Scale 1:2,400
1 inch = 200 feet

100 0 100 200 Feet

N W E S

Figure 2
Noise Measurement Locations

Schnitzer Recycling
Portland, Maine

Basemap: 2001, Orthophotography, ME GIS

Epsilon Associates Inc.

G:\Projects2\ME\Portland\2187\noise.mxd

7/30/07

areas to the north and east of the Site, and two locations within the site near the western and southern borders (see comment above regarding terrain). The measurement locations depicted in Figure 2 are described below.

- Location CM1 was the continuous 12-hour measurement location, located along the northern border of the site and adjacent to the Lucas Tree property, approximately 240 feet from Riverside Street. It was chosen due to its close proximity to the nearest Residential Zoning area (there is an "R5" zone near Waldron Way). Location CM1 is considered to be very representative of the current background sound level. The primary noise source here was automobile and truck traffic along Riverside Street. There was some very intermittent pick-up truck activity on the Lucas Tree property.

- Location ST1 (Short-term 1) was also located on northern property line, but at a distance of approximately 700 feet from Riverside Street. The primary noise source here was still vehicle traffic along Riverside Street. However, due to the increased distance from the street, other sound sources such as birds and the occasional Lucas Tree truck were more audible at this location than at location CM1.

- Location ST2 was located along the edge of the terrain change area, as close as possible to the western property line. Riverside Street traffic was still the most prominent noise source, but steady noise from I-95 could also be heard, as well as a few high-altitude commercial planes flying overhead.

- Location ST3 was also along the border of the level, flat terrain but closer to the southern property line, along which there are several businesses. Riverside Street traffic was still the predominant noise source, but I-95 was much more audible than at any other location on the site.

- Location ST4 was along the Riverside Street property line, near the driveway to the existing house on the site. Sound levels here were louder than at all the other locations, due to close proximity to the street.

4.3 Measurement Methodology

Daytime sound level measurements were made for 30 minutes per location on Wednesday July 11, 2007, from approximately 10:00 a.m. to 3:00 p.m. In addition to the sampling data, one continuous programmable unattended sound level meter was placed at Location CM1. This monitor continuously measured and stored hourly sound level statistics for 12 consecutive hours, to determine the temporal variation of the background noise levels, and to confirm that the short-term sampling was indeed representative. The monitor ran from 6:00 a.m. until 6:00 p.m. on Wednesday July 11. Field personnel checked on the integrity of the continuous equipment intermittently throughout the 12-hour period. Noise sources at each location were observed and noted throughout the day.

The sound levels were measured at a height of five feet above the ground and at locations where there were no large reflective surfaces to affect the measured levels. The measurements were made under low wind conditions and with dry roadway surfaces, except during the period between approximately 7 a.m. and 8:30 a.m. when fog made Riverside Street slightly wet. Roads were dry after 8:30 a.m. and stayed dry for the remainder of the day. Wind speed measurements were made with a Davis Instruments TurboMeter electronic wind speed indicator, and temperature and humidity measurements were made using a Mannix digital psychrometer. Unofficial observations about meteorology or land use in the community were made solely to characterize the existing sound levels in the area and to estimate the noise sensitivity at properties near the proposed Project.

Wind speeds were measured several times throughout the day at microphone height. Speeds were calm between 6 a.m. and 12 p.m. and ranged between 3 to 6 mph during the rest of the measurement period, consistently coming from the south-southeast. There were gusts of up to 10 mph at some periods during the afternoon. National Weather Service (NWS) observations from the nearby Portland Airport meteorological station were obtained for the 12-hour period and are provided as Appendix C. The wind speeds at the airport ranged between 5 and 17 mph between 3 p.m. and 6 p.m. However, conditions at the Schnitzer site were much less windy, and it is not believed that wind significantly affected the measurement equipment or data.

4.4 Measurement Equipment

A CEL Instruments Model 593.C1 Precision Sound Level Analyzer (serial number 3/0162197) equipped with a CEL-257 Type 1 Preamplifier, a CEL-250 half-inch electret microphone (serial number 6259) and a four-inch foam windscreen were used to collect the short-term broadband and octave band ambient sound pressure level data. The instrumentation meets the "Type 1 - Precision" requirements set forth in American National Standards Institute (ANSI) S1.4-1983 for acoustical measuring devices, as well as IEC Publication 804 (1985). The meter was equipped with an internal octave band filter set along with automatic data logging capabilities conforming to ANSI S1.11-1986. The meter time-weighting was set for the "fast" response (0.125 second) and the data were logged every one second. Octave band levels for this study correspond to the same data set processed for the broadband levels.

The measurement equipment was calibrated in the field before and after the surveys with a Larson Davis CAL200 acoustical calibrator (serial number 2853) which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. The calibration frequency is 1000 Hz with an accuracy of +/- 0.3 dB at the calibration level of 114.0 dB. The calibrator and analyzer are certified as accurate to standards set by the US National Institute of Standards and Technology by an independent laboratory within the past 12 months. Copies of the calibration certificates are included as Appendix D. A calibration check was performed

before and after each measurement program. All calibration level changes were 0.5 dB or less thus validating the data precision.

A Larson Davis model 812 sound level meter (serial number 0632) was used for the continuous monitoring. This meter meets Type 1 ANSI S1.4-1983 standards for sound level meters. The model 812 has been calibrated and certified as accurate to standards set by the National Institute of Standards and Technology by an independent laboratory within the past 12 months. Copies of the calibration certificates are also included in Appendix D. The model 812 has data logging capability and was programmed to log statistical data every minute for the following parameters: L_1, L_{10}, L_{50}, L_{90}, L_{max}, L_{min}, and L_{eq}.

4.5 Baseline Ambient Noise Levels

The existing short-term ambient baseline sound level measurements are summarized below and are presented in detail in Table 2. Detailed sound level data from the continuous measurement program can be found in Table 3 (Location CM1). Figure 3 depicts the hour by hour sound level measurements at Location CM1 for the 12-hour continuous measurement. The continuous sound level data confirm the short-term data as a reasonable representation of area sound levels. The sound level data shown in Figure 3 demonstrates that noise levels were fairly constant throughout the day, most likely due to the steady traffic pattern on Riverside Street. The sound levels at short-term Location 4 (ST4), which was very close to Riverside Street, were considerably higher than those at all the other locations.

not All At PLS

- The short-term daytime L_{eq} (equivalent) measurements ranged from 50 to 72 dBA.
- The 12-hour continuous L_{eq} (equivalent) measurements ranged from 55 to 59 dBA at Location CM1. The arithmetically averaged ambient hourly sound level (L_{eq}) equaled 57 dBA for the entire period (6:00 a.m.–6:00 p.m.). The arithmetically averaged hourly background sound level (L_{90}) equaled 54 dBA for the entire measurement period.

