REPORT

2300 Speers Road

Oakville, ON

Noise Impact Study

SACL #SW18077

May 25, 2018

Submitted to:

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1. Introduction

This document is a Noise Study regarding the existing manufacturing and transport facility (Facility) located at 2300 Speers Road, Oakville, Ontario. The Facility houses both Waddell Transport Ltd., a freight shipping and trucking company; and Total Lifting Solutions Inc., Kar Lift Solutions, and The Lift Superstore, a joint manufacturer and distributer of automotive and truck lifting products. This study is associated with a Site Plan Approval application to expand the paved area to the south of the building.

The objective of the study is to assess the noise impact at the neighbouring houses due to expanding the paved area over a former wooded area. This expanded paved area will permit truck traffic closer to the property line of the neighbouring houses. The emission of noise from trucks at the Facility is assessed using noise criteria developed by the Ontario Ministry of the Environment and Climate Change (MOECC).

2. Site

For the purposes of this report, Speers Road is defined as heading east-west. Therefore, the Facility is located to the south of Speers Road. An aerial view of the Facility and the surrounding area is shown in Figure 1.

The Facility includes 6 truck loading bays on the southwest side of the building and an outdoor paved area for parking and storage of transport trucks and trailers on the west side of the lot. Regular operating hours for trucks at the facility are between 7 a.m. and 5 p.m. Monday to Friday. Occasionally, trucks also arrive at the facility during the night to pick up or drop off trailers. Photos of the area cleared for the pavement expansion, the truck loading bay area, and the trailer storage area are found in Appendix A.

Approximately 5 to 10 trucks come and go from the Facility each business day. These trucks pick up trailers which are stored on the west side of the Facility or at the loading bays at the southwest side of the Facility. These trucks may idle at the Facility for about 2 minutes before departing.

Neighbouring the facility to the south is a row of houses on Wyandotte Drive. Previously, there was a wooded area approximately 26 meters deep separating the Facility from the back yards of these houses. This wooded area has been cleared, with plans of expanding the paved area of the Facility into this previously wooded area. Neighbouring the facility to the west, east and north are a variety of other commercial and industrial facilities.

3. Noise Sources

The main noise source at the Facility is the noise emitted from truck activity in the paved area on the west side of the Facility. This noise source includes trucks latching on to trailers, idling, and moving. The noise of trucks idling and moving are steady sources, while the sound of a truck latching on to a trailer is an impulsive source.

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Noise due to indoor manufacturing operations or loading of trucks at the loading bays is insignificant relative to the noise due to the outdoor activities of the trucks themselves, when observed at the critical noise receptors.

Table 1: Noise Source Summary

Source ID	Description	Overall Sound Power Level (dBA)	Source Location	Sound Attributes	Noise Control
TruckIdle1	Truck idling in storage area	96	Outdoor	Steady	None
TruckPickup	Truck moving in storage area	105	Outdoor	Steady	None
StorageImpact	Truck latching to trailer in storage area	125	Outdoor	Impulsive	None
TruckIdle2	Truck idling in loading area	96	Outdoor	Steady	None
TruckLoading	Truck moving in loading area	105	Outdoor	Steady	None
LoadingImpact	Truck latching to trailer in loading area	125	Outdoor	Impulsive	None

4. Critical Noise Receptors

The critical points of reception (PORs), where the noise impact is expected to be the greatest, occurs at the nearest noise sensitive land use, such as residential properties. The nearest residential properties are the 2-storey houses along Wyandotte Drive. These houses back directly onto the south side of the Facility property. Two residences were selected as critical points of reception for the calculations based on their proximity to the noise sources. Sound levels at the outdoor PORs are also assessed at the OPOR locations. These assessment locations are shown in Figure 1.

Industrial and commercial buildings are not usually considered a critical point of reception for noise. In this case, the buildings to the west, east, and north are not considered critical points of reception.

