cuts on to the shaker tables.
- Mint Coil Processing:
  - Install rubber linings at the bottom of the tipping hopper bucket to reduce the noise from bucket landing on the floor stands.

Continuous maintenance of the equipment such as, lubrication of moving parts, periodic inspection and/or replacement of bearings, eliminating / fastening loose parts / components of power equipment can generally help reduce noise generation at the Facility. For the purposes of this assessment, the noise data for these sources were without the implementation of the above-mentioned improvements.

8.0 Acoustic Assessment Summary

8.1 Acoustic Assessment Summary Table

Table 5 illustrates the compliance of Urbanmine's Facility with the applicable daytime noise guideline of 55 dBA at all the selected nearest receptors. The predicted level in this table reflects the implementation of the above-mentioned physical and operational noise mitigation measures.

TABLE 5: ACOUSTIC ASSESSMENT SUMMARY TABLE

Point of Reception ID	Point of Reception Description	Time of Day	Sound Level at Point of Reception (dBA) (L_{eq})	Performance Limit (dBA) (L_{eq})	Compliance with Performance Limit (Yes/No)
POR1	2-Storey Residential Dwelling	Daytime	49.5	55	Yes
POR2	2-Storey Residential Dwelling	Daytime	54.3	55	Yes
POR3	2-Storey Residential Dwelling	Daytime	53.6	55	Yes
POR4	2-Storey Residential Dwelling	Daytime	54.4	55	Yes
POR5	2-Storey Residential Dwelling	Daytime	52.5	55	Yes
POR6	2-Storey Residential Dwelling	Daytime	52.5	55	Yes

9.0 CONCLUSION

Urbanmine Inc. (Urbanmine) has been operating a ferrous and non-ferrous metal processing facility (the Facility) in Winnipeg, Manitoba since 2009. The Facility essentially operates a transfer depot, where recyclable materials are brought to the site, sorted, sheared / cut, re-organized / packaged and shipped to the end processors.

Dillon was retained by Fillmore Riley LLP to undertake detailed noise prediction modelling for Urbanmine's scrap metal processing facility. The purpose of the noise prediction modelling is to identify and optimize noise mitigation measures at the Facility that result in an improved noise environment at the nearby residential area.

With the implementation of the noise mitigation measures identified in this report, the Facility will comply with the maximum desirable daytime noise guideline level of 55 dBA, as stipulated in the MCWS's (formerly Province of Manitoba, Environment) Guidelines for Sound Pollution for residential areas, issued September 21, 1992, for all sources assessed in this report.

10.0 CLOSURE

This Acoustic Assessment Report has been prepared based on information provided by Urbanmine. This report is intended to provide a reasonable review of available information within an agreed work scope, schedule and budget. This report was prepared by Dillon for the sole benefit of Fillmore Riley LLP and Urbanmine Inc. The material in the report reflects Dillon's judgment in light of the information available to Dillon at the time of this report preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Please do not hesitate to contact the undersigned if you have any further questions on this report.

Respectfully Submitted:

DILLON CONSULTING LIMITED

Amir A. Iravani, Ph.D., P.Eng.
Associate

Dennis M. Heinrichs. M.Sc., P.Eng.
Project Manager

APEGM
Certificate of Authorization
Dillon Consulting Limited (MB)
No. 1789 Date: Mar20/15

PROVINCE OF MANITOBA
D. M. HEINRICHS
Mar20/15
REGISTERED PROFESSIONAL ENGINEER

11.0 REFERENCES

City of Winnipeg, Neighbourhood Liveability By-Law, November 2008.

Ontario Ministry of Environment, Publication NPC-300 Environmental Noise Guidelines – Stationary and Transportation Sources – Approval and Planning, August 2013.

Ontario Ministry of the Environment, Model Municipal Noise Control By-Law Publication NPC-103, August 1978.

Ontario Ministry of the Environment, Model Municipal Noise Control By-Law Publication NPC-104, August 1978

Province of Manitoba, Environment, Guideline for Sound Pollution, September 1992.

Appendix A

Manitoba Conservation and Water Stewardship Guidelines for Sound Pollution

DILLON CONSULTING

PROVINCE OF MANITOBA ENVIRONMENT
Box 7, Bldg. 2, 139 Tuxedo Ave.
Winnipeg, Manitoba R3N 0H6

GUIDELINES FOR SOUND POLLUTION

PREPARED BY

ENVIRONMENTAL MANAGEMENT DIVISION

PURPOSE:

The purpose of these objectives is to provide information, in the form of Environmental Sound Level Objectives, for the evaluation or assessment of sound (noise) in the outdoor environment. These objectives, as well as providing a planning tool for industry, consultants and planners, also provide a framework for noise pollution control activities under the Clean Environment Act. It is important to note, however, that the following are objectives and not strict standards, and as such recommendations made to the Clean Environment Commission for site assessments may vary from time to time as consideration is given to such factors as existing background levels, technological practicability, social attitudes and economics, in order to eventually reach the limits set out in the objectives.

CRITERIA:

The sound level objectives of this guideline are based on the following criteria.

Maximum Desirable Level (Residential and Commercial Areas) - This level defines the long term goal and represents the existing noise level in many quiet urban and suburban areas. This level has been identified by the United States Environmental Protection Agency as requisite to protect the public health and welfare with an adequate margin of safety. At this level, less than 1% of households would be expected to complain, although 17% of the people may respond as highly annoyed when questioned in a social survey. No reaction would be expected in the average community, and noise would be the least important factor in attitude towards neighborhood.

Maximum Acceptable Level (Residential Areas) - This level is intended to provide adequate protection against effects on personal comfort and well being. At this level, less than 2% of households would be expected to complain, although up to 23% of the people may respond as highly annoyed when questioned. Some community reaction (sporadic complaints) would be expected in the average community, and noise would be a minor factor in attitude towards neighborhood. This level is at least 10 decibels below the level requisite to protect against noise induced hearing loss. This level provides an adequate acoustical environment for speech communication, indoors and outside.

. . . /2

Maximum Acceptable Level (Commercial and Industrial Areas) - This level is intended to provide adequate protection against noise-induced hearing loss. The level identified is designed to protect virtually the entire population (greater than 96%) from suffering detectable hearing loss (5 dB at 4,000 Hz).

Where sound levels exceed these "maximum acceptable levels," the sound level is considered to be excessive, and follow-up action under the Clean Environment Act may be warranted, depending on a variety of factors.

Maximum Tolerable Levels (All Areas) - Prolonged exposure to sound levels of this magnitude are believed to pose a serious threat to health and welfare, requiring immediate abatement action to stop or reduce sound emissions to acceptable levels. Where it is in the public interest to continue such operations and practical means of reducing sound emissions are not available, persons likely to be affected by the sound may be removed from the area. Exposure to sound levels of this magnitude may be permitted for short periods.

DEFINITIONS

The following definitions were prepared for the interpretation/application of this guideline. For more precise scientific definition reference should be made to Canadian Standards Association Z107.1 1973 - Specification for Sound Level Meters, or American National Standard S1.1 - 1960 (R1971) - Acoustical Terminology.

1. A-weighted sound level is the sound level measured with a sound level meter set on the A-weighting network, a filter designed to approximate the relative sensitivity of the normal human ear to different frequencies of sound. The unit of measurement is denoted dBA.

2. Appreciable impulsive/impact character - sounds which by subjective evaluation have a significant amount of impulsive or impact character, such as repeated hammering, explosions, clanking or banging. Impulsive or impact sounds are sounds of short duration, usually less than one second, with an abrupt onset and rapid decay.

3. Commercial areas for the purpose of this guideline, include hotels, motels, retail and financial service facilities, offices and miscellaneous commercial services. They do not include warehouses, manufacturing plants or other industrial facilities.

. . ./3

4. Daytime - the period between 7:00 a.m. and 10:00 p.m.

5. Decibel (dB) - is a dimensionless measure of sound level or sound pressure level. Sound Level = $20 \log_{10} \frac{\text{pressure (actual)}}{\text{Pressure (reference)}}$

6. Hearing Loss - for the purpose of the guideline, hearing loss means a change in hearing threshold of 5 decibels at 4,000 Hertz. This criterion is based on statistical study of large populations, and may not relate to specific individuals.

7. Industrial areas, for the purpose of this guideline, include such facilities as manufacturing plants, warehouses, storage areas, distribution facilities and mining operations. Agricultural operations exclusive of residences would be included in this category.

8. $L_{equivalent}$ (L_{eq}) - the equivalent, A-weighted sound level is the intensity (dBA) of the constant or steady sound level that would result in exposure to the same total A-weighted energy as would the specified time varying sound, if the constant sound level persisted over an equal time interval. Note $L_{eq}(1)$ is the equivalent sound level for a 1 hour period, and similarly, the $L_{eq}(24)$ represents the equivalent sound level for a 24 hour period.

   For example, the permitted durations of sound at various intensities resulting in a 1 hour L_{eq} of 60 dBA (neglecting the sound level the "off" or "quiet" period) are as follows:

DURATION (Minutes per Hour)	SOUND LEVEL (dBA)
60	60
30	63
15	66
7.5	69
3.8	72
1.9	75

   Thus a sound level of 66 dBA persisting for 15 minutes during a one hour period would be equivalent to a level of 60 dBA for the full hour.

9. $L_{day-night}$ or L_{dn} is the day-night average sound level; the 24 hour A-weight equivalent sound level, with a 10 decibel penalty added to night-time (10:00 p.m. to 7:00 a.m.) levels.

10. Night-time - the period between 10:00 p.m. of one day and 7:00 a.m. the following day.

11. Noise - unwanted or undesirable sound; sounds which create detrimental effects.

12. One-third octave band sound level - the sound level for the sound being measured contained within the specified 1/3 octave band.

13. Point of reception - is any point on the premises of a person where sound originating from other than those premises is received.

14. Predominant discrete tone - sound having a one-third octave band sound level which, when measured in a one-third octave band, exceeds the arithmetic average of the sound levels of the two adjacent one-third octave bands on either side of such one-third octave band by:

    (a) 5 dB for such one-third octave band with a center frequency from 500 Hertz to 20,000 Hertz, inclusive, provided such one-third octave band sound level exceeds the sound level of each adjacent one-third octave band, or;

    (b) 8 dB for such one-third octave band with a center frequency from 160 Hertz to 400 Hertz, inclusive, provided that such one-third octave band sound level exceeds the sound level of each adjacent one-third octave band, or;

    (c) 15 dB for such one-third octave band with a center frequency from 25 Hertz to 125 Hertz, inclusive, provided such one-third octave band sound level exceeds the sound level of each adjacent one-third octave band.

15. Residential areas, for the purpose of this guideline, are areas, where human beings live, including apartments, hospitals, schools, seasonal residences, and mobile homes, as well as year round residences, since these are places where people sleep and often spend extended periods of time. A quiet environment is necessary in both urban and rural residential areas in order to prevent activity interference and annoyance, and to permit the hearing mechanism to recuperate if it is exposed to higher levels of noise during other periods of the day.