At PL

OK

Table 2: Baseline Ambient Noise Measurements – Proposed Schnitzer Northeast Metal Recycling Facility, Portland, ME

Receptor I.D	Start Time	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)	L_{eq} (dBA)	Octave Bands (Hz) 31.5 L_{eq} (dB)	63 L_{eq} (dB)	125 L_{eq} (dB)	250 L_{eq} (dB)	500 L_{eq} (dB)	1000 L_{eq} (dB)	2000 L_{eq} (dB)	4000 L_{eq} (dB)	8000 L_{eq} (dB)
Loc ST1	10:19 A.M.	52	50	49	50	58	62	56	51	47	48	39	33	26
Loc ST2	10:52 A.M.	51	49	47	51	57	59	54	50	50	47	39	37	32
Loc ST3	11:36 A.M.	56	53	51	53	60	61	56	50	51	51	43	35	29
Loc ST4	1:40 P.M.	76	69	60	72	67	73	71	69	68	69	64	57	52

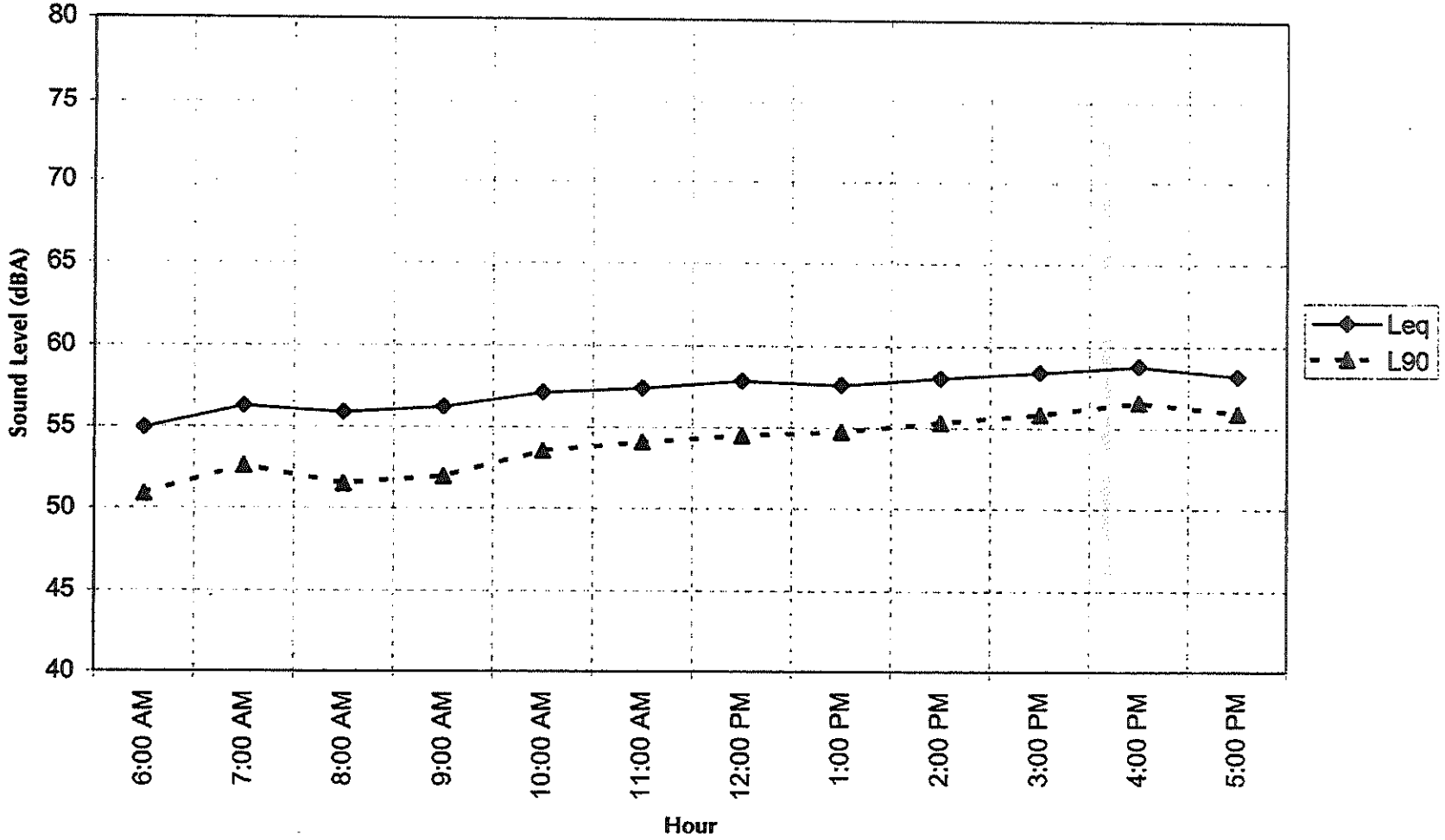
Notes:

1. Weather: Temperature = 68°F, RH = 80%, skies cloudy, winds from the south southeast at 0-10 mph.
2. Road surfaces were dry during all short-term measurements.
3. All sampling periods were approximately 30 minutes duration.
4. Measurements were collected on July 11, 2007

Table 3: Location CM1 Continuous 12-Hour Sound Measurement Data

Hour	L_{eq} 1 Hr (dBA)	L_{90} (dBA)
6:00	55	51
7:00	56	53
8:00	56	52
9:00	56	52
10:00	57	54
11:00	57	54
12:00	58	54
13:00	58	55
14:00	58	55
15:00	58	56
16:00	59	57
17:00	58	56

Figure 3: Hourly Sound Level Measurements at Location CM1
July 11, 2007



5.0 REFERENCE SOUND LEVEL DATA

The key potential sources of operational noise at the proposed facility will be heavy equipment such as excavators and loaders. Reference sound level data for operation of such equipment was collected by Epsilon Associates in 2005 at an existing metal recycling facility. That data were used to estimate impacts at the nearest lot boundaries and residences for the proposed Riverside Street facility. Although these sound sources will operate intermittently and at different times, a worst-case assumption was used where all equipment would operate continuously and simultaneously. Reference sound level data for all equipment were measured at 50 feet and are summarized below in Table 4.