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Table 2: Critical Points of Reception

POR ID	Height (m)	Location
POR1	4.5	Residence on north side of Wyandotte Drive, 2nd storey
OPOR1	1.5	Outdoor receptor for POR1, rear yard
POR2	4.5	Residence on north side of Wyandotte Drive, 2nd storey
OPOR2	1.5	Outdoor receptor for POR2, rear yard

5. Sound Level Limits

MOECC Noise Publication NPC-300, *Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning* states that:

> "For sound from a stationary source..., the sound level limit at a point of reception, expressed in terms of the One Hour Equivalent Sound Level (Leq) is the higher of the applicable exclusion limit value given in Table 1, or the background sound level for that point of reception."

The residential area along Wyandotte Drive is considered a Class 1 Area, with an acoustical environment typical of an urban area. The exclusionary limits for a Class 1 Area are given below and are used to assess compliance in this study.

Table 3: Exclusion Limit Values of One-Hour Equivalent Sound Level

Time of Day	*Plane of Window of Noise Sensitive Spaces*	*Outdoor Points of Reception*
	Class 1 Area	*Class 1 Area*
07:00-19:00	50 dBA	50 dBA
19:00-23:00	50 dBA	50 dBA
23:00-07:00	45 dBA	N/A

The MOECC limits for impulsive sound sources depend on the number of impulses in a one-hour period. The exclusionary limits for impulsive sound levels in a Class 1 Area are given below.

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Table 4: Exclusion Limit Values for Impulsive Sound Level

Number of Impulses in Period of One-Hour	*Plane of Window of Noise Sensitive Spaces*	*Outdoor Points of Reception*
	Class 1 Area (07:00-23:00)/(23:00-07:00)	*Class 1 Area (07:00-23:00)*
9 or more	50/45 dBA	50 dBA
7 to 8	55/50 dBA	55 dBA
5 to 6	60/55 dBA	60 dBA
4	65/60 dBA	65 dBA
3	70/65 dBA	70 dBA
2	75/70 dBA	75 dBA
1	80/75 dBA	80 dBA

Based on the number of impulses expected at the site during the worst-case predictable hour as reported in Section 7, the sound level limit for impulsive sounds is 75 dBA during the daytime period and 75 dBA during the nighttime period at the PORs. At the OPORs, the sound level limit for impulsive sounds is 75 dBA during the daytime period.

6. Sound Level Measurements

Sound levels near the noise sources and on the property line were measured during the morning on April 20, 2018. Weather data during the site visit is found in Appendix B. Weather conditions at the site were appropriate and wind speeds on site were low during all sound level measurements.

Sound levels were measured using a Brüel and Kjær Hand-held Analyzer Type 2250 (serial number 3007997) with a Brüel and Kjær ½" Prepolarized Condenser Microphone Type 4189 (serial number 2983426). A wind shield was used for all outdoor sound level measurements, and weather conditions were suitable for measurement. Laboratory calibration certificates for the instrumentation can be provided upon request.

Sound levels were measured of truck activity at the Facility during their normal operations. Sounds from the Facility include truck traffic, idle trucks, and the impacts from trucks picking up trailers. Sounds were audible from operations to the west and across Speers street, including dumpster emptying and other truck impulses.

The sound level measurements are provided in Appendix C.

7. Sound Level Calculation Results

Sound levels at the critical noise receptors due to stationary noise sources in the Facility were calculated using the software CadnaA. Calculation details are attached in Appendix D.

For day-time hours of 07:00 to 19:00, this scenario assumes the arrival of one truck to the loading bay area and one truck to the trailer storage area during one full hour. All trucks are assumed to latch onto a trailer, idle for up to 5 minutes, then depart the Facility with the trailer. Each truck is assumed to generate one impulse during the latching operation to a trailer.

For the evening and night-time hours of 19:00 to 07:00, the worst-case-predictable scenario is assumed to be the arrival and departure of one truck to the trailer storage area, with one impulse noise.