16. Summer - the months of May to September, inclusive.

17. Winter - the months of October to April, inclusive.

ENVIRONMENTAL SOUND LEVEL OBJECTIVES:

SCHEDULE A

RESIDENTIAL AREA:

Continuous or Intermittent Sounds

	L_{eq} (24)	L_{dn}	$L_{eq}(1)$ (day) 7:00 a.m. to 10:00 p.m.	$L_{eq}(1)$ (night) 10:00 p.m. to 7:00 a.m.
a) MAXIMUM DESIRABLE	-	55	55	45
b) MAXIMUM ACCEPTABLE				
i) Summer or year round operations	-	60	60	50
ii) predominant discrete tone (s) or appreciable impulsive/impact character	-	55	55	45
iii) winter operations only or temporary operations	-	65	65	55

SCHEDULE B

COMMERCIAL AREAS: (excluding residential areas)

Continuous or Intermittent Sounds

	$L_{eq(24)}$	L_{dn}	$L_{eq(1)}$ (day) 7:00 a.m. to 10:00 p.m.	$L_{eq(1)}$ (night) 10:00 p.m. to 7:00 a.m.
a) MAXIMUM DESIRABLE	-	55	55	45
b) MAXIMUM ACCEPTABLE	-	70	70	60

SCHEDULE C

~~INDUSTRIAL AREAS:~~

Continuous or Intermittent Sounds

	$L_{eq(24)}$	L_{dn}	$L_{eq(1)}$ (day) 7:00 a.m. to 10:00 p.m.	$L_{eq(1)}$ (night) 10:00 p.m. to 7:00 a.m.
a) MAXIMUM DESIRABLE	70	-	70	70
b) MAXIMUM ACCEPTABLE	70	-	70	70

Appendix B
Certificates of Calibration

CERTIFICATE of CALIBRATION

Make :	Norsonic	Reference # :	133811
Model :	NOR140	Customer :	Dillon Consulting Ltd Burlington, ON
Descr. :	SLM Type 1		
Serial # :	1403048	P. Order :	73000
Asset # :	NAN		

Cal. status : Received in spec's, no adjustment made.

Navair Technologies certifies that the above listed instrument was calibrated on date noted and was released from this laboratory performing in accordance with the specifications set forth by the manufacturer.

Unless otherwise noted in the calibration report a 4:1 accuracy ratio was maintained for this calibration.

Our calibration system complies with the requirements of ISO-17025 standard, working standards used for calibration are certified by or traceable to the National Research Council of Canada or the National Institute of Standards and Technology.

Calibrated : Mar 18, 2014 By : T. Beilin

Cal. Due : Mar 18, 2015

Temperature : 23 °C ± 2 °C Relative Humidity : 30% to 70%

Standards used : J-216 J-303 J-512

Navair Technologies

REPAIR AND CALIBRATION TRACEABLE TO NRC AND NIST

6375 Dixie Rd. Mississauga, ON, L5T 2E7 http: // www.navair.com

Phone : 905 565 1584 Fax: 905 565 8325 e-Mail: navair @ navair.com

6375 Dixie Rd Unit# 7,
Mississauga, ON L5T 2E7
Tel: (905)565-1583
Fax: (905)565-8325

Form:NOR140	Approved by:JR	Date:Nov/10	ver1.0

Calibration Report part of Certificate: 133811

Make	Model	Serial	Asset
Norsonic	NOR140	1403048	nan

With mike NOR1225 s# 72837 preamp 1209 s#12539
TYPE 1 Specs

Test	Reading	In/Out

Freq.Response
Tested with dummy mike IEC61672-1 limits
WTG Curve Check

kHz	Min	A	Max	
31.5	72.6	74.4	76.6	In
63	86.3	87.8	89.3	In
0.125	96.4	97.8	99.4	In
0.25	103.9	105.3	106.8	In
0.5	109.4	110.8	112.2	In
1	112.9	114.0	115.1	In
2	113.6	115.1	116.8	In
4	113.4	114.9	116.6	In
8	109.8	112.8	115.0	In
12.5	103.7	109.8	112.7	In
		C		
31.5	109.0	110.9	113.0	In
63	111.7	113.2	114.7	In
0.125	112.3	113.8	115.3	In
0.25	112.5	114.0	115.4	In
0.5	112.6	114.0	115.4	In
1	112.9	114.0	115.1	In
2	112.2	113.8	115.4	In
4	111.6	113.1	114.8	In
8	107.9	110.9	113.1	In
12.5	101.8	107.9	110.8	In

6375 Dixie Rd Unit# 7,
Mississauga, ON L5T 2E7
Tel: (905)565-1583
Fax: (905)565-8325

133811

Test		Reading		In/Out
		Z		
31.5	112.0	113.9	116.0	In
63	112.5	114.0	115.5	In
0.125	112.5	114.0	115.5	In
0.25	112.5	114.0	115.4	In
0.5	112.6	114.0	115.4	In
1	112.9	114.0	115.1	In
2	112.4	114.0	115.6	In
4	112.4	114.0	115.6	In
8	110.9	114.0	116.1	In
12.5	108.0	114.0	117.0	In
Scale Test with microphone				
Scale				
dBc @1kHz				
I/P dB				
120dB Range				
114	113.5	114.0	114.5	In
104	103.5	104.1	104.5	In
94	93.5	94.1	94.5	In
130dB Range				
114	113.0	114.0	115.0	In
114.1				
110dB Range				
104	103.0	104.1	105.0	In
94	93.0	94.1	95.0	In
100dB Range				
94	83.0	94.1	95.0	In
Impulse Test				Pass
Fast/Slow				Pass
AC O/P				Pass

CERTIFICATE of CALIBRATION

Make :	Norsonic	Reference # :	133812
Model :	1251	Customer :	Dillon Consulting Ltd Oakville, ON
Descr. :	Sound cal 114dB 1KHz		
Serial # :	31746	P. Order :	73000
Asset # :	NAN		

Cal. status : Received in spec's, no adjustment made.

Navair Technologies certifies that the above listed instrument was calibrated on date noted and was released from this laboratory performing in accordance with the specifications set forth by the manufacturer.

Unless otherwise noted in the calibration report a 4:1 accuracy ratio was maintained for this calibration.

Our calibration system complies with the requirements of ISO-17025 standard, working standards used for calibration are certified by or traceable to the National Research Council of Canada or the National Institute of Standards and Technology.

Calibrated : Mar 19, 2014 By : J. Raposo

Cal. Due : Mar 19, 2015

Temperature : 23 °C ± 2 °C Relative Humidity : 30% to 70%

Standards used : J-163 J-261 J-282 J-508

Navair Technologies

REPAIR AND CALIBRATION TRACEABLE TO NRC AND NIST

6375 Dixie Rd. Mississauga, ON, L5T 2E7 http: // www.navair.com

Phone : 905 565 1584 Fax: 905 565 8325 e-Mail: navair @ navair.com

6375 Dixie Rd Unit# 7,
Mississauga, ON L5T 2E7
Tel: (905)565-1583
Fax: (905)565-8325

Form:NOR1251	Approved By:JR Sep07	ver 1.0

Calibration Report part of Certificate #: 133812

Make	Model	Serial	Asset	Cal. By
Norsonic	1251	31746	nan	jr

Test		Min	Reading	Max	In/Out
SPL					
114dB	98.9kPa	113.8	114.0	114.2	In
Freq. Accuracy					
1000Hz		998.0	1000.5	1002	In

Appendix C

Noise Data and Sound Power Level Calculations

DILLON CONSULTING

Source Name	Briquetter - normal operation					
Measurement Distance (m)	3					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 1	Read 2	Read 3	Avg.	Avg.	
Frq (Hz)						
25	65.1	65.5	63.5	64.7		
31.5	79.4	78.9	79	79.1	**80.2**	**97.7**
40	71.1	78.9	68.8	72.9		
50	72.8	78	69.2	73.3		
63	74.2	82.4	73.6	76.7	**80.0**	**97.5**
80	72.8	79.6	72.7	75.0		
100	77.3	80.8	76.6	78.2		
125	83.3	86.9	83.8	84.7	**86.4**	**103.9**
160	77.4	81.6	78	79.0		
200	81.3	82.2	80.7	81.4		
250	80.5	83.7	81.5	81.9	**85.8**	**103.4**
315	78.8	81.2	78.8	79.6		
400	81	82.6	80.6	81.4		
500	81.8	83.7	81.3	82.3	**87.2**	**104.7**
630	83.3	83.8	82.9	83.3		
800	85.8	86.2	85.2	85.7		
1000	84.9	85.6	84.8	85.1	**89.3**	**106.8**
1250	81.6	82	81.3	81.6		
1600	82.9	82.7	82.1	82.6		
2000	80.4	81.2	80.1	80.6	**86.7**	**104.2**
2500	82	82.7	82.2	82.3		
3150	80.8	81.7	80.5	81.0		
4000	81.3	81.7	80.7	81.2	**85.8**	**103.4**
5000	81	81.6	80.2	80.9		
6300	81.6	82.1	80.9	81.5		
8000	81.1	81.3	80.6	81.0	**85.5**	**103.0**
10000	79.5	79.7	78.7	79.3		

Source Name	Excel baler - combined												
Measurement Distance (m)	3												
Data Type	1/3 Octave											1/1 Octave	PWL (dB)
	Read 7	Read 8	Read 9	Read 10	Read 11	Read 12	Read 13	Read 14	Read 15	Read 16	Avg.	Avg.	
Frq (Hz)													
25	63.3	69.5	68.1	68.5	80.1	66.7	67.5	68.4	75	64.4	69.2		
31.5	71.4	83.8	84.4	78.8	81.7	79.1	78.2	76.8	86.3	76.1	79.7	**80.4**	**97.9**
40	59.3	74.2	72.4	63.6	81	69.3	63.6	72.7	75.2	61.1	69.2		
50	62.8	79.7	77.6	62.4	72	81.8	68.7	77.1	68	56.8	70.7		
63	71.9	80.1	77.7	68.7	73.2	74.6	72.5	75.6	67.7	63.9	72.6	**76.3**	**93.8**
80	56.6	80.8	74.8	74.4	75.8	71.1	68.4	73.2	69.6	65.2	71.0		
100	57.2	79	74.3	74.4	75.5	73.3	68	70.2	70.3	64.8	70.7		
125	61.8	81.3	80.4	78.9	77.4	76.9	67.2	75.8	76.1	63.6	73.9	**77.2**	**94.8**
160	67.7	81.4	72.3	77.5	73.6	76.5	67.4	70	72.7	62.1	72.1		
200	64.3	84.2	71.5	76.1	74.1	75.9	68.7	70.3	73.2	63	72.1		
250	79.5	87	80.2	81.7	77.6	82.8	78.7	84.3	82.6	81.1	81.6	**82.9**	**100.4**
315	68.5	85.4	74.3	79.6	76.4	78.3	70.6	75.2	76.1	70.3	75.5		
400	58.5	84.8	71.2	80.8	77.9	80.7	70.2	73.8	75.2	65.4	73.9		
500	66.4	86.6	75.5	83.6	77.9	82.2	74.2	75.6	78	75.2	77.5	**80.9**	**98.4**
630	62	86.6	74.8	81.8	76.1	83.4	72.1	77.3	79.6	67.6	76.1		
800	70.2	87.9	82.2	83	79.8	83.9	77.4	81.6	83.2	77.3	80.7		
1000	74	87.4	76.3	81.6	76.3	83.6	72	77.1	79.7	65.6	77.4	**83.5**	**101.0**
1250	77.4	86.9	79.1	80.6	74.3	83.9	71.7	76.6	79.2	63.7	77.3		
1600	64.6	87.6	79	81.7	74.2	84.6	72.4	78.3	80.5	62.8	76.6		
2000	71.3	87.5	80.4	81.8	76.4	84.3	71.5	78.9	82	64	77.8	**82.1**	**99.6**
2500	73.1	86.1	78.7	81.4	77.4	83.3	71.6	78.6	80.8	63.3	77.4		
3150	63.5	85.8	80.5	80	76.1	82.8	71.4	77.8	79.8	61.3	75.9		
4000	63	85.3	79.4	79.4	76	82.5	69.8	76.9	79	62.2	75.4	**80.0**	**97.5**
5000	62.4	84.3	77.8	78	76	80.8	68.7	75.3	77.8	60.8	74.2		
6300	65.6	83	76.2	76.9	75.4	79.9	68	73.7	76	62.1	73.7		
8000	66.5	81.5	74.8	75.7	73.9	78.3	66.1	73	74.2	58.3	72.2	**77.0**	**94.5**
10000	60.3	79.2	73.2	73.2	72.1	76.6	64.2	71.8	72.8	57.4	70.1		