Table 4: Measured Equipment Sound Levels (at 50 feet)

Equipment	L_{eq} (dBA)	Octave Bands (Hz)								
		31.5 L_{eq} (dB)	63 L_{eq} (dB)	125 L_{eq} (dB)	250 L_{eq} (dB)	500 L_{eq} (dB)	1000 L_{eq} (dB)	2000 L_{eq} (dB)	4000 L_{eq} (dB)	8000 L_{eq} (dB)
Komatsu Excavator Model PC300LC5	79	80	79	80	74	74	75	72	68	59
John Deere Loader Model 624H	69	66	75	76	69	67	64	60	52	43
Sierra 4200 Baler	77	75	78	71	67	73	73	70	65	62
Dump Truck Back-up Alarm	77	83	83	73	67	67	68	74	70	58

The CadnaA (Computer Aided Noise Abatement) model calculates sound levels based on the sound power levels of the sources. The sound power output of a source is the total amount of energy radiated into the atmosphere, designated in units of Watts. Sound power data for this equipment was not available, so approximate sound power levels were calculated using the measured sound levels listed above. The following equation was used to approximate the sound power level of the equipment, assuming hemi-spherical spreading over hard ground:

$$L_w = L_p + 20\text{Log}_{10}(r) + 8$$

where:

L_w = approximate sound power level
L_p = measured sound pressure level at 50 feet (15.24 meters)
r = distance from measurement microphone to acoustical center of source
8 dB = increase in sound level, accounting for decrease in distance

The resulting approximate octave-band sound power levels used in the CadnaA model are listed below in Table 5.

Table 5: Approximate Equipment Sound Power Levels

Equipment	L_{eq} (dBA)	Octave Bands (Hz)								
		31.5 L_{eq} (dB)	63 L_{eq} (dB)	125 L_{eq} (dB)	250 L_{eq} (dB)	500 L_{eq} (dB)	1000 L_{eq} (dB)	2000 L_{eq} (dB)	4000 L_{eq} (dB)	8000 L_{eq} (dB)
Komatsu Excavator Model PC300LC5	111	112	111	112	106	106	106	103	100	91
John Deere Loader Model 624H	97	94	103	104	97	95	92	88	80	71
Sierra 4200 Baler	109	107	110	103	99	104	105	102	97	93
Dump Truck Back-up Alarm	109	115	114	105	98	99	99	105	101	90

? Actual Sound Right next to the equipment

6.0 FUTURE CONDITIONS

Predictive sound level modeling was done at the nearest lot lines to the facility's noise-producing activities as required by the City regulation. The evaluation points are listed below. All evaluation points were modeled at a height of five feet above the ground.

- Nearest the extreme northeast corner of the property line, bordering both Lucas Tree and Riverside St ("Point A")
- Nearest the westernmost property line, bordering the area closest the Presumpscot River ("Point B")
- Nearest the southwest lot line ("Point C")
- Nearest lot line to both Riverside St and the existing house ("Point D")
- Approaching the nearest residential zoning area (R5), close to Waldron Way ("Point E")
- Along Riverside Street, near the entrance to the facility ("Point F")

If sound levels are acceptable (70 dBA or below) at these evaluation points, then noise from the site at other more distant lot line locations will be even less, as sound decreases with distance from the source. Figure 4 shows the site layout plan for the Schnitzer facility, the primary sound sources, and the modeled points of evaluation.

Gridded receptors spaced approximately every 15 feet (and at a height of 5 feet above the ground) were analyzed as well as the discrete points listed above. Contours were developed at 1 dBA increments over the receptor grid. These contours were then reviewed to determine compliance at the locations of interest.

6.1 CadnaA Computer Software Sound Model

The sound modeling was conducted using the CadnaA sound calculation model (DataKustik Corporation, 2005). This physics-based computer software model uses the ISO 9613-2 industrial standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The CadnaA model allows for octave band calculation of noise from multiple sources, as well as computation of diffraction around building edges, and multiple reflections off parallel buildings and solid ground areas. In this manner, all significant noise sources and geometric propagation effects are accounted for in the noise modeling. For the distances involved in this modeling, flat terrain was assumed. Based on the site visit to the area, this is a reasonable assumption (see earlier note regarding site elevations). Shielding credit from onsite structures was taken in the modeling where appropriate.

2 sided

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Envelope Compliance Certificate

2003 IECC

Section 1: Project Information

Project Type: New Construction
Project Title : Schnitzer Northeast

Construction Site:
568 Riverside Street
Portland, Maine

Owner/Agent:
Prolerized New England Comapny, LLC
69 Rover St
Everett, Massachusetts 02149
781-873-1662

Designer/Contractor:
Dennis Waters
Patco Construction
1293 Main Street
Sanford, Maine 04073
207-324-5574 x24
dwaters@patco.com

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Dept. of Building Inspections
City of Portland Maine

Section 2: General Information

Building Location (for weather data):	Portland, Maine
Climate Zone:	15
Heating Degree Days (base 65 degrees F):	7378
Cooling Degree Days (base 65 degrees F):	268
Vertical Glazing / Wall Area Pct.:	2%

Activity Type(s)	Floor Area
Other	8700
Office	3600

Section 3: Requirements Checklist

Envelope PASSES: Design 0% better than code

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor(a)
Roof: Metal, without Thermal Blocks	12042	19.0	0.0	0.101	0.053
Ext. Wall: Metal Wall w/o Thermal Blocks	14725	13.0	0.0	0.123	0.075
Window: Vinyl Frame, 2 Pane w/ Low-E, Clear, SHGC 0.29	288	---	---	0.330	0.526
Door: Solid	243	---	---	0.140	0.122
Floor: Unheated Slab-On-Grade, Vertical 4 ft.	12000	---	7.0	---	---

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

- ☐ 1. All joints and penetrations are caulked, gasketed or covered with a moisture vapor-permeable wrapping material installed in accordance with the manufacturer's installation instructions.
- ☐ 2. Windows, doors, and skylights certified as meeting leakage requirements.
- ☐ 3. Component R-values & U-factors labeled as certified.
- ☐ 4. Insulation installed according to manufacturer's instructions, in substantial contact with the surface being insulated, and in a manner that achieves the rated R-value without compressing the insulation.
- ☐ 5. Stair, elevator shaft vents, and other dampers integral to the building envelope are equipped with motorized dampers.
- ☐ 6. Cargo doors and loading dock doors are weather sealed.
- ☐ 7. Recessed lighting fixtures are: (i) Type IC rated and sealed or gasketed; or (ii) installed inside an appropriate air-tight assembly with a 0.5 inch clearance from combustible materials and with 3 inches clearance from insulation material.

☐ 8. Building entrance doors have a vestibule equipped with closing devices.
Exceptions:

Building entrances with revolving doors.