The worst-case-predictable Facility operations scenario is summarized as follows:

Daytime – worst-case predictable hour:

- One truck arriving on site, going to loading bay area, then leaving site
- One truck idling at the loading bay area for up to 5 minutes
- One truck arriving on site, picking up a trailer at the storage area, then leaving site
- One truck idling at the storage area for up to 5 minutes

Nighttime – worst-case predictable hour:

- One truck arriving on site, picking up a trailer at the storage area, then leaving site
- One truck idling at the storage area for up to 5 minutes

Impulsive sources are assessed separately from the steady sources. Based on the truck operations at the Facility, the following impulsive sounds are assessed:

- Daytime – one impulse at the loading area and one impulse at the storage area for a total of two impulses
- Nighttime – one impulse at the storage area

The calculated sound levels at the four critical points of reception under these operating conditions are given in Table 5 and Table 6. The results are split into the predicted sound levels due to steady sources and the predicted sound levels due to impulsive sources, in keeping with the MOECC requirements.

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Table 5: Predicted Stationary Noise Source Levels at the Receptors Due to Steady Sources (Unmitigated)

Receptor	Time Period	Predicted Stationary Sound Levels L_{EQ-1hr} (dBA)	Stationary Source Sound Level Limit L_{EQ-1hr} (dBA)	Compliance
POR1	Day-time (0700 – 1900)	46	50	Yes
	Evening (1900 – 2300)	44	50	Yes
	Night-time (2300 – 0700)	44	45	Yes
OPOR1	Day-time (0700 – 1900)	50	50	Yes
	Evening (1900 – 2300)	47	50	Yes
	Night-time (2300 – 0700)	N/A	N/A	N/A
POR2	Day-time (0700 – 1900)	46	50	Yes
	Evening (1900 – 2300)	44	50	Yes
	Night-time (2300 – 0700)	44	45	Yes
OPOR2	Day-time (0700 – 1900)	47	50	Yes
	Evening (1900 – 2300)	47	50	Yes
	Night-time (2300 – 0700)	N/A	N/A	N/A

Table 6: Predicted Stationary Noise Source Levels at the Receptors Due to Impulsive Sources (Unmitigated)

Receptor	Time Period	Predicted Stationary Sound Levels L_{EQ-1hr} (dBA)	Stationary Source Sound Level Limit L_{EQ-1hr} (dBA)	Compliance
POR1	Day-time (0700 – 1900)	84	75	No
	Evening (1900 – 2300)	82	75	No
	Night-time (2300 – 0700)	82	75	No
OPOR1	Day-time (0700 – 1900)	87	75	No
	Evening (1900 – 2300)	86	75	No
	Night-time (2300 – 0700)	N/A	N/A	N/A
POR2	Day-time (0700 – 1900)	84	75	No
	Evening (1900 – 2300)	82	75	No
	Night-time (2300 – 0700)	82	75	No

Receptor	Time Period	Predicted Stationary Sound Levels L_{EQ-1hr} (dBA)	Stationary Source Sound Level Limit L_{EQ-1hr} (dBA)	Compliance
OPOR2	Day-time (0700 – 1900)	87	75	No
	Evening (1900 – 2300)	86	75	No
	Night-time (2300 – 0700)	N/A	N/A	N/A

The calculated sound levels at all receptors due to steady sources (trucks idling and moving) meet the MOECC guideline limits at the PORs and OPORs without any additional noise mitigation. However, the calculated sound levels due to impulsive sources (trucks latching onto trailers) do not meet the MOECC guideline limits. Additional noise mitigation is required to reduce these sound levels at the receptors.

8. Noise Mitigation Recommendations

Based on the calculation results, a noise barrier or earth berm is required between the expanded paved area of the Facility and the residences on the north side of Wyandotte Drive. This barrier must be a minimum of 4 meters high from grade and span the entire length of the paved area from west to east along the south property boundary, approximately 116m in length. If an earth berm is chosen, it may be set back an appropriate distance from the south property boundary to allow for a suitable berm slope.

The predicted sound levels due to impulsive sources at the critical receptors with a 4m tall barrier or earth berm along the south edge of the Facility property are given in Table 7. The resulting sound levels at all receptors meet the MOECC requirements for impulsive sources.