Source Name	Air compressor					
Measurement Distance (m)	2					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 17	Read 18	Read 19	Avg.	Avg.	
Frq (Hz)						
25	59	59.7	59.7	59.5		
31.5	74.3	75.1	75.2	74.9	**75.3**	**89.3**
40	63.2	63.4	62.8	63.1		
50	61.3	61.6	61	61.3		
63	60	59.1	58.7	59.3	**65.3**	**79.3**
80	60.7	60.8	60.7	60.7		
100	66	65.4	66.9	66.1		
125	65.1	65.1	64.8	65.0	**71.5**	**85.5**
160	68.6	68.3	68.3	68.4		
200	70.3	70.4	70.5	70.4		
250	65.6	65.8	65.8	65.7	**73.1**	**87.1**
315	68.2	67.4	66.9	67.5		
400	73.6	73.2	73.3	73.4		
500	65.1	65.2	65.2	65.2	**74.4**	**88.4**
630	63.9	64.2	62.7	63.6		
800	61	60.6	60.7	60.8		
1000	58.8	59	59.4	59.1	**63.9**	**77.9**
1250	56.3	56.1	56.9	56.4		
1600	57.8	58.3	58.4	58.2		
2000	61.3	61.3	61.4	61.3	**65.0**	**79.0**
2500	60.7	60.8	60.2	60.6		
3150	60	60.2	60.3	60.2		
4000	61.2	61.4	61.5	61.4	**65.0**	**79.0**
5000	59	58.5	58.8	58.8		
6300	51.9	51.2	51.2	51.4		
8000	51.9	51.7	51.7	51.8	**57.4**	**71.4**
10000	53.7	54.2	54.3	54.1		

Source Name	Briquetter - normal operation (from outside door 12)					
Measurement Distance (m)		5				
Data Type		1/3 Octave			1/1 Octave	PWL (dB)
	Read 20	Read 21	Read 22	Avg.	Avg.	
Frq (Hz)						
25	65.5	69.1	65.8	66.8		
31.5	67	74.7	67.7	69.8	**72.9**	**94.9**
40	61.7	77.5	62.7	67.3		
50	59.6	71.4	59.9	63.6		
63	65.2	73	65	67.7	**70.1**	**92.0**
80	58.5	73	56.7	62.7		
100	59.2	73	58.5	63.6		
125	67.7	76.5	66.7	70.3	**72.8**	**94.7**
160	64.4	74.7	64.1	67.7		
200	66.9	75	70.7	70.9		
250	62.2	73.6	62.4	66.1	**72.9**	**94.8**
315	62.2	71.1	61.6	65.0		
400	61.9	68.5	61.9	64.1		
500	61.3	68	60.8	63.4	**68.9**	**90.8**
630	63.2	68.8	62.3	64.8		
800	62.7	66.6	62.6	64.0		
1000	62.8	65.3	62.5	63.5	**67.5**	**89.5**
1250	58	62.8	57.6	59.5		
1600	58.5	63.6	58.6	60.2		
2000	58.6	64.1	58.1	60.3	**64.2**	**86.2**
2500	55.4	61.5	54.5	57.1		
3150	55.9	62.2	55.2	57.8		
4000	53.8	61.1	53.7	56.2	**61.2**	**83.1**
5000	52.7	58.3	53.2	54.7		
6300	49.9	56	51.1	52.3		
8000	49.3	54.3	50.7	51.4	**56.6**	**78.6**
10000	50	53.4	51.8	51.7		

Source Name	Liebherr 934 mobile crane on steel tracks dropping material, engine and hydraulics						
Measurement Distance (m)			10				
Data Type			1/3 Octave			1/1 Octave	PWL (dB)
	Read 26	Read 27	Read 28	Read 29	Avg.	Avg.	
Frq (Hz)							
25	61.1	61.3	58.8	60.6	60.5		
31.5	76	76	72	68.6	73.2	**73.6**	**101.6**
40	61.4	62	62.3	58.9	61.2		
50	63.1	62.7	69.3	66	65.3		
63	70.7	70	78.6	75.5	73.7	**74.5**	**102.5**
80	61.2	61.2	62.8	62	61.8		
100	65.7	65.9	67.8	68.6	67.0		
125	72.8	73.4	72.7	75	73.5	**74.8**	**102.8**
160	64	65.4	65	63.1	64.4		
200	62.8	64.8	63.8	62.7	63.5		
250	61.7	62.3	59.3	59.1	60.6	**70.0**	**98.0**
315	68.3	69.4	67.4	67.8	68.2		
400	71.6	73.4	67.5	70.7	70.8		
500	75.6	76.6	68.2	73.7	73.5	**77.5**	**105.5**
630	75.9	76.8	69.9	70.8	73.4		
800	72.7	74.2	67.3	69.4	70.9		
1000	75.8	77.7	69	71.6	73.5	**78.0**	**106.0**
1250	77.8	79.2	68.9	72.4	74.6		
1600	79.2	80.6	71.2	73.6	76.2		
2000	78.2	79.8	70.6	73.8	75.6	**80.7**	**108.7**
2500	80.3	81	69.7	72.9	76.0		
3150	80.3	81.7	70.6	73.9	76.6		
4000	80.2	81.1	69.5	73.1	76.0	**80.7**	**108.7**
5000	79.4	80	68.8	71.9	75.0		
6300	78	78.9	67.7	70.4	73.8		
8000	76.1	77.4	66	68.8	72.1	**77.0**	**105.0**
10000	74.8	75.6	63.9	66.3	70.2		

Source Name	Sierra electric shear - combined, #1 loose									
Measurement Distance (m)	15									
Data Type	1/3 Octave								1/1 Octave	PWL (dB)
	Read 30	Read 31	Read 32	Read 33	Read 34	Read 35	Read 36	Avg.	Avg.	
Frq (Hz)										
25	65.4	75.8	81.1	62.3	64.4	61.2	61.8	67.4		
31.5	73	80	83.3	76.6	73.7	76.2	77.3	77.2	**78.3**	**109.8**
40	70.9	73.2	78.2	67.1	65.5	65	70.4	70.0		
50	69	67.8	72.2	67	62.4	63	65	66.6		
63	74.5	68.9	71.6	75.3	63.8	61.1	64.2	68.5	**73.8**	**105.3**
80	75.2	68.7	72.7	73.9	68.5	68.1	69.8	71.0		
100	77	72.1	78.7	76.3	70.9	68.2	72.6	73.7		
125	69.7	66.8	72.1	77	68.9	64.7	69.1	69.8	**75.9**	**107.5**
160	70.7	65.1	68.7	74.3	67.1	63.5	67.6	68.1		
200	71.5	64.2	67.3	74.5	63.3	64.5	64.7	67.1		
250	69.2	61.1	63.3	74.1	59.7	59.9	62.3	64.2	**70.9**	**102.4**
315	70.8	63.1	65.6	71.6	64.3	64.4	65.2	66.4		
400	76.3	70.9	71.6	74.6	71.2	71.4	73.6	72.8		
500	79.9	65.1	67.6	72.6	64.6	62.2	64.2	68.0	**75.7**	**107.2**
630	81.1	69.3	71.3	72.8	66.8	66.9	67.7	70.8		
800	81.3	68.3	72.8	75	66.6	65.1	65.7	70.7		
1000	82.8	67.2	71.7	73.9	65.9	65.1	65.5	70.3	**75.2**	**106.7**
1250	84.8	66.3	71.3	71.8	66.6	65	66	70.3		
1600	84	67.3	71.6	71.6	66.8	65.2	67.3	70.5		
2000	82.8	66.2	70.6	70.4	65.2	64.7	65.5	69.3	**74.1**	**105.6**
2500	83.2	65.4	70.5	67	61.8	62	63.7	67.7		
3150	81.8	65	70.1	64.9	62	61.1	62.9	66.8		
4000	80.8	63.6	68.9	62.9	59.1	59.6	61.2	65.2	**70.1**	**101.6**
5000	78.5	61.6	66.7	60.6	57.8	57.3	59.4	63.1		
6300	77.1	60.7	65.9	58.9	57.6	54.9	56.9	61.7		
8000	74.5	57.8	63.2	55.4	51.4	52	54.3	58.4	**64.0**	**95.5**
10000	71.8	55.1	60.5	52	48.8	48.9	52.2	55.6		

Source Name	Liebherr 934 tracks placing #1 loose material on Sierra hopper tray, Sierra shear off				
Measurement Distance (m)		10			
Data Type		1/3 Octave		1/1 Octave	PWL (dB)
	Read 37	Read 38	Avg.	Avg.	
Frq (Hz)					
25	66.6	64.6	65.6		
31.5	72.4	71.7	72.1	**73.7**	**101.7**
40	67.9	63.9	65.9		
50	68.3	70	69.2		
63	75.5	72.8	74.2	**75.9**	**103.9**
80	69.4	64.1	66.8		
100	73.6	71	72.3		
125	72.7	71.6	72.2	**75.9**	**103.9**
160	66.5	68.5	67.5		
200	69.7	66.9	68.3		
250	70.1	66.6	68.4	**73.5**	**101.5**
315	72.6	66.3	69.5		
400	77.7	73.2	75.5		
500	75.5	69.5	72.5	**77.9**	**105.9**
630	72.7	66.8	69.8		
800	74.2	68.8	71.5		
1000	70.9	64.8	67.9	**74.1**	**102.1**
1250	71.3	63.7	67.5		
1600	74.1	67.2	70.7		
2000	72.6	64.7	68.7	**73.5**	**101.5**
2500	69.5	61.7	65.6		
3150	67.9	61.5	64.7		
4000	68.3	61.6	65.0	**69.5**	**97.5**
5000	68.2	60.9	64.6		
6300	67.5	59.9	63.7		
8000	65.1	58	61.6	**66.6**	**94.6**
10000	62.2	55.9	59.1		