Doors that open directly from a space less than 3000 sq. ft. in area.

☐ 9. Vapor retarder installed.

Section 4: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2003 IECC requirements in COM*check-Web* and to comply with the mandatory requirements in the Requirements Checklist.

Dennis Waters, Vice Pres.	Dennis M. L	6/3/10
Name - Title	Signature	Date

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Interior Lighting Compliance Certificate

2003 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title : Schnitzer Northeast

Construction Site:
568 Riverside Street
Portland, Maine

Owner/Agent:
Prolerized New England Comapny, LLC
69 Rover St
Everett, Massachusetts 02149
781-873-1662

Designer/Contractor:
Dennis Waters
Patco Construction
1293 Main Street
Sanford, Maine 04073
207-324-5574 x24
dwaters@patco.com

Section 2: General Information

Building Use Description by: **Activity Type**

Activity Type(s)	Floor Area
Other	8700
Office	3600

Section 3: Requirements Checklist

Interior Lighting:

☐ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
12660	1608	YES

☐ 2. Exit signs 5 Watts or less per sign.

Exterior Lighting:

☐ 3. Efficacy greater than 45 lumens/W.
Exceptions:

Specialized lighting highlighting features of historic buildings; signage; safety or security lighting; low-voltage landscape lighting.

Controls, Switching, and Wiring:

☐ 4. Independent controls for each space (switch/occupancy sensor).
Exceptions:

Areas designated as security or emergency areas that must be continuously illuminated.

Lighting in stairways or corridors that are elements of the means of egress.

☐ 5. Master switch at entry to hotel/motel guest room.

☐ 6. Individual dwelling units separately metered.

☐ 7. Each space provided with a manual control to provide uniform light reduction by at least 50%.
Exceptions:

Only one luminaire in space;

An occupant-sensing device controls the area;

The area is a corridor, storeroom, restroom, public lobby or guest room;

Areas that use less than 0.6 Watts/sq.ft.

☐ 8. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.

Exceptions:

Areas with only one luminaire, corridors, storerooms, restrooms, or public lobbies.

☐ 9. Photocell/astronomical time switch on exterior lights.
Exceptions:

Lighting intended for 24 hour use.

☐ 10. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).
Exceptions:

Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 4: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2003 IECC, Chapter 8, requirements in COM*check-Web* and to comply with the mandatory requirements in the Requirements Checklist.

Dean M. L Vice Pres.	Dennis Waters	6/3/10
Name - Title	Signature	Date

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Interior Lighting Application Worksheet

2003 IECC

Section 1: Allowed Lighting Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Other	8700	1	8700
Office	3600	1.1	3960
		Total Allowed Watts =	12660

Section 2: Proposed Lighting Power Calculation

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Other (8700 sq.ft.)				
Compact Fluorescent: Other / Electronic	6	12	54	648
Office (3600 sq.ft.)				
Compact Fluorescent: Other / Electronic	3	30	32	960
			Total Proposed Watts =	1608

Section 3: Compliance Calculation

If the Total Allowed Watts minus the Total Proposed Watts is greater than or equal to zero, the building complies.

Total Allowed Watts = 12660
Total Proposed Watts = 1608
Project Compliance = 11052

Interior Lighting PASSES: Design 87% better than code

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Mechanical Compliance Certificate

2003 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title : Schnitzer Northeast

Construction Site:
568 Riverside Street
Portland, Maine

Owner/Agent:
Prolerized New England Comapny, LLC
69 Rover St
Everett, Massachusetts 02149
781-873-1662

Designer/Contractor:
Dennis Waters
Patco Construction
1293 Main Street
Sanford, Maine 04073
207-324-5574 x24
dwaters@patco.com

Section 2: General Information

Building Location (for weather data):	**Portland, Maine**
Climate Zone:	**15**
Heating Degree Days (base 65 degrees F):	**7378**
Cooling Degree Days (base 65 degrees F):	**268**

Section 3: Mechanical Systems List

Quantity	System Type & Description
1	HVAC: Heating: Unit Heater, Gas, Capacity 125000 kBtu/h, Efficiency: 80.00 / Cooling: Split System, Capacity 80000 kBtu/h, Efficiency: 9.00 , Air-Cooled Condenser
1	Water Heating: Service Water Heater, Efficiency: 0.62

Section 4: Requirements Checklist

Requirements Specific To: HVAC :

- ☐ 1. Equipment minimum efficiency: Unit Heater (Gas): 80.0 % Ec
- ☐ 2. Minimum one temperature control device per zone
- ☐ 3. Equipment minimum efficiency: Split System: 9.0 EER (9.2 IPLV)
- ☐ 4. Systems serving more than one zone must be VAV systems
  - Exception: Where pressure relationships must be maintained
  - Exception: Zones or supply air systems with at least 75% of reheating/recooling energy site recovered or site solar
  - Exception: Zones with humidity requirements for special processes
  - Exception: Zones with cfm <300 and flow rate <10% of total design flow rate
  - Exception: Outside air needed to meet IMC Chapter 4

Requirements Specific To: Water Heating :

- ☐ 1. Heat traps in inlet/outlet fittings
- ☐ 2. 1/2-In. insulation on 8 ft of inlet/outlet piping if no integral heat traps
- ☐ 3. Gas Instantaneous Water Heater efficiency: 0.6 EF

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- ☐ 1. Load calculations per ASHRAE Fundamentals
- ☐ 2. Plant equipment and system capacity no greater than needed to meet loads
  - Exception: Standby equipment automatically off when primary system is operating

- Exception: Multiple units controlled to sequence operation as a function of load

☐ 3. Minimum one temperature control device per system

☐ 4. Minimum one humidity control device per installed humidification/dehumidification system

☐ 5. Automatic Controls: Setback to 55 degrees F (heat) and 85 degrees F (cool); 7-day clock, 2-hour occupant override, 10-hour backup

- Exception: Continuously operating zones
- Exception: 2 kW demand or less, submit calculations

☐ 6. Automatic shut-off dampers on exhaust systems and supply systems with airflow >3,000 cfm

☐ 7. Outside-air source for ventilation; system capable of reducing OSA to required minimum

☐ 8. R-5 supply and return air duct insulation in unconditioned spaces R-8 supply and return air duct insulation outside the building R-8 insulation between ducts and the building exterior when ducts are part of a building assembly

- Exception: Ducts located within equipment
- Exception: Ducts with interior and exterior temperature difference not exceeding 15 degrees F.