Table 7: Predicted Stationary Noise Source Levels at the Receptors Due to Impulsive Sources (Mitigated with 4m barrier)

Receptor	Time Period	Predicted Stationary Sound Levels L_{EQ-1hr} (dBA)	Stationary Source Sound Level Limit L_{EQ-1hr} (dBA)	Compliance
POR1	Day-time (0700 – 1900)	75	75	Yes
	Evening (1900 – 2300)	72	75	Yes
	Night-time (2300 – 0700)	72	75	Yes
OPOR1	Day-time (0700 – 1900)	72	75	Yes
	Evening (1900 – 2300)	69	75	Yes
	Night-time (2300 – 0700)	NA	NA	NA

Receptor	Time Period	Predicted Stationary Sound Levels L_{EQ-1hr} (dBA)	Stationary Source Sound Level Limit L_{EQ-1hr} (dBA)	Compliance
POR2	Day-time (0700 – 1900)	75	75	Yes
	Evening (1900 – 2300)	73	75	Yes
	Night-time (2300 – 0700)	73	75	Yes
OPOR2	Day-time (0700 – 1900)	71	75	Yes
	Evening (1900 – 2300)	69	75	Yes
	Night-time (2300 – 0700)	NA	NA	NA

9. Concluding Comments

The noise sources associated with truck activity on the planned expanded paved area at 2300 Speers Road meets the MOECC sound level limits for steady noise sources. In order to meet the sound level limits for impulsive sources, a 4m high barrier is required along the south edge of the paved area. Provided the noise mitigation is implemented as detailed in Section 8, the Facility will meet the MOECC sound level limits at all nearby sensitive receptors.

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Figures

Figure 1: Aerial view of the Facility and surrounding area

Figure 2: Aerial view of the Facility showing barrier location

Appendices

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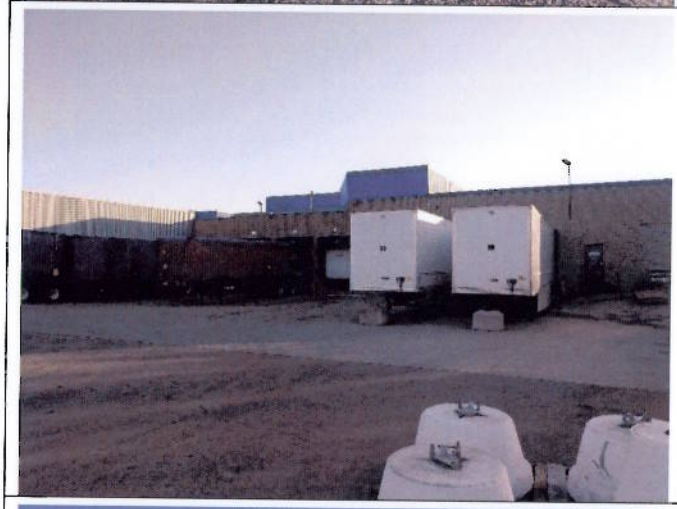
APPENDIX A – PHOTOGRAPHS OF FACILITY

	Area cleared for expanded pavement
	Truck loading bay area
	Trailer storage area

APPENDIX B – WEATHER DATA

The following weather data was obtained from Environment Canada for Burlington, Ontario, which is the nearest location to provide hourly historical data.

Table 8: Weather Data Information

Station Name	BURLINGTON PIERS (AUT)
Province	ONTARIO
Current Station Operator	Environment and Climate Change Canada - Meteorological Service of Canada
Latitude	43.3
Longitude	-79.8
Elevation	77.4
Climate Identifier	6151061
WMO Identifier	71437

Table 9: Hourly Weather Data for Burlington, Ontario, for April 20, 2018

Date	Time	Temp (°C)	Dew Point Temp (°C)	Rel Hum (%)	Wind Spd (km/h)	Stn Press (kPa)
2018-04-20	7:00 AM	0.1	-5.2	68	8	101.79
2018-04-20	8:00 AM	0.9	-5	64	9	101.85
2018-04-20	9:00 AM	1.3	-6.7	55	27	101.93
2018-04-20	10:00 AM	2.1	-6	55	21	101.99

APPENDIX C – MEASUREMENT RESULTS

Table 10: Measurement Results of Truck Activity (Steady Sources)