Source Name	Liebherr 934 rubber loading #2 prepared into B train					
Measurement Distance (m)	10					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 39	Read 40	Read 41	Avg.	Avg.	
Frq (Hz)						
25	57.3	57.2	64.1	59.5		
31.5	63.7	63.7	75.3	67.6	**78.1**	**106.1**
40	78.6	78.3	76	77.6		
50	68.8	68	74	70.3		
63	68.5	65.9	73	69.1	**73.5**	**101.5**
80	65.3	60.1	71.3	65.6		
100	64.7	59.4	70.1	64.7		
125	67.6	59.9	64.9	64.1	**68.6**	**96.6**
160	64.4	56.6	65.5	62.2		
200	60.7	56.4	64.6	60.6		
250	62.6	59.3	60.4	60.8	**68.0**	**96.0**
315	66.4	66.1	65.4	66.0		
400	68.2	67.7	66.8	67.6		
500	66.1	66.3	64.2	65.5	**71.6**	**99.6**
630	67	69.3	65.3	67.2		
800	67.5	69.4	66	67.6		
1000	63.8	67.8	63.5	65.0	**71.1**	**99.1**
1250	65.4	68.4	64.3	66.0		
1600	65.8	69.2	65	66.7		
2000	65.1	70.3	65.6	67.0	**71.5**	**99.5**
2500	63.7	70.2	65.7	66.5		
3150	62.8	70.8	64.6	66.1		
4000	61.3	69.9	63.5	64.9	**69.8**	**97.7**
5000	59.4	69.5	62.1	63.7		
6300	58.3	67.7	60.6	62.2		
8000	56.8	66.2	58.4	60.5	**65.5**	**93.5**
10000	54.9	64.7	57.7	59.1		

Source Name	Michigan L90 loader engine rev					
Measurement Distance (m)	5					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 42	Read 43	Read 44	Avg.	Avg.	
Frq (Hz)						
25	63	62.6	59.1	61.6		
31.5	68.5	70.4	68.4	69.1	**80.3**	**102.2**
40	79.7	80.1	79.8	79.9		
50	65.8	65.9	65.2	65.6		
63	68.5	69.4	69.6	69.2	**73.7**	**95.7**
80	70.7	70	71.4	70.7		
100	69.6	70.1	69.3	69.7		
125	71.6	71.7	71.5	71.6	**77.3**	**99.2**
160	74.5	75	74.7	74.7		
200	72.7	72.5	71.5	72.2		
250	73.2	74.1	72.7	73.3	**80.8**	**102.8**
315	77.9	79.3	80.3	79.2		
400	68.5	68.2	68.7	68.5		
500	70.4	70.2	70.4	70.3	**76.6**	**98.5**
630	74.1	73.9	75.3	74.4		
800	72.7	72.8	71.1	72.2		
1000	69.3	68.6	68.1	68.7	**75.7**	**97.6**
1250	71.8	71.4	70.1	71.1		
1600	72.2	72.3	72.1	72.2		
2000	73.6	73.9	73.6	73.7	**77.1**	**99.0**
2500	70.9	70.9	69.4	70.4		
3150	68.9	68.4	68.2	68.5		
4000	65.2	65.3	64.5	65.0	**70.7**	**92.7**
5000	62.1	61.8	61.2	61.7		
6300	59.3	59.4	58	58.9		
8000	55.3	55.4	54.5	55.1	**61.3**	**83.2**
10000	54.3	54.1	53.2	53.9		

Source Name	Liebherr 924 rubber dropping rail cut offs					
Measurement Distance (m)		7				
Data Type		1/3 Octave			1/1 Octave	PWL (dB)
	Read 45	Read 46	Read 47	Avg.	Avg.	
Frq (Hz)						
25	64	63.8	66.6	64.8		
31.5	66.3	65.1	66	65.8	**69.5**	**94.4**
40	62.5	62.6	64.8	63.3		
50	67.2	66.9	67.9	67.3		
63	78.9	79.4	80.1	79.5	**79.9**	**104.8**
80	66.1	66.5	66.8	66.5		
100	67.7	67.3	68.1	67.7		
125	74.3	76.3	75.5	75.4	**76.7**	**101.6**
160	66.4	68.9	69.5	68.3		
200	69.2	70.3	72.1	70.5		
250	69.7	70	72.3	70.7	**75.5**	**100.4**
315	70.3	70.3	72.7	71.1		
400	72.8	75.3	75.9	74.7		
500	79.1	83	84.6	82.2	**88.3**	**113.2**
630	86.1	87.6	86.9	86.9		
800	84.4	86	86.3	85.6		
1000	79.6	83.5	85.4	82.8	**88.7**	**113.6**
1250	82.2	82.5	83.2	82.6		
1600	81.7	81.5	80.8	81.3		
2000	86.5	88.2	87.5	87.4	**90.6**	**115.5**
2500	84	87	88.9	86.6		
3150	82.4	81.2	82.3	82.0		
4000	82.7	83.4	82.6	82.9	**86.4**	**111.3**
5000	80.8	78	79.1	79.3		
6300	79	78	78.4	78.5		
8000	76	74.1	73.5	74.5	**80.5**	**105.3**
10000	73	70	70	71.0		

Source Name	Liebherr 924 rubber loading B train with #1 prepared						
Measurement Distance (m)			8				
Data Type			1/3 Octave			1/1 Octave	PWL (dB)
	Read 48	Read 49	Read 50	Read 51	Avg.	Avg.	
Frq (Hz)							
25	66.5	62.6	63.5	64.7	64.3		
31.5	75.9	63.9	65.7	69.1	68.7	**71.2**	**97.2**
40	74.6	59.6	61.2	64	64.9		
50	78.8	67.6	65.8	69	70.3		
63	83.9	74.6	77	77.9	78.4	**79.9**	**105.9**
80	87.5	68.7	63	70.8	72.5		
100	87.3	72.6	62.2	69.2	72.8		
125	88.4	73.4	68.8	69.6	75.1	**78.9**	**105.0**
160	89.6	75.8	63.8	67.8	74.3		
200	82.9	71.4	66.3	69.5	72.5		
250	79.2	71.1	69.1	69.7	72.3	**77.6**	**103.7**
315	80.6	70.3	72.1	71.7	73.7		
400	81.3	72.6	74.3	75.4	75.9		
500	79.3	75.5	76.4	77.5	77.2	**81.7**	**107.8**
630	75.8	76.3	77.9	80.4	77.6		
800	76.9	73	80.9	79.2	77.5		
1000	74.4	73.9	77.5	78	76.0	**81.3**	**107.4**
1250	74.7	73.8	76.7	78.8	76.0		
1600	73.9	73.6	76	76.9	75.1		
2000	72.8	73.8	76.5	78.2	75.3	**79.9**	**105.9**
2500	71.9	74.3	75.6	77.5	74.8		
3150	70.1	73.8	73.7	76	73.4		
4000	66.9	73.3	70.6	74.7	71.4	**76.4**	**102.4**
5000	63.8	71.6	68.4	72.3	69.0		
6300	61.1	70.2	66.4	70.5	67.1		
8000	57.1	67.8	62.6	67.9	63.9	**69.4**	**95.5**
10000	53.7	65.2	59.7	65.2	61.0		

Source Name	Cyclone outside door 4					
Measurement Distance (m)	5					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 52	Read 53	Read 54	Avg.	Avg.	
Frq (Hz)						
25	74.1	73.4	73.1	73.5		
31.5	72.1	71.5	71.6	71.7	**76.3**	**98.2**
40	66.7	66.8	67.1	66.9		
50	68.3	67.4	66.5	67.4		
63	73.4	72.2	72.7	72.8	**75.2**	**97.1**
80	70.1	68.6	69	69.2		
100	75.6	73.5	73.7	74.3		
125	75.7	73.9	74.2	74.6	**78.1**	**100.0**
160	69.4	69.1	69.4	69.3		
200	77.4	77.2	78	77.5		
250	69	68.3	68.6	68.6	**78.4**	**100.3**
315	66.8	66.6	66.7	66.7		
400	72.1	71.3	72	71.8		
500	67.1	66.2	67	66.8	**73.7**	**95.6**
630	66.4	64.6	64.9	65.3		
800	64.3	63.2	63.3	63.6		
1000	63.3	64.2	64.7	64.1	**69.1**	**91.0**
1250	65.2	65	65.2	65.1		
1600	65.4	65	65.3	65.2		
2000	65.1	64.9	65.2	65.1	**70.2**	**92.1**
2500	65.6	66	66	65.9		
3150	68.8	68.9	69	68.9		
4000	72	71.8	71.7	71.8	**75.3**	**97.3**
5000	70.6	70.5	70.4	70.5		
6300	71.1	71.2	71.2	71.2		
8000	72	72.3	72.2	72.2	**76.7**	**98.7**
10000	72.3	72.6	72.5	72.5		

Source Name	Liebherr 934 loading Sierra shear hopper with #2 loose					
Measurement Distance (m)		10				
Data Type		1/3 Octave			1/1 Octave	PWL (dB)
	Read 55	Read 56	Read 57	Avg.	Avg.	
Frq (Hz)						
25	62.2	65	65.3	64.2		
31.5	65.3	65.2	69.5	66.7	**71.1**	**99.0**
40	60.8	65.9	75.5	67.4		
50	68.9	71.2	79	73.0		
63	78.1	76.3	78.9	77.8	**79.4**	**107.4**
80	65.5	67.2	74.2	69.0		
100	71.5	71.7	74.7	72.6		
125	71.3	72.7	74.5	72.8	**77.1**	**105.1**
160	68.9	71.1	74.5	71.5		
200	68.1	70.2	71.7	70.0		
250	65.2	67.7	69.8	67.6	**74.6**	**102.6**
315	68.5	73.3	71.6	71.1		
400	69.4	78.3	74.6	74.1		
500	69.4	79.7	75.2	74.8	**78.9**	**106.8**
630	68.5	78.2	73.2	73.3		
800	68.6	79.4	74.1	74.0		
1000	70.4	79.4	74.4	74.7	**79.6**	**107.6**
1250	69.6	81.6	75.4	75.5		
1600	69.8	81.6	74.7	75.4		
2000	69.7	81.6	74	75.1	**79.8**	**107.8**
2500	68.8	81.4	73.4	74.5		
3150	68.5	81.7	73.3	74.5		
4000	68.5	81	71.8	73.8	**78.6**	**106.6**
5000	68.4	80.3	71.1	73.3		
6300	66.7	79.3	69.4	71.8		
8000	65.1	77.7	67.6	70.1	**75.1**	**103.1**
10000	63.2	76.4	65.8	68.5		

Source Name	Sierra electric shear - combined, #2 loose							
Measurement Distance (m)			10					
Data Type			1/3 Octave				1/1 Octave	PWL (dB)
	Read 58	Read 59	Read 60	Read 61	Read 62	Avg.	Avg.	
Frq (Hz)								
25	71.5	75.1	61.6	61.5	58.8	65.7		
31.5	75.1	73.3	67.9	67.5	66.3	70.02	**72.5**	**100.5**
40	74	69.8	60.1	65.5	61.6	66.2		
50	76.7	62.1	57.9	64	60.6	64.26		
63	80.6	66.9	64.8	65.7	65.1	68.62	**72.4**	**100.4**
80	78.7	65.3	64.5	69.1	66.2	68.76		
100	79.3	67.9	64.7	70.1	66.3	69.66		
125	75.2	62.4	59.7	71.4	62.3	66.2	**72.2**	**100.2**
160	73.7	63.4	61.1	66	61.6	65.16		
200	71	60.9	62.7	65.3	60.7	64.12		
250	69	54.4	53.6	57.9	53.6	57.7	**66.3**	**94.3**
315	67.7	56.9	56.7	60.7	59.4	60.28		
400	76.9	74.5	72.5	71.7	69.8	73.08		
500	74.4	63.9	66.1	68.1	62.6	67.02	**75.0**	**103.0**
630	74	66.1	66.8	68.4	65.5	68.16		
800	71.6	63.5	66.5	66.7	63.2	66.3		
1000	73.2	61.5	67.6	68.2	63.6	66.82	**70.7**	**98.7**
1250	71.7	60	63	65.5	61.3	64.3		
1600	70.7	60.8	64.9	67.2	67.1	66.14		
2000	69.5	58.4	61.8	64.8	63.3	63.56	**69.0**	**97.0**
2500	68.4	57.4	60	63.6	60.4	61.96		
3150	67.4	57.2	58.9	62.3	60.2	61.2		
4000	65.8	56.4	57.8	61.4	58.8	60.04	**64.6**	**92.6**
5000	64.7	53.5	55.2	58.6	56.3	57.66		
6300	62.8	52.6	53.2	56.3	54.3	55.84		
8000	61.1	50.3	52.2	53.8	52.6	54	**58.8**	**86.8**
10000	58.7	48.3	47.2	51	49.1	50.86		