☐ 9. Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics

- Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification

☐ 10. Mechanical fasteners and sealants used to connect ducts and air distribution equipment

☐ 11. Hot water pipe insulation: 1 in. for pipes <=1.5 in. and 2 in. for pipes >1.5 in. Chilled water/refrigerant/brine pipe insulation: 1 in. for pipes <=1.5 in. and 1.5 in. for pipes >1.5 in. Steam pipe insulation: 1.5 in. for pipes <=1.5 in. and 3 in. for pipes >1.5 in.

- Exception: Piping within HVAC equipment.
- Exception: Fluid temperatures between 55 and 105 degrees F.
- Exception: Fluid not heated or cooled with renewable energy.
- Exception: Runouts <4 ft in length.

☐ 12. Operation and maintenance manual provided to building owner

☐ 13. Balancing devices provided in accordance with IMC 603.15

☐ 14. Newly purchased service water heating equipment meets the efficiency requirements

☐ 15. Water heater temperature controls: 110 degrees F for dwelling units or 90 degrees F for other occupancies

☐ 16. Thermostatic controls have 5 degrees F deadband

- Exception: Thermostats requiring manual changeover between heating and cooling
- Exception: Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.

☐ 17. Stair and elevator shaft vents are equipped with motorized dampers

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2003 IECC requirements in COM*check-Web* and to comply with the mandatory requirements in the Requirements Checklist.

Dennis Waters, Vice Pres. — Name - Title

Dennis M. L — Signature

6/3/10 — Date

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Mechanical Requirements Description

2003 IECC

The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: HVAC :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1 Code and must meet the following minimum efficiency: Unit Heater (Gas): 80.0 % Ec
2. Each zone of a multiple-zone system must have its own temperature control device.
3. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Split System: 9.0 EER (9.2 IPLV)
4. Systems serving multiple thermostatic control zones must be variable-flow systems. Zone terminal controls must reduce the flow of primary supply air before reheating, recooling, or mixing air streams to one of the following: a) 30% of the maximum supply air to each zone, b) 300 cfm or less where the maximum flow rate is less than 10% of the total fan system supply airflow rate, or c) minimum ventilation requirements of Chapter 4 of the International Mechanical Code.
   - Exception: VAV controls are not required for zones with special pressurization or cross-contamination requirements. These zones must be called out in the construction documents for easy identification during field inspection.
   - Exception: VAV controls are not required for zones or supply air systems where at least 75% of the reheating and recooling energy is made available through the use of site-recovered or site solar energy. These zones must be called out in the construction documents for easy identification during field inspection.
   - Exception: VAV controls are not required for zones with special humidity control requirements for specialized processes. These zones must be called out in the construction documents for easy identification during field inspection.
   - Exception: VAV controls are not required for zones that require less than 300 cfm of supply air provided the total airflow to these zones does not exceed 10% of the total design flow rate for the system.
   - Exception: VAV controls are not required where constant volume supply air is necessary to meet the minimum outside air requirements of Chapter 4 of the International Mechanical Code. These zones must be called out in the construction documents for easy identification during field inspection.

Requirements Specific To: Water Heating :

1. Heat traps are required on noncirculating water heating systems on both inlet and outlet connections. Heat traps may be purchased or field-fabricated by creating a loop or inverted U-shaped arrangement on the inlet and outlet pipes.
2. Pipe insulation for the specified noncirculating service hot water system is required for all piping in the following categories: a) the first 8 ft of outlet piping from any constant-temperature, noncirculating storage system b) the inlet piping between the storage tank and a heat trap in a noncirculating storage system Pipe insulation must be at least 1/2 in. and have a conductivity no >0.28 Btu-in/(h-ft2-degrees F).
3. Service water heating equipment used solely for heating potable water, pool heaters, and hot water storage tanks must meet the following minimum efficiency: Gas Instantaneous Water Heater efficiency: 0.6 EF

Generic Requirements: Must be met by all systems to which the requirement is applicable:

1. Design heating and cooling loads for the building must be determined using procedures in the ASHRAE Handbook of Fundamentals or an approved equivalent calculation procedure.
2. All equipment and systems must be sized to be no greater than needed to meet calculated loads. A single piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.
   - Exception: The equipment and/or system capacity may be greater than calculated loads for standby purposes. Standby equipment must be automatically controlled to be off when the primary equipment and/or system is operating.
   - Exception: Multiple units of the same equipment type whose combined capacities exceed the calculated load are allowed if they are provided with controls to sequence operation of the units as the load increases or decreases.
3. Each heating or cooling system serving a single zone must have its own temperature control device.
4. Each humidification system must have its own humidity control device.
5. The system or zone control must be a programmable thermostat or other automatic control meeting the following criteria: a) capable of setting back temperature to 55 degrees F during heating and setting up to 85 degrees F during cooling, b) capable of automatically setting back or shutting down systems during unoccupied hours using 7 different day schedules, c) have an accessible 2-hour occupant override, d) have a battery back-up capable of maintaining programmed settings for at least 10 hours without power.

- Exception: A setback or shutoff control is not required on thermostats that control systems serving areas that operate continuously.
- Exception: A setback or shutoff control is not required on systems with total energy demand of 2 kW (6,826 Btu/h) or less.