Msmt #	Description	Distance from Source	LAeq	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
002	truck moving forward (no trailer)	75m	60	63	60	58	52	57	57	48	41	29
004	truck backing up to trailer	40m	68	66	68	63	59	63	66	56	49	41
008	truck moving forward	40m	69	65	65	61	57	62	65	63	61	59
009	truck moving forward	60m	57	66	61	58	51	54	54	50	43	36
012	truck idling	17m	63	65	66	65	59	63	58	53	48	36
013	truck moving forward	17m	66	68	69	75	62	64	60	57	51	38

Table 11: Measurement Results of Truck Activity (Impulsive Sources)

Msmt #	Description	Distance from Source	LAImax	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
004	truck latching on to trailer	40m	84	74	73	81	82	82	78	76	78	78

APPENDIX D – CADNAA CALCULATION OUTPUT

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Report (20180505 SW18077 Model.cna)

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (m)	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (m)	1000.00
Min. Length of Section (m)	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°C)	10
rel. Humidity (%)	70
Ground Absorption G	1.00
Wind Speed for Dir. (m/s)	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (Schall 03 (1990))	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Result Table

Receiver		Lp			Limiting Value			Exceedance			Land Use
Name	ID	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB	dB	dB	
POR1	!02!	46.4	-56.9	43.5	0	0.0	0	46.4	-56.9	43.5	
POR2	!03!	45.9	-57.2	43.5	0	0.0	0	45.9	-57.2	43.5	
OPOR1	!02!	49.8	-53.8	47.3	0	0.0	0	49.8	-53.8	47.3	
OPOR2	!03!	48.7	-54.7	46.6	0	0.0	0	48.7	-54.7	46.6	

Group Day and Night

Name	Expression	Partial Sum Level Normal											
		POR1			POR2			OPOR1			OPOR2		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Root	!*	46.4	-56.9	43.5	45.9	-57.2	43.5	49.8	-53.8	47.3	48.7	-54.7	46.6
Berm	!00*												
Calibration	!01*												
Normal Trucks	!02*	46.4	-56.9	43.5	45.9	-57.2	43.5	49.8	-53.8	47.3	48.7	-54.7	46.6
Impulsive	!03*												
Environment	!04*												

Partial Day/Night

Source			Partial Level Normal										
Name	M.	ID	POR1			POR2			OPOR1			OPOR2	
			Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
LoadingImpact	~	!03!												
StorageImpact	~	!03!												
TruckIdle2		!02!	41.5		41.5	41.5		41.5	45.8		45.8	44.9		44.9
TruckIdle1		!02!	39.5			37.8			42.2			39.7		
TruckLoading		!02!	40.9	-59.1	-59.1	40.2	-59.8	-59.8	44.1	-55.9	-55.9	42.8	-57.2	-57.2
TruckPickup		!02!	39.0	-61.0	39.0	39.2	-60.8	39.2	41.9	-58.1	41.9	41.6	-58.4	41.6

Sound Sources

Point Sources

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
LoadingImpact	~	!03!	124.5	124.5	124.5	Lw	TruckImpact		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	1.00	r	17603299.56	4806935.48	1.00
StorageImpact	~	!03!	124.5	124.5	124.5	Lw	TruckImpact		0.0	0.0	0.0				60.00	0.00	60.00	0.0		(none)	1.00	r	17603273.64	4806889.15	1.00
TruckIdle2		!02!	95.5	95.5	95.5	Lw	TruckIdle		0.0	0.0	0.0				5.00	0.00	5.00	0.0		(none)	2.00	r	17603273.91	4806894.55	2.00
TruckIdle1		!02!	95.5	95.5	95.5	Lw	TruckIdle		0.0	0.0	0.0				5.00	0.00	0.00	0.0		(none)	2.00	r	17603298.21	4806933.30	2.00

Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. S		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Nig
TruckLoading		!02!	88.1	-11.9	-11.9	63.5	-36.5	-36.5	PWL-Pt	TruckTraffic		0.0	0.0	0.0							0.0		(none)	1.0	0.0	0.
TruckPickup		!02!	87.1	-12.9	87.1	63.5	-36.5	63.5	PWL-Pt	TruckTraffic		0.0	0.0	0.0							0.0		(none)	1.0	0.0	1.