Source Name	EZ crusher, cyclone off						
Measurement Distance (m)	6						
Data Type	1/3 Octave					1/1 Octave	PWL (dB)
	Read 1	Read 2	Read 3	Read 4	Avg.	Avg.	
Frq (Hz)							
25	69.6	61.7	64.5	60.3	64.0		
31.5	67.2	64.8	66.4	63.8	65.6	**70.3**	**93.8**
40	65.7	66.2	68.5	65.8	66.6		
50	80.5	89.8	89	83.3	85.7		
63	80.8	90.6	90.5	86.3	87.1	**89.6**	**113.2**
80	86.7	67.3	68	84.3	76.6		
100	71.5	73.3	75.9	71.6	73.1		
125	71.9	75.3	75	72.8	73.8	**77.0**	**100.6**
160	69.8	66.9	66.7	68.9	68.1		
200	67.8	65.5	65.8	68.7	67.0		
250	70.1	66.4	68.1	68.6	68.3	**73.1**	**96.6**
315	72	66.9	66	72.4	69.3		
400	69.6	64.2	64.2	69.7	66.9		
500	69.7	69.1	68.4	69.7	69.2	**74.5**	**98.1**
630	76.2	71.1	67.8	72.1	71.8		
800	74	68.8	65.3	69.1	69.3		
1000	66.9	68.1	65	67.9	67.0	**73.0**	**96.5**
1250	68.3	70.1	66.5	67.1	68.0		
1600	69.4	73	66.2	66.2	68.7		
2000	68.4	74.8	65.8	64.9	68.5	**73.2**	**96.7**
2500	65.3	74.2	68.8	63.8	68.0		
3150	65.3	77.3	68.7	63.1	68.6		
4000	61.3	77.4	68.8	59.5	66.8	**72.3**	**95.9**
5000	61	78.6	69.5	59.2	67.1		
6300	59.9	79.3	70.5	58.6	67.1		
8000	58.3	80.7	71.3	57.4	66.9	**71.5**	**95.0**
10000	55.9	81.2	71.5	55.4	66.0		

Source Name	Granulator					
Measurement Distance (m)	3					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 5	Read 6	Read 7	Avg.	Avg.	
Frq (Hz)						
25	69.1	69.1	70.2	69.5		
31.5	66.8	65.3	67.3	66.5	**74.4**	**91.9**
40	72	70.9	71.8	71.6		
50	76.7	75.2	78.1	76.7		
63	78.7	79.3	79.7	79.2	**81.4**	**98.9**
80	68.4	67.8	68.8	68.3		
100	73.9	73.4	74.7	74.0		
125	76.2	75.3	77.1	76.2	**80.1**	**97.6**
160	77.1	74.4	75.1	75.5		
200	77.5	75.9	76.9	76.8		
250	76.4	75.5	77.7	76.5	**82.9**	**100.4**
315	80.2	79	80.9	80.0		
400	87.7	85	86.7	86.5		
500	85.7	86.3	89	87.0	**90.5**	**108.1**
630	83	82.1	83	82.7		
800	80.6	82.4	83.4	82.1		
1000	88	88.5	87.8	88.1	**90.2**	**107.7**
1250	83.7	83.8	84.1	83.9		
1600	82.1	83.3	85	83.5		
2000	82.3	81.2	84	82.5	**87.8**	**105.3**
2500	83	81.4	84.5	83.0		
3150	84.4	82.9	85.5	84.3		
4000	80.7	81.8	83.6	82.0	**87.2**	**104.7**
5000	78.6	79.1	81.3	79.7		
6300	75.8	76.4	78.9	77.0		
8000	73.5	73.8	76.8	74.7	**79.7**	**97.2**
10000	70.3	70.6	73.2	71.4		

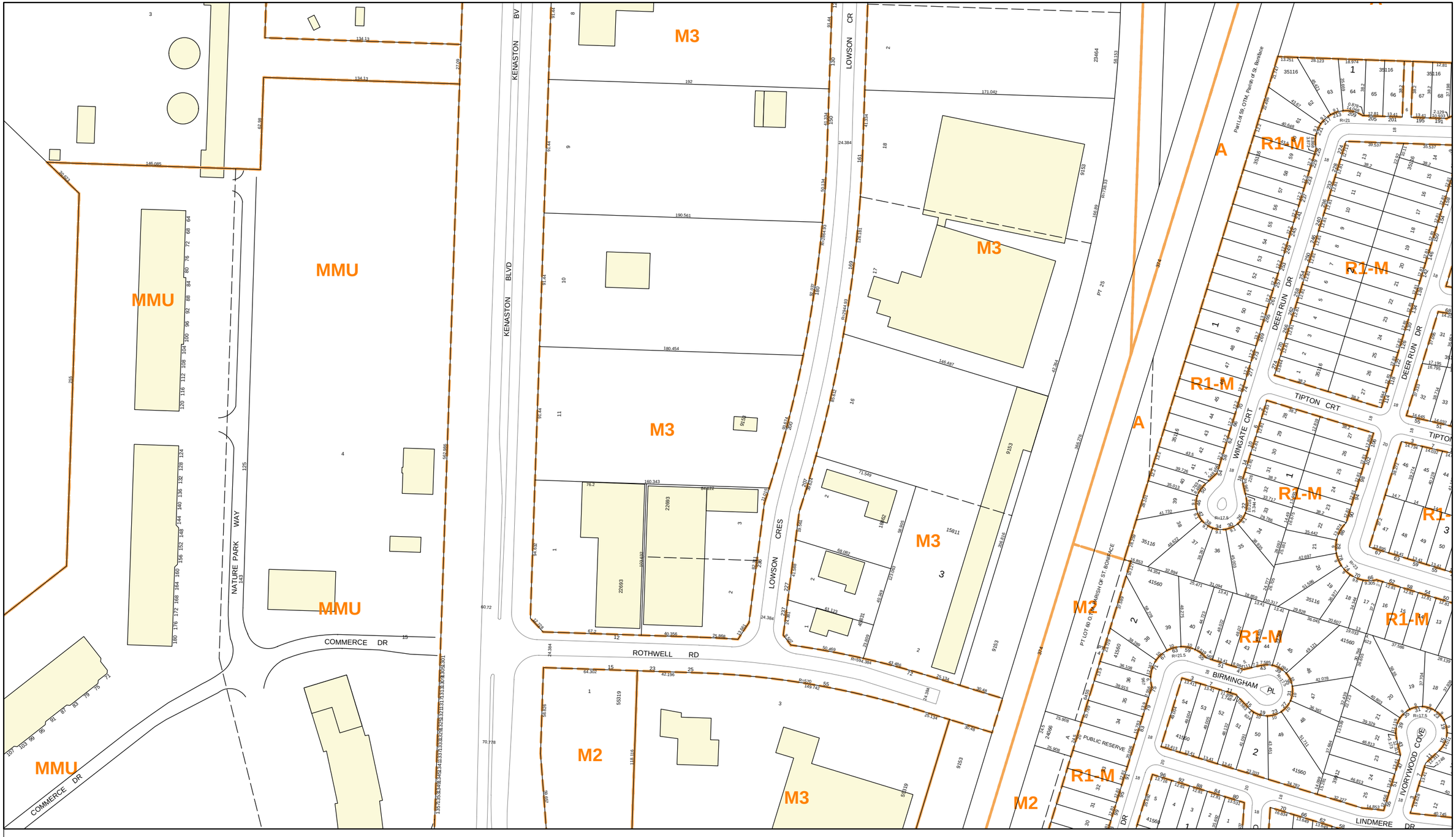
Source Name	Pacific Canton shear line with shaker tables - indoors					
Measurement Distance (m)	3					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 8	Read 9	Read 10	Avg.	Avg.	
Frq (Hz)						
25	66.9	68	69	68.0		
31.5	79.5	79.1	78.6	79.1	**81.2**	**98.7**
40	74.1	78.4	77.2	76.6		
50	83.1	84.3	83.5	83.6		
63	83.4	83.8	83.1	83.4	**87.5**	**105.0**
80	79.2	82.3	79.5	80.3		
100	82.6	87.6	82.9	84.4		
125	86.9	88.2	86.1	87.1	**92.5**	**110.0**
160	90.1	90.4	89.3	89.9		
200	89.7	90.1	89.2	89.7		
250	85.6	86.4	85.1	85.7	**92.4**	**109.9**
315	85.7	87.7	86.2	86.5		
400	92.6	92.4	92.6	92.5		
500	87.5	88.4	87.3	87.7	**95.2**	**112.8**
630	89.1	90.5	89.8	89.8		
800	88	89.8	89.4	89.1		
1000	88.4	89	89	88.8	**93.7**	**111.2**
1250	87.4	90	89.2	88.9		
1600	88.1	91.5	90.4	90.0		
2000	87.7	91.4	91.3	90.1	**94.7**	**112.2**
2500	87.8	90	91.1	89.6		
3150	87.7	90.7	91.4	89.9		
4000	86.3	89.2	91.1	88.9	**93.7**	**111.2**
5000	84.8	88.1	90.1	87.7		
6300	82.5	86.3	89.1	86.0		
8000	80.7	84.4	87.1	84.1	**89.0**	**106.5**
10000	78.2	81.8	84.3	81.4		

Source Name	Pacific Canton shear line with shaker tables - combined outdoors							
Measurement Distance (m)	3							
Data Type	1/3 Octave						1/1 Octave	PWL (dB)
	Read 11	Read 12	Read 13	Read 14	Read 15	Avg.	Avg.	
Frq (Hz)								
25	63.9	65	62	65.6	63.3	64.0		
31.5	70.8	70.8	69.3	72.1	73.1	71.2	**72.9**	**90.4**
40	63.9	63.1	61.6	69.1	70.3	65.6		
50	65.1	64.8	64.9	70.9	71.6	67.5		
63	67	66	66.4	73.2	72.9	69.1	**73.7**	**91.2**
80	67.9	65.1	62.9	76.6	77	69.9		
100	68.7	67.6	67.5	71.6	72.3	69.5		
125	71.7	70.9	70.9	74.8	75.1	72.7	**76.0**	**93.5**
160	69.2	68.1	68	74.5	74.3	70.8		
200	65.2	64.7	64.8	75.4	75.3	69.1		
250	64.9	65.3	64.5	73.3	73.8	68.4	**75.0**	**92.5**
315	70.1	70.6	70.2	75	74.8	72.1		
400	72.6	73.7	72.7	75.3	75.2	73.9		
500	73.2	74.6	73.8	75.6	75.9	74.6	**78.8**	**96.4**
630	72.7	73.7	73.3	73.8	74.5	73.6		
800	72.8	75.4	74.7	74.3	74.3	74.3		
1000	76.6	78.3	78.6	76.4	76.8	77.3	**81.5**	**99.0**
1250	76.2	79.8	78.7	76.7	77.2	77.7		
1600	78.5	81	80.4	78.4	78.9	79.4		
2000	79.9	82.5	82.3	79.4	80.2	80.9	**85.6**	**103.1**
2500	81.2	83	82.9	80.4	81.6	81.8		
3150	81.5	83.8	83.5	81.2	81.7	82.3		
4000	82	84.4	84.1	81.5	82.1	82.8	**87.3**	**104.9**
5000	82.1	84.3	83.9	80.8	81.5	82.5		
6300	81.3	83.9	83.4	80.2	80.9	81.9		
8000	79.3	81.8	81.6	78.5	79.1	80.1	**85.0**	**102.5**
10000	77	79.2	78.8	75.9	76.5	77.5		