6. Outdoor-air supply systems with design airflow rates >3,000 cfm of outdoor air and all exhaust systems must have dampers that are automatically closed while the equipment is not operating.
7. The system must supply outside ventilation air as required by Chapter 4 of the International Mechanical Code. If the ventilation system is designed to supply outdoor-air quantities exceeding minimum required levels, the system must be capable of reducing outdoor-air flow to the minimum required levels.
8. Air ducts must be insulated to the following levels: a) Supply and return air ducts for conditioned air located in unconditioned spaces (spaces neither heated nor cooled) must be insulated with a minimum of R-5. Unconditioned spaces include attics, crawl spaces, unheated basements, and unheated garages. b) Supply and return air ducts and plenums must be insulated to a minimum of R-8 when located outside the building. c) When ducts are located within exterior components (e.g., floors or roofs), minimum R-8 insulation is required only between the duct and the building exterior.
   - Exception: Duct insulation is not required on ducts located within equipment.
   - Exception: Duct insulation is not required when the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15 degrees F.
9. All joints, longitudinal and transverse seams, and connections in ductwork must be securely sealed using weldments; mechanical fasteners with seals, gaskets, or mastics; mesh and mastic sealing systems; or tapes. Tapes and mastics must be listed and labeled in accordance with UL 181A or UL 181B.
   - Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification.
10. Mechanical fasteners and seals, mastics, or gaskets must be used when connecting ducts to fans and other air distribution equipment, including multiple-zone terminal units.
11. All pipes serving space-conditioning systems must be insulated as follows: Hot water piping for heating systems: 1 in. for pipes <=1 1/2-in. nominal diameter, 2 in. for pipes >1 1/2-in. nominal diameter. Chilled water, refrigerant, and brine piping systems: 1 in. insulation for pipes <=1 1/2-in. nominal diameter, 1 1/2 in. insulation for pipes >1 1/2-in. nominal diameter. Steam piping: 1 1/2 in. insulation for pipes <=1 1/2-in. nominal diameter, 3 in. insulation for pipes >1 1/2-in. nominal diameter.
   - Exception: Pipe insulation is not required for factory-installed piping within HVAC equipment.
   - Exception: Pipe insulation is not required for piping that conveys fluids having a design operating temperature range between 55 degrees F and 105 degrees F.
   - Exception: Pipe insulation is not required for piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
   - Exception: Pipe insulation is not required for runout piping not exceeding 4 ft in length and 1 in. in diameter between the control valve and HVAC coil.
12. Operation and maintenance documentation must be provided to the owner that includes at least the following information: a) equipment capacity (input and output) and required maintenance actions b) equipment operation and maintenance manuals c) HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions; desired or field-determined set points must be permanently recorded on control drawings, at control devices, or, for digital control systems, in programming comments d) complete narrative of how each system is intended to operate.
13. Each supply air outlet or diffuser and each zone terminal device (such as VAV or mixing box) must have its own balancing device. Acceptable balancing devices include adjustable dampers located within the ductwork, terminal devices, and supply air diffusers.
14. Service water heating equipment must meet minimum Federal efficiency requirements included in the National Appliance Energy Conservation Act and the Energy Policy Act of 1992, which meet or exceed ASHRAE 90.1 Code. New service water heating equipment can be assumed to meet these requirements.
15. Water-heating equipment must be provided with controls that allow the user to set the water temperature to 110 degrees F for dwelling units and 90 degrees F for other occupancies. Controls must limit output temperatures of lavatories in public facility restrooms to 110 degrees F.
16. Thermostats controlling both heating and cooling must be capable of maintaining a 5 degrees F deadband (a range of temperature where no heating or cooling is provided).
   - Exception: Deadband capability is not required if the thermostat does not have automatic changeover capability between heating and cooling.
   - Exception: Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.
17. Stair and elevator shaft vents must be equipped with motorized dampers capable of being automatically closed during normal building operation and interlocked to open as required by fire and smoke detection systems. All gravity outdoor air supply and exhaust hoods, vents, and ventilators must be equipped with motorized dampers that will automatically shut when the spaces served are not in use.
   - Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.
   - Exception: Ventilation systems serving unconditioned spaces.

Noise Impact Assessment Study

Prolerized New England Company, LLC
d/b/a Schnitzer Northeast Metal Recycling Facility
Portland, ME

Riverside Street
Portland, ME

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October 15, 2007

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1.0 INTRODUCTION AND SUMMARY

An analysis of potential community noise impacts associated with the proposed Schnitzer Northeast metal recycling facility has been conducted. This analysis has been prepared to address the requirements of the Maine DEP noise regulations from Chapter 400 of the Maine DEP solid waste rules, because the proposed metal recycling facility is regulated as a processing facility under the Maine solid waste act and associated regulations, 38 M.R.S.A. § 3001 et seq. The facility is exempt from review under the Site Location of Development Act, 38 M.R.S.A. § 481 et seq., ("Site Law") and its associated regulations, including Chapter 375. See, 38 M.R.S.A. § 488(21) (stating that facilities regulated by the Maine DEP under 38 M.R.S.A. § 1310-N are exempt from review under the Site Law). The analysis also addresses the City of Portland Code of Ordinances, Chapter 14 "Land Use," section 14-267.

In this report, we discuss the potential noise levels in the surrounding community due to operation of recycling facility equipment. A sound level measurement program was conducted at potentially sensitive locations around the proposed site. The goal was to determine existing background sound levels during daytime hours. The existing levels were then compared with computer-modeled future sound levels due to the operation of equipment. The modeling results were compared with both existing conditions and regulatory standards. Community noise attributable to the recycling facility may arise from three primary sources.

- Excavators used to move materials
- Loader waste handlers for clearing and moving materials
- Back-up alarms from trucks on the site

The equipment expected to be used at the facility will operate at noise levels well within the City of Portland and Maine DEP noise regulations, and without substantial impact to the surrounding ambient noise environment.

A summary of recommended noise reduction measures is included in the last section of this report.

2.0 NOISE METRICS

There are several metrics with which sound (noise) levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The following information defines the noise measurement terminology used in this analysis.

The decibel scale is logarithmic, to accommodate the wide range of sound intensities found in the environment. A property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a 3-decibel increase (to 53 dB), not a doubling to 100 dB. Thus, every 3 dB change in sound levels represents a doubling/halving of sound energy. Related to this is the fact that a change in sound levels of less than 3 dB is imperceptible to the human ear.

Another property of decibels is that if one source of noise is 10 dB (or more) louder than another source, then the total sound level is simply the sound level of the higher source. For example, a source of sound at 60 dB plus another source of sound at 47 dB is 60 dB.

Sound level meters used to measure noise are standardized instruments. They contain "weighting networks" to adjust the frequency response of the instrument to approximate that of the human ear under various circumstances. The network used for community noise surveys is the A-weighting network. Sounds detected with the A-weighting network of the sound level meter are reported in decibels designated as "dBA." The A-weighted scale (dBA) most closely approximates how the human ear responds to sound at various frequencies: it emphasizes the middle frequency (i.e., middle pitched - around 1,000 Hertz - sounds), and de-emphasizes lower and higher frequency sounds. Figure 1 presents an example of some common indoor and outdoor activities, and their typical sound levels in our environment.

Because the sounds in the environment vary with time, they cannot simply be described with a single number. Two methods are used for describing variable sounds: the percentile exceedance levels (Ln) and the equivalent level (Leq). Both are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated Ln, where n can have a value of 0 to 100 percent. Some common metrics reported in community noise monitoring studies are described below.

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.