Geometry Line Sources

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(m)		(m)		(m)	(m)	(m)	(m)
TruckLoading	0.00	r			17603195.43	4806974.19	0.00	0.00
					17603247.51	4806924.63	0.00	0.00
					17603278.31	4806918.19	0.00	0.00
					17603294.97	4806929.25	0.00	0.00
					17603283.49	4806941.01	0.00	0.00
					17603289.52	4806928.82	0.00	0.00
					17603300.30	4806934.56	0.00	0.00
					17603264.73	4806928.41	0.00	0.00
					17603243.48	4806932.29	0.00	0.00
					17603196.19	4806975.57	0.00	0.00
TruckPickup	2.00	r			17603194.93	4806973.59	2.00	0.00
					17603223.51	4806943.59	2.00	0.00
					17603273.14	4806894.62	2.00	0.00
					17603273.86	4806889.83	2.00	0.00
					17603230.22	4806940.77	2.00	0.00
					17603197.22	4806976.77	2.00	0.00

Receptors

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Evening	Night	Day	Evening	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
Cal Check Truck 2 Backup	~	!01!	-88.0	-88.0	-88.0	0.0	0.0	0.0		x	Total	4.00	r	17603271.86	4806901.95	4.00
POR1	+	!02!	46.4	-56.9	43.5	0.0	0.0	0.0		x	Total	4.50	r	17603314.78	4806872.34	4.50
POR2	+	!03!	45.9	-57.2	43.5	0.0	0.0	0.0		x	Total	4.50	r	17603299.22	4806854.78	4.50
OPOR1	+	!02!	49.8	-53.8	47.3	0.0	0.0	0.0		x	Total	1.50	r	17603304.21	4806883.89	1.50
OPOR2	+	!03!	48.7	-54.7	46.6	0.0	0.0	0.0		x	Total	1.50	r	17603288.22	4806862.67	1.50

Obstacles

Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height		
			left	right		horz.	vert.	Begin		End
					(m)	(m)	(m)	(m)		(m)
South Earth Berm	~	!00!	0.84	0.84				4.00	r	

Geometry Barriers

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			Coordinates			
			left	right		horz.	vert.	Begin		End	x	y	z	Ground
					(m)	(m)	(m)	(m)		(m)	(m)	(m)	(m)	(m)
South Earth Berm	~	!00!	0.84	0.84				4.00	r		17603261.72	4806841.55	4.00	0.00
											17603323.30	4806920.26	4.00	0.00

Building

Name	M.	ID	RB	Residents	Absorption	Height	
						Begin	
						(m)	
Main Building		!04!		0	0.37	6.00	r

Geometry Building

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(m)		(m)	(m)	(m)	(m)
Main Building		!04!		0	0.37	6.00	r	17603305.67	4807057.13	6.00	0.00
								17603221.00	4806970.01	6.00	0.00
								17603254.25	4806937.69	6.00	0.00
								17603294.39	4806978.99	6.00	0.00
								17603303.42	4806970.22	6.00	0.00
								17603296.21	4806962.80	6.00	0.00
								17603319.17	4806940.48	6.00	0.00
								17603370.97	4806993.77	6.00	0.00

Ground Absorption

Name	M.	ID	G
Pavement		!04!	0.1
Berm	~	!00!	1.0
PavementUnderBerm		!04!	0.1

Geometry Absorption

Name	M.	ID	G	Coordinates	
				x	y
				(m)	(m)
Pavement		!04!	0.1	17603190.32	4806969.67
				17603202.31	4806959.79
				17603177.79	4806922.75
				17603255.41	4806848.31
				17603324.55	4806935.10
				17603295.80	4806962.79
				17603302.85	4806970.02
				17603294.56	4806978.49
				17603254.26	4806937.30
				17603220.57	4806969.94
				17603236.27	4806986.60
				17603224.71	4806997.80
				17603206.63	4806971.26
				17603197.90	4806979.37
Berm	~	!00!	1.0	17603255.64	4806848.23
				17603266.42	4806836.61
				17603334.74	4806925.93
				17603324.80	4806934.90
PavementUnderBerm		!04!	0.1	17603255.78	4806847.95
				17603266.56	4806836.33
				17603334.88	4806925.65
				17603324.94	4806934.62