Source Name	Building exhaust vent (x5)					
Measurement Distance (m)	3					
Data Type	1/3 Octave				1/1 Octave	PWL (dB)
	Read 17	Read 18	Read 19	Avg.	Avg.	
Frq (Hz)						
25	65.9	78.3	72.8	72.3		
31.5	62.5	76.9	70.4	69.9	**75.2**	**98.7**
40	60	76	67.2	67.7		
50	58.1	73.2	63.9	65.1		
63	56.7	70.6	61.6	63.0	**68.3**	**91.9**
80	58.4	66.8	60.9	62.0		
100	55.6	64	59.8	59.8		
125	61.4	63.6	62.2	62.4	**68.2**	**91.8**
160	67.1	66	64.8	66.0		
200	66.5	65.2	64.2	65.3		
250	60.2	60.8	60.2	60.4	**66.9**	**90.5**
315	55	57.4	57.4	56.6		
400	57.1	56.5	56.1	56.6		
500	57.5	61	61.2	59.9	**63.0**	**86.5**
630	57.7	57.2	57.7	57.5		
800	60	58.2	57.5	58.6		
1000	54.2	56	55	55.1	**61.1**	**84.6**
1250	53.4	54.5	53.3	53.7		
1600	51.5	53.4	53.5	52.8		
2000	53.4	53.3	54.6	53.8	**60.3**	**83.8**
2500	58.1	57.5	58.4	58.0		
3150	57.7	58.7	58.4	58.3		
4000	55.5	57.2	56	56.2	**62.0**	**85.5**
5000	56.1	57.3	57.2	56.9		
6300	55.6	56.2	57	56.3		
8000	53.6	54.4	54.5	54.2	**59.2**	**82.7**
10000	50.7	51.9	52.1	51.6		

Appendix D
Zoning Map

DILLON CONSULTING



CITY OF WINNIPEG
PLANNING, PROPERTY AND DEVELOPMENT DEPT.
Property and Information Services Division - MAPPING

Scale: 1:2500

N
W E
S

Appendix E

Model Calculations (CADNA Output)

DILLON CONSULTING

Receiver: POR4
ID: POR4
X: 629203.11
Y: 5521615.87
Z: 6
Ground: 0

ISO	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
	Pacific and Canton Shear - outs	PCS	629094	5521659.3	2	0	0	119.5	119.5	1	117.49	8.92	0	52.4	0	-1.43	19.97	6.58	2.84	0	0	0	0	0	0	45.76	45.76
	Sierra Shear - Processing No 1	SS1	629055.9	5521691.8	3	0	0	121.6	121.6	1	165.68	8.54	0	55.39	0	-1.23	15.32	0.91	1.34	0	0	0	0	0	0	50.77	50.77
	LB934 - Material Handling	LB934_MH	629044.1	5521683.2	4	0	0	114.4	114.4	1	172.67	8.66	0	55.74	0	-1.43	15.56	0.68	2.8	0	0	0	0	0	0	41.69	41.69
	Material Handling - Rail cuts (	MHRC	629071.6	5521666.5	3.5	0	0	117	-88	1	140.94	8.75	0	53.98	0	-1.48	18.61	1.4	1.52	0	0	0	0	0	0	44.33	-88
	Ring Mill	RM	628996.2	5521658.7	3.5	0	0	108.8	108.8	1	211.29	8.42	0	57.5	0	-0.88	10.9	0.51	1.63	0	0	0	0	0	0	39.66	39.66
	EZ Crusher	EZC	629064.1	5521582.9	2.5	0	0	103.5	103.5	1	142.87	5.86	0	54.1	0	-1.32	12.99	0.49	1.92	0	0	0	0	0	0	35.83	35.83
	B Train loading - No 1 material	BTL	629038.1	5521707.1	4	0	0	105.3	105.3	1	188.56	8.61	0	56.51	0	-1.39	13.24	0.58	2.07	0	0	0	0	0	0	34.89	34.89
	Cyclone (overall)	CYCL	629077.5	5521600.3	3	0	0	101	101	1	126.63	8.96	0	53.05	0	-1.09	19.67	6.29	3.4	0	0	0	0	0	0	25.95	25.95
	Michigan L90 loader	ML90	629049.5	5521643.3	2.5	0	0	102.1	102.1	1	156.11	8.52	0	54.87	0	-0.5	15.68	1.16	1.17	0	0	0	0	0	0	30.84	30.84
	Pacific Shear and Shaker tables	PSST	629100.2	5521657.5	1.5	0	0	98.2	98.2	1	111.09	3.75	0	51.91	0	-1.01	0	0	1.49	0	0	0	0	0	0	45.78	45.78
	Briquetter outside of the bldg	BTQ	629103.6	5521689.2	2	0	0	94.5	94.5	1	123.67	8.93	0	52.85	0	-0.68	19.51	6.75	0.8	0	0	0	0	0	0	22.03	22.03
	Granulator	GRN	629084.4	5521604.3	2.5	0	0	92.5	92.5	1	119.36	4.25	0	52.54	0	-1.4	0	0	1.23	0	0	0	0	0	0	40.12	40.12
	Mint Coil Processing - indoor	MCP	629110.9	5521685.2	1.5	0	0	91.6	91.6	1	115.47	3.75	0	52.25	0	-1.04	0	0	1.59	0	0	0	0	0	0	38.76	38.76
	Excel Bailer - indoor	EB	629116.7	5521658.3	2	0	0	85.9	85.9	1	96.36	4	0	50.68	0	-1.28	0	0	1.17	0	0	0	0	0	0	35.32	35.32
	Air Compressor - indoor	AC	629124.6	5521686.6	3.5	0	0	68.4	68.4	1	105.71	4.75	0	51.48	0	-1.32	0	0	0.75	0	0	0	0	0	0	17.46	17.46

RLS	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Ds	Dbm	Dz	z	Kw	RL	Dbeb	Dbew	LtotT	LtotN
	Onsite Truck Route	TRK_Rt	629052.6	5521616	0.5	0	0	66.9	12.2	69.18	150.65	8.4	-33.11	0	21.3	2.01	0.82	0	0	0	12.53	-42.17
	Onsite Truck Route	TRK_Rt	629040.6	5521573	0.5	0	0	61.3	6.6	18.77	168.07	5.43	-34.15	0	12.82	0.34	0.59	0	0	0	14.3	-40.4
	Onsite Truck Route	TRK_Rt	629033.4	5521548	0.5	0	0	63.9	9.2	34.16	182.9	5.44	-34.96	0	12.27	0.32	0.54	0	0	0	16.64	-38.06
	Onsite Truck Route	TRK_Rt	629025.2	5521519	0.5	0	0	62.8	8.1	26.62	202.88	5.45	-35.96	0	11.55	0.3	0.47	0	0	0	15.29	-39.41
	Onsite Truck Route	TRK_Rt	629021.3	5521505	0.5	0	0	51.9	-2.8	2.16	213.2	5.46	-36.44	0	11.18	0.29	0.44	0	0	0	4.27	-50.43
	Onsite Truck Route	TRK_Rt	629066	5521655	0.5	0	0	60	5.3	13.99	142.6	8.42	-32.6	0	21.77	2.19	0.84	0	0	0	5.63	-49.07
Limit. Value D/N:	0	0																				
Level D/N:	54.4135	53.963																				

Receiver: POR3
ID: POR3
X: 629234.3
Y: 5521688.62
Z: 6
Ground: 0

ISO	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
	Sierra Shear - Processing No 1	SS1	629055.9	5521691.8	3	0	0	121.6	121.6	1	178.46	8.56	0	56.03	0	-1.22	14.82	0.89	1.43	0	0	0	0	0	0	50.55	50.55
	Pacific and Canton Shear - outs	PCS	629094	5521659.3	2	0	0	119.5	119.5	1	143.38	8.93	0	54.13	0	-1.42	19.92	6.22	3.27	0	0	0	0	0	0	43.64	43.64
	LB934 - Material Handling	LB934_MH	629044.1	5521683.2	4	0	0	114.4	114.4	1	190.27	8.67	0	56.59	0	-1.43	14.85	0.64	3	0	0	0	0	0	0	41.37	41.37
	Material Handling - Rail cuts (	MHRC	629071.6	5521666.5	3.5	0	0	117	-88	1	164.22	8.77	0	55.31	0	-1.48	18.11	1.27	1.73	0	0	0	0	0	0	43.3	-88
	Ring Mill	RM	628996.2	5521658.7	3.5	0	0	108.8	108.8	1	239.97	8.44	0	58.6	0	-0.89	9.86	0.46	1.78	0	0	0	0	0	0	39.46	39.46
	B Train loading - No 1 material	BTL	629038.1	5521707.1	4	0	0	105.3	105.3	1	197.1	7.32	0	56.89	0	-1.43	6.59	0.37	2.14	0	0	0	0	0	0	41.13	41.13
	EZ Crusher	EZC	629064.1	5521582.9	2.5	0	0	103.5	103.5	1	200.35	8.86	0	57.04	0	-1.47	17.77	2.61	2.37	0	0	0	0	0	0	27.81	27.81
	Michigan L90 loader	ML90	629049.5	5521643.3	2.5	0	0	102.1	102.1	1	190.35	8.55	0	56.59	0	-0.46	14.57	1	1.38	0	0	0	0	0	0	29.98	29.98
	Cyclone (overall)	CYCL	629077.5	5521600.3	3	0	0	101	101	1	180	8.96	0	56.11	0	-0.93	19.39	5.6	4.08	0	0	0	0	0	0	22.33	22.33
	Pacific Shear and Shaker tables	PSST	629100.2	5521657.5	1.5	0	0	98.2	98.2	1	137.73	3.75	0	53.78	0	-0.96	0	0	1.76	0	0	0	0	0	0	43.6	43.6
	Briquetter outside of the bldg	BTQ	629103.6	5521689.2	2	0	0	94.5	94.5	1	130.74	8.94	0	53.33	0	-0.64	19.37	6.79	0.83	0	0	0	0	0	0	21.61	21.61
	Mint Coil Processing - indoor	MCP	629110.9	5521685.2	1.5	0	0	91.6	91.6	1	123.56	3.75	0	52.84	0	-1.03	0	0	1.66	0	0	0	0	0	0	38.09	38.09
	Granulator	GRN	629084.4	5521604.3	2.5	0	0	92.5	92.5	1	172.04	4.25	0	55.71	0	-1.38	0	0	1.63	0	0	0	0	0	0	36.53	36.53
	Excel Bailer - indoor	EB	629116.7	5521658.3	2	0	0	85.9	85.9	1	121.55	4	0	52.69	0	-1.25	0	0	1.39	0	0	0	0	0	0	33.05	33.05
	Air Compressor - indoor	AC	629124.6	5521686.6	3.5	0	0	68.4	68.4	1	109.74	4.75	0	51.81	0	-1.31	0	0	0.77	0	0	0	0	0	0	17.11	17.11