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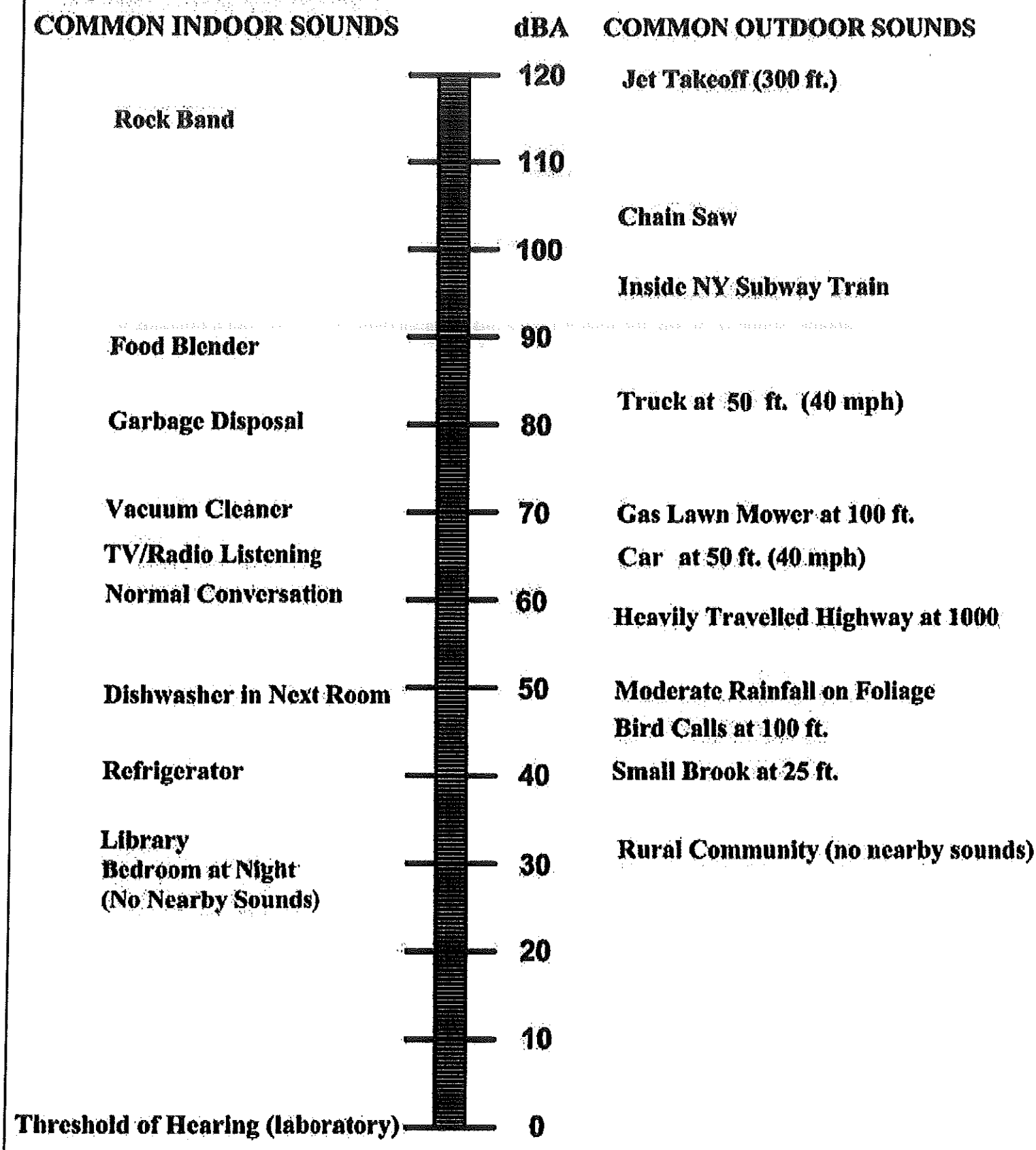


Figure 1
Typical Sound Levels from Our Environment

- L_{50} is the median sound level, which is the sound level in dBA exceeded 50 percent of the time during the measurement period.

- L_{10} is the sound level in dBA exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles.

- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq}; and is also A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is most often determined by occasional loud, intrusive noises.

- The maximum sound level during a given time is designated as the L_{max}. The L_{max} are typically due to discrete, identifiable events such as an airplane overflight, car or truck passby, or a dog barking for example.

By using various noise metrics it is possible to separate prevailing, steady sounds (the L90) from occasional, louder sounds (L10 or Lmax) in the noise environment.

The spectra of noises are also stated in terms of octave band sound pressure levels, in dB, with the octave frequency bands being those established by standard. If noise control treatments are required for a source, it is essential to know something about the frequency spectrum of the noise of interest. Noise control treatments do not function like the human ear, so simple A-weighted levels are not useful for noise-control design. In the event that noise-control is necessary for this project, the estimates of noise levels due to equipment operation are also presented in terms of octave band sound pressure levels.

3.0 RELEVANT NOISE REGULATIONS AND CRITERIA

Noise is officially defined as "unwanted sound". The principal feature of this definition is that there must be sound energy and someone hearing it who considers it unwanted. Noise impact is judged on two bases: the extent to which governmental regulations or guidelines may be exceeded, and the extent to which it is estimated that people may be annoyed or otherwise adversely affected by the sound. Specific regulatory references are as follows.

3.1 Maine State Regulations

Maine regulates noise from solid waste facilities under Chapter 400, section F, "No Adverse Environmental Effect on Existing Uses and Scenic Character." The hourly equivalent sound level (L_{eq1Hr}) is limited to 75 dBA at the property line except for "protected" locations (residential or noise sensitive land use). For these "protected locations", hourly equivalent sound limits are as follows based on zoning. Daytime is defined as 7:00 a.m. to 7:00 p.m. while nighttime is defined as the remaining hours.

Commercial, Industrial	70 dBA (day)/60 dBA (night)
Residential, Other	60 dBA (day)/50 dBA (night)

Additional regulations apply to construction noise. The noise from trucks is exempt while operating on public ways, when they enter the facility to make a delivery or pickup, and when they are moving, starting, or stopping, but not when they are parked for over 60 minutes in the facility (Chapter 400, section F(2)(e)). Sound from warning signals and alarms are also exempt from the noise regulation. A copy of the noise rules from Chapter 400 is included as Appendix A.

3.2 Local Regulations

The City of Portland does have a quantifiable noise standard as part of the Code of Ordinances (Chapter 14, "Land Use"). Noise standards are based on the zoning of the site under consideration. The entire Riverside Street site is zoned as high-impact industrial (IH), and it is immediately bordered by a moderate-impact industrial zone (IM). Within the IH zone, the maximum permissible sound level shall not exceed 75 dBA at the property line between 7:00 a.m. and 10:00 p.m. (The IM zone maximum level is 70 dBA.) It is understood that this recycling facility will only operate during daytime hours (no earlier than 7:00 a.m.).

The City of Portland has clarified their noise regulation to mean that city noise regulations do not apply to trucks that are licensed and inspected by the State of Maine while they are moving (including while traveling within a site). However, once vehicles are parked, the City of Portland noise regulations apply to activities such as unloading the contents of the trucks.

A copy of the relevant sections of the local noise regulation is included as Appendix B.

3.3 Comparison of State and Local Noise Regulations

Table 1 presents a comparison of the City of Portland and ME DEP noise regulations. The adjoining properties along Riverside Street are zoned for moderate-impact industrial use, so the 70 dBA standard should apply at the property lines of the proposed facility. If property-line noise levels due to facility operations stay below 70 dBA, no noise mitigation will be necessary.

Table 1: Comparison of Zoning District Noise Standards – City of Portland and ME DEP

Zoning District -- Receiver	City of Portland		ME DEP "Protected Locations"	
	Time Period	Maximum Property-Line Sound Level	Time Period	Maximum Sound Level
Residential	All Times	55 dBA (R-P Zones)	7 am – 7 pm	60 dBA
Commercial	7 am – 9 pm	65 dBA (B-4 Zone)	7 am – 7 pm	70 dBA
	7 am – 10 pm	60 dBA (B-5 Zone)		
Industrial	7 am – 10 pm	70 dBA (Moderate-Impact Zone)	7 am – 7 pm	70 dBA
	7 am – 10 pm	75 dBA (High-Impact Zone)		

The City of Portland does not regulate tonal sounds while the ME DEP does (ME DEP Solid Waste Management Rules, Chapter 400, section 4(F)(2)).

4.0 EXISTING CONDITIONS

The proposed recycling facility will be located on a parcel of land bordered by Riverside Street to the east and businesses zoned for moderate-impact industrial use to the north and south. To the west, the parcel is bordered by land near the Presumpscot River. The City of Westbrook lies beyond the river. Figure 2 is an aerial photograph of the area showing noise measurement locations and an overlay of the proposed site footprint. Note the dashed blue line depicted near the western and southwestern property line. The line represents an elevation drop of approximately 25 to 30 feet and demarcates the portion of the site that consists of flat, level terrain on which equipment can be used.

The uneven terrain, especially the sudden drop in elevation beyond the dash blue line, would affect sound levels measured at the far western and southern property lines. Those areas, which are shielded from vehicle noise on Riverside Drive, do not represent typical noise conditions for this site. For that reason, sound levels were measured along the edge of the flat, level area, as close to the property lines as possible. The section describing noise measurement locations provides further details.

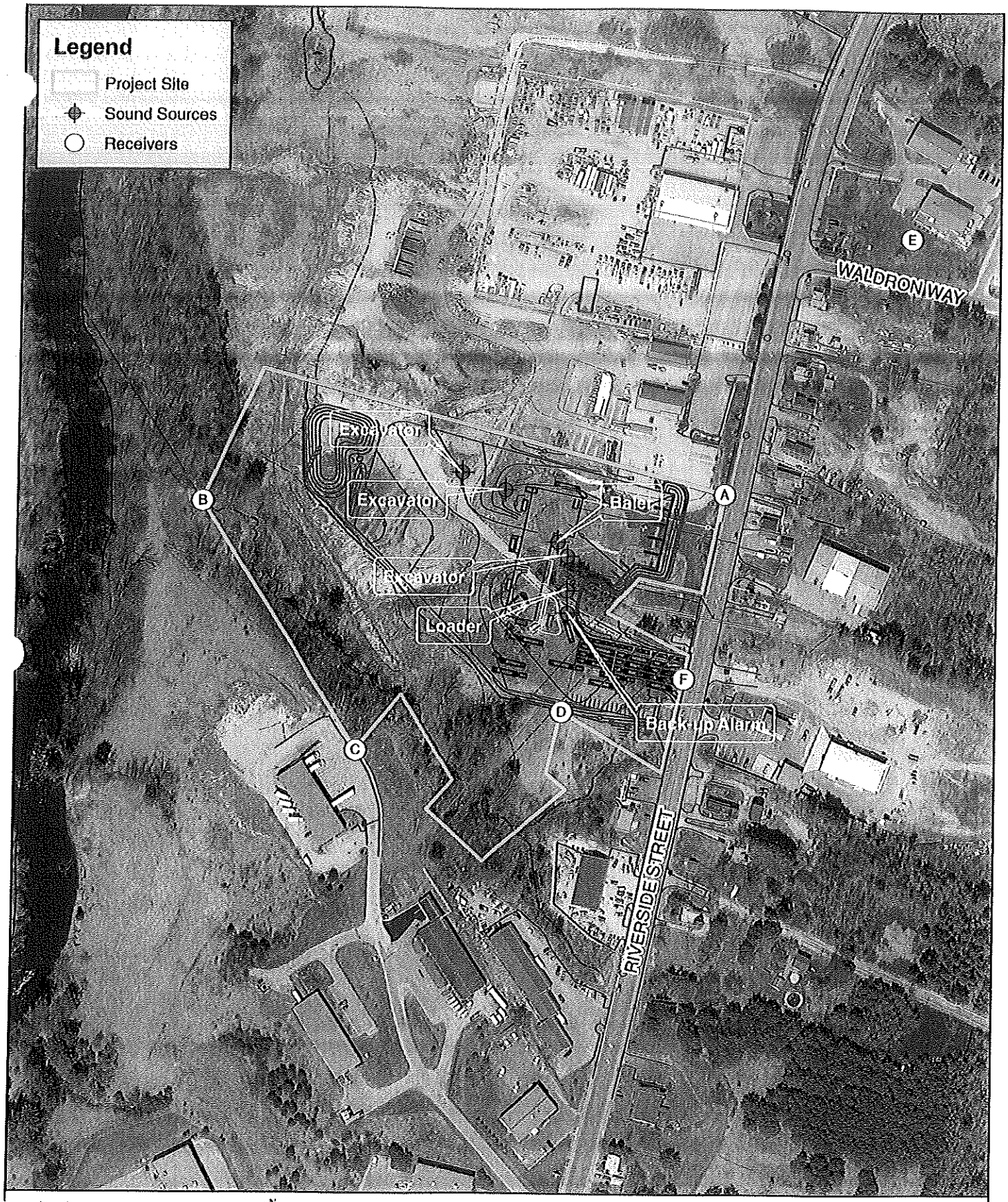
4.1 Baseline Noise Environment

An ambient noise level survey was conducted during the daytime hours to characterize the existing "baseline" acoustical environment in the vicinity of the site. Existing noise sources in the vicinity include: car, bus, and truck traffic on Riverside Street; distant traffic on I-95; branches and leaves rustling in the wind; airplane overflights; birds; and occasional activity (