RLS	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Ds	Dbm	Dz	z	Kw	RL	Dbeb	Dbew	LtotT	LtotN
	Onsite Truck Route	TRK_Rt	629050.2	5521607	0.5	0	0	67.9	13.2	86.48	201.32	8.44	-35.88	0	19.82	1.61	0.72	0	0	0	12.21	-42.49
	Onsite Truck Route	TRK_Rt	629038.3	5521565	0.5	0	0	48.7	-6	1.04	231.68	8.45	-37.26	0	18.93	1.43	0.65	0	0	0	-7.46	-62.16
	Onsite Truck Route	TRK_Rt	629033.3	5521547	0.5	0	0	64.1	9.4	36.21	245.82	5.47	-37.84	0	10.09	0.26	0.35	0	0	0	16.19	-38.51
	Onsite Truck Route	TRK_Rt	629027.5	5521527	0.5	0	0	56.6	1.9	6.37	262.68	5.48	-38.5	0	9.55	0.25	0.3	0	0	0	8.53	-46.17
	Onsite Truck Route	TRK_Rt	629023.8	5521514	0.5	0	0	61.7	7	20.8	273.76	5.49	-38.92	0	9.2	0.24	0.28	0	0	0	13.6	-41.1
	Onsite Truck Route	TRK_Rt	629066	5521655	0.5	0	0	60	5.3	13.99	171.79	8.46	-34.36	0	20.99	1.94	0.79	0	0	0	4.65	-50.05
Limit. Value D/N:	0	0																				
Level D/N:	53.643	53.2201																				

Receiver: POR5
ID: POR5
X: 629165.11
Y: 5521468.39
Z: 5.5

Ground: 0

ISO	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
	Sierra Shear - Processing No 1	SS1	629055.9	5521691.8	3	0	0	121.6	121.6	1	248.71	8.38	0	58.91	0	-1.22	12.53	0.65	1.85	0	0	0	0	0	0	49.53	49.53
	Pacific and Canton Shear - outs	PCS	629094	5521659.3	2	0	0	119.5	119.5	1	203.73	8.69	0	57.18	0	-1.39	19.92	5.15	4.17	0	0	0	0	0	0	39.66	39.66
	LB934 - Material Handling	LB934_MH	629044.1	5521683.2	4	0	0	114.4	114.4	1	246.54	8.5	0	58.84	0	-1.43	12.73	0.51	3.59	0	0	0	0	0	0	40.66	40.66
	Material Handling - Rail cuts (	MHRC	629071.6	5521666.5	3.5	0	0	117	-88	1	219.07	8.56	0	57.81	0	-1.47	16.44	0.97	2.18	0	0	0	0	0	0	42.02	-88
	Ring Mill	RM	628996.2	5521658.7	3.5	0	0	108.8	108.8	1	254.44	5.32	0	59.11	0	-1.16	4.75	0.02	1.85	0	0	0	0	0	0	44.27	44.27
	EZ Crusher	EZC	629064.1	5521582.9	2.5	0	0	103.5	103.5	1	152.73	5.67	0	54.68	0	-1.49	15.91	0.49	2	0	0	0	0	0	0	32.41	32.41
	Cyclone (overall)	CYCL	629077.5	5521600.3	3	0	0	101	101	1	158.41	8.72	0	55	0	-0.94	19.32	5.91	3.83	0	0	0	0	0	0	23.78	23.78
	B Train loading - No 1 material	BTL	629038.1	5521707.1	4	0	0	105.3	105.3	1	270.37	8.47	0	59.64	0	-1.39	10.47	0.44	2.68	0	0	0	0	0	0	33.93	33.93
	Michigan L90 loader	ML90	629049.5	5521643.3	2.5	0	0	102.1	102.1	1	209.68	8.36	0	57.43	0	-0.4	13.95	0.93	1.5	0	0	0	0	0	0	29.58	29.58
	Pacific Shear and Shaker tables	PSST	629100.2	5521657.5	1.5	0	0	98.2	98.2	1	199.96	3.5	0	57.02	0	-0.87	0	0	2.31	0	0	0	0	0	0	39.73	39.73
	Granulator	GRN	629084.4	5521604.3	2.5	0	0	92.5	92.5	1	158.14	4	0	54.98	0	-1.39	0	0	1.53	0	0	0	0	0	0	37.36	37.36
	Briquetter outside of the bldg	BTQ	629103.6	5521689.2	2	0	0	94.5	94.5	1	229.27	8.69	0	58.21	0	-0.33	18.76	5.14	1.29	0	0	0	0	0	0	16.58	16.58
	Mint Coil Processing - indoor	MCP	629110.9	5521685.2	1.5	0	0	91.6	91.6	1	223.5	3.5	0	57.99	0	-1.01	0	0	2.42	0	0	0	0	0	0	32.17	32.17
	Excel Bailer - indoor	EB	629116.7	5521658.3	2	0	0	85.9	85.9	1	195.99	3.75	0	56.84	0	-1.2	0	0	1.97	0	0	0	0	0	0	28.27	28.27
	Air Compressor - indoor	AC	629124.6	5521686.6	3.5	0	0	68.4	68.4	1	221.97	4.5	0	57.93	0	-1.26	0	0	1.3	0	0	0	0	0	0	10.41	10.41

RLS	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Ds	Dbm	Dz	z	Kw	RL	Dbeb	Dbew	LtotT	LtotN
	Onsite Truck Route	TRK_Rt	629058.1	5521635	0.5	0	0	63.1	8.4	28.31	198.32	8.22	-35.74	0	19.87	1.62	0.72	0	0	0	7.45	-47.25
	Onsite Truck Route	TRK_Rt	629046.1	5521593	0.5	0	0	66.4	11.7	60.49	172.11	5.28	-34.38	0	13.08	0.37	0.59	0	0	0	18.9	-35.8
	Onsite Truck Route	TRK_Rt	629033.7	5521549	0.5	0	0	63.4	8.7	30.76	154.11	5.29	-33.33	0	14.04	0.42	0.66	0	0	0	16.05	-38.65
	Onsite Truck Route	TRK_Rt	629026.1	5521522	0.5	0	0	62.5	7.8	25.14	149.03	5.3	-33.01	0	14.37	0.45	0.68	0	0	0	15.16	-39.54
	Onsite Truck Route	TRK_Rt	629021.8	5521507	0.5	0	0	56.5	1.8	6.19	148.43	3	-32.97	-4.03	0	0	0	0	0	0	19.45	-35.25
	Onsite Truck Route	TRK_Rt	629066.8	5521656	0.5	0	0	59	4.3	11.21	211.67	8.25	-36.37	0	19.73	1.61	0.71	0	0	0	2.93	-51.77
	Onsite Truck Route	TRK_Rt	629062.8	5521650	0.5	0	0	53	-1.7	2.78	208.58	8.22	-36.23	0	19.55	1.55	0.7	0	0	0	-2.79	-57.49

Limit. Value D/N: 0 0

Level D/N: 52.4558 52.0376

Receiver: POR6
ID: POR6
X: 629130.69
Y: 5521349.62
Z: 5.5
Ground: 0

ISO	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
	Sierra Shear - Processing No 1	SS1	629055.9	5521691.8	3	0	0	121.6	121.6	1	350.29	8.38	0	61.89	0	-1.69	9.1	0.47	2.4	0	0	0	0	0	0	49.9	49.9
	Pacific and Canton Shear - outs	PCS	629094	5521659.3	2	0	0	119.5	119.5	1	311.84	8.69	0	60.88	0	-1.75	19.64	3.9	5.5	0	0	0	0	0	0	35.27	35.27
	LB934 - Material Handling	LB934_MH	629044.1	5521683.2	4	0	0	114.4	114.4	1	344.62	5.53	0	61.75	0	-1.74	4.77	0.02	4.46	0	0	0	0	0	0	45.13	45.13
	Material Handling - Rail cuts (	MHRC	629071.6	5521666.5	3.5	0	0	117	-88	1	322.34	8.56	0	61.17	0	-1.72	12.81	0.67	2.93	0	0	0	0	0	0	41.77	-88
	Ring Mill	RM	628996.2	5521658.7	3.5	0	0	108.8	108.8	1	337.05	5.53	0	61.55	0	-1.42	5.22	0.03	2.23	0	0	0	0	0	0	41.22	41.22
	EZ Crusher	EZC	629064.1	5521582.9	2.5	0	0	103.5	103.5	1	242.65	5.67	0	58.7	0	-1.35	13.26	0.32	2.67	0	0	0	0	0	0	30.24	30.24
	B Train loading - No 1 material	BTL	629038.1	5521707.1	4	0	0	105.3	105.3	1	369.24	5.5	0	62.35	0	-1.79	4.76	0.01	3.3	0	0	0	0	0	0	36.71	36.71
	Cyclone (overall)	CYCL	629077.5	5521600.3	3	0	0	101	101	1	256.3	8.72	0	59.17	0	-0.63	18.24	4.65	4.81	0	0	0	0	0	0	19.38	19.38
	Michigan L90 loader	ML90	629049.5	5521643.3	2.5	0	0	102.1	102.1	1	304.69	5.39	0	60.68	0	-1.25	5.4	0.07	2.03	0	0	0	0	0	0	35.19	35.19
	Pacific Shear and Shaker tables	PSST	629100.2	5521657.5	1.5	0	0	98.2	98.2	1	309.39	3.5	0	60.81	0	-1.24	0	0	3.11	0	0	0	0	0	0	35.51	35.51
	Granulator	GRN	629084.4	5521604.3	2.5	0	0	92.5	92.5	1	258.9	4	0	59.26	0	-1.48	0	0	2.2	0	0	0	0	0	0	32.5	32.5
	Briquetter outside of the bldg	BTQ	629103.6	5521689.2	2	0	0	94.5	94.5	1	340.71	8.69	0	61.65	0	-0.56	17.81	3.98	1.72	0	0	0	0	0	0	13.89	13.89
	Mint Coil Processing - indoor	MCP	629110.9	5521685.2	1.5	0	0	91.6	91.6	1	336.16	3.5	0	61.53	0	-1.41	0	0	3.1	0	0	0	0	0	0	28.34	28.34
	Excel Bailer - indoor	EB	629116.7	5521658.3	2	0	0	85.9	85.9	1	308.99	3.75	0	60.8	0	-1.57	0	0	2.7	0	0	0	0	0	0	23.95	23.95
	Air Compressor - indoor	AC	629124.6	5521686.6	3.5	0	0	68.4	68.4	1	337.06	4.5	0	61.55	0	-1.54	0	0	1.72	0	0	0	0	0	0	6.64	6.64

RLS	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Ds	Dbm	Dz	z	Kw	RL	Dbeb	Dbew	LtotT	LtotN
	Onsite Truck Route	TRK_Rt	629050.3	5521608	0.5	0	0	67.9	13.2	85.87	270.27	5.28	-38.79	0	9.13	0.24	0.27	0	0	0	19.96	-34.74
	Onsite Truck Route	TRK_Rt	629034.6	5521552	0.5	0	0	63.2	8.5	29.52	224.16	5.29	-36.93	0	11.13	0.3	0.42	0	0	0	15.18	-39.52
	Onsite Truck Route	TRK_Rt	629029.7	5521535	0.5	0	0	56.8	2.1	6.72	210.85	3	-36.33	-4.28	0	0	0	0	0	0	16.2	-38.5
	Onsite Truck Route	TRK_Rt	629024.9	5521518	0.5	0	0	63.1	8.4	28.79	198.56	3	-35.75	-4.24	0	0	0	0	0	0	23.14	-31.56
	Onsite Truck Route	TRK_Rt	629066.9	5521656	0.5	0	0	58.9	4.2	10.85	312.91	8.26	-40.27	0	16.56	1.11	0.48	0	0	0	2.06	-52.64
	Onsite Truck Route	TRK_Rt	629062.9	5521650	0.5	0	0	53.5	-1.2	3.14	308.18	5.27	-40.12	0	7.78	0.2	0.18	0	0	0	5.62	-49.08

Limit. Value D/N: 0 0

Level D/N: 52.5018 52.1078

Receiver: POR2
ID: POR2
X: 629243.22
Y: 5521723.55
Z: 6
Ground: 0

ISO	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
	Sierra Shear - Processing No 1	SS1	629055.9	5521691.8	3	0	0	121.6	121.6	1	190.02	7.21	0	56.58	0	-1.25	12.64	0.49	1.5	0	0	0	0	0	0	52.14	52.14

	Pacific and Canton Shear - outs	PCS		629094	5521659.3	2	0	0	119.5	119.5	1	162.51	8.93	0	55.22	0	-1.41	19.97	5.82	3.57	0	0	0	0	0	0	42.19	42.19
	LB934 - Material Handling	LB934_MH		629044.1	5521683.2	4	0	0	114.4	114.4	1	203.16	7.21	0	57.16	0	-1.46	10.19	0.23	3.14	0	0	0	0	0	0	45.34	45.34
	Material Handling - Rail cuts (	MHRC		629071.6	5521666.5	3.5	0	0	117	-88	1	180.87	8.76	0	56.15	0	-1.47	17.75	1.14	1.87	0	0	0	0	0	0	42.68	-88
	Ring Mill	RM		628996.2	5521658.7	3.5	0	0	108.8	108.8	1	255.39	8.44	0	59.14	0	-0.91	9.42	0.43	1.85	0	0	0	0	0	0	39.31	39.31
	B Train loading - No 1 material	BTL		629038.1	5521707.1	4	0	0	105.3	105.3	1	205.82	7.46	0	57.27	0	-1.37	13.85	0.27	2.21	0	0	0	0	0	0	33.37	33.37
	EZ Crusher	EZC		629064.1	5521582.9	2.5	0	0	103.5	103.5	1	227.72	8.85	0	58.15	0	-1.45	17.31	2.3	2.57	0	0	0	0	0	0	26.95	26.95
	Michigan L90 loader	ML90		629049.5	5521643.3	2.5	0	0	102.1	102.1	1	209.76	8.54	0	57.43	0	-0.46	13.88	0.9	1.5	0	0	0	0	0	0	29.7	29.7
	Cyclone (overall)	CYCL		629077.5	5521600.3	3	0	0	101	101	1	206.56	8.96	0	57.3	0	-0.85	19.16	5.21	4.36	0	0	0	0	0	0	21	21
	Pacific Shear and Shaker tables	PSST		629100.2	5521657.5	1.5	0	0	98.2	98.2	1	157.6	3.75	0	54.95	0	-0.93	0	0	1.94	0	0	0	0	0	0	42.22	42.22
	Briquetter outside of the bldg	BTQ		629103.6	5521689.2	2	0	0	94.5	94.5	1	143.81	8.94	0	54.16	0	-0.61	19.44	6.5	0.9	0	0	0	0	0	0	20.62	20.62
	Mint Coil Processing - indoor	MCP		629110.9	5521685.2	1.5	0	0	91.6	91.6	1	137.88	3.75	0	53.79	0	-1.01	0	0	1.78	0	0	0	0	0	0	37	37
	Granulator	GRN		629084.4	5521604.3	2.5	0	0	92.5	92.5	1	198.65	4.25	0	56.96	0	-1.38	0	0	1.82	0	0	0	0	0	0	35.09	35.09
	Excel Bailer - indoor	EB		629116.7	5521658.3	2	0	0	85.9	85.9	1	142.45	4	0	54.07	0	-1.24	0	0	1.57	0	0	0	0	0	0	31.48	31.48
	Air Compressor - indoor	AC		629124.6	5521686.6	3.5	0	0	68.4	68.4	1	124.26	4.75	0	52.89	0	-1.31	0	0	0.85	0	0	0	0	0	0	15.94	15.94

RLS	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Ds	Dbm	Dz	z	Kw	RL	Dbeb	Dbew	LtotT	LtotN
	Onsite Truck Route	TRK_Rt	629050.3	5521608	0.5	0	0	67.9	13.2	85.72	225.1	8.43	-36.97	0	18.97	1.43	0.66	0	0	0	11.93	-42.78
	Onsite Truck Route	TRK_Rt	629037.2	5521561	0.5	0	0	59	4.3	11.17	262.49	8.44	-38.49	0	17.89	1.26	0.58	0	0	0	2.64	-52.06
	Onsite Truck Route	TRK_Rt	629032.5	5521545	0.5	0	0	62.1	7.4	22.88	276.44	5.47	-39.01	0	8.89	0.23	0.26	0	0	0	14.23	-40.47
	Onsite Truck Route	TRK_Rt	629028.8	5521531	0.5	0	0	55.4	0.7	4.84	288.05	5.47	-39.43	0	8.55	0.22	0.23	0	0	0	7.42	-47.28
	Onsite Truck Route	TRK_Rt	629024.5	5521516	0.5	0	0	62.7	8	26.29	301.31	5.48	-39.89	0	8.17	0.21	0.21	0	0	0	14.68	-40.02
	Onsite Truck Route	TRK_Rt	629066	5521655	0.5	0	0	60	5.3	13.99	190.23	8.45	-35.34	0	20.31	1.74	0.75	0	0	0	4.35	-50.35
Limit. Value D/N:	0	0																				
Level D/N:	54.3444	54.0363																				

Receiver: POR1
ID: POR1
X: 629272.63
Y: 5521820.26
Z: 6
Ground: 0

ISO	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Freq	Adiv	K0b	Agr	Abar	z	Aatm	Afol	Ahous	Cmet	CmetN	Dc	RL	LtotT	LtotN
	Sierra Shear - Processing No 1	SS1	629055.9	5521691.8	3	0	0	121.6	121.6	1	251.96	7.69	0	59.03	0	-1.14	18.86	0.8	1.87	0	0	0	0	0	0	42.98	42.98
	Pacific and Canton Shear - outs	PCS	629094	5521659.3	2	0	0	119.5	119.5	1	240.49	8.93	0	58.62	0	-1.38	19.94	4.64	4.66	0	0	0	0	0	0	37.71	37.71
	LB934 - Material Handling	LB934_MH	629044.1	5521683.2	4	0	0	114.4	114.4	1	266.48	7.65	0	59.51	0	-1.41	15.54	0.35	3.78	0	0	0	0	0	0	36.96	36.96
	Material Handling - Rail cuts (	MHRC	629071.6	5521666.5	3.5	0	0	117	-88	1	253.11	7.28	0	59.07	0	-1.48	11.1	0.35	2.44	0	0	0	0	0	0	45.84	-88
	Ring Mill	RM	628996.2	5521658.7	3.5	0	0	108.8	108.8	1	320.19	7.42	0	61.11	0	-1.12	8.23	0.19	2.16	0	0	0	0	0	0	38.43	38.43
	B Train loading - No 1 material	BTL	629038.1	5521707.1	4	0	0	105.3	105.3	1	260.46	7.81	0	59.31	0	-1.35	16.65	0.47	2.61	0	0	0	0	0	0	28.1	28.1
	EZ Crusher	EZC	629064.1	5521582.9	2.5	0	0	103.5	103.5	1	315.92	8.85	0	60.99	0	-1.79	15.65	1.71	3.12	0	0	0	0	0	0	25.55	25.55
	Michigan L90 loader	ML90	629049.5	5521643.3	2.5	0	0	102.1	102.1	1	284.86	8.54	0	60.09	0	-0.66	11.36	0.67	1.93	0	0	0	0	0	0	29.34	29.34
	Cyclone (overall)	CYCL	629077.5	5521600.3	3	0	0	101	101	1	294.06	8.96	0	60.37	0	-0.75	18.58	4.24	5.1	0	0	0	0	0	0	17.67	17.67
	Pacific Shear and Shaker tables	PSST	629100.2	5521657.5	1.5	0	0	98.2	98.2	1	237.17	3.75	0	58.5	0	-0.91	0	0	2.6	0	0	0	0	0	0	38	38
	Briquetter outside of the bldg	BTQ	629103.6	5521689.2	2	0	0	94.5	94.5	1	213.89	7.44	0	57.6	0	-0.12	17.93	3.17	1.22	0	0	0	0	0	0	17.87	17.87
	Mint Coil Processing - indoor	MCP	629110.9	5521685.2	1.5	0	0	91.6	91.6	1	210.8	3.75	0	57.48	0	-0.93	0	0	2.33	0	0	0	0	0	0	32.69	32.69
	Granulator	GRN	629084.4	5521604.3	2.5	0	0	92.5	92.5	1	286.51	4.25	0	60.14	0	-1.53	0	0	2.36	0	0	0	0	0	0	31.51	31.51
	Excel Bailer - indoor	EB	629116.7	5521658.3	2	0	0	85.9	85.9	1	224.91	4	0	58.04	0	-1.2	0	0	2.17	0	0	0	0	0	0	26.87	26.87
	Air Compressor - indoor	AC	629124.6	5521686.6	3.5	0	0	68.4	68.4	1	199.45	4.75	0	57	0	-1.28	0	0	1.21	0	0	0	0	0	0	11.45	11.45

RLS	Bezeichnung	ID	X	Y	Z	Ground	ReflOrd	LxT	LxN	L/A	Dist.	hm	Ds	Dbm	Dz	z	Kw	RL	Dbeb	Dbew	LtotT	LtotN
	Onsite Truck Route	TRK_Rt	629050.6	5521609	0.5	0	0	67.8	13.1	83.72	306.79	8.43	-40.07	0	16.31	1.06	0.47	0	0	0	11.39	-43.31
	Onsite Truck Route	TRK_Rt	629038	5521564	0.5	0	0	58.2	3.5	9.16	347.56	8.44	-41.36	0	15.13	0.95	0.39	0	0	0	1.67	-53.03
	Onsite Truck Route	TRK_Rt	629032.9	5521546	0.5	0	0	63.1	8.4	28.43	364.44	8.45	-41.85	0	14.65	0.92	0.36	0	0	0	6.57	-48.13
	Onsite Truck Route	TRK_Rt	629028.2	5521530	0.5	0	0	56	1.3	5.56	379.87	5.47	-42.29	0	6.11	0.17	0.08	0	0	0	7.59	-47.11
	Onsite Truck Route	TRK_Rt	629024.2	5521515	0.5	0	0	62.3	7.6	24.03	393.4	5.48	-42.66	0	5.92	0.16	0.07	0	0	0	13.77	-40.93
	Onsite Truck Route	TRK_Rt	629066	5521655	0.5	0	0	60	5.3	13.99	264.88	8.45	-38.59	0	17.88	1.26	0.58	0	0	0	3.53	-51.17
Limit. Value D/N:	0	0																				
Level D/N:	49.4562	46.9699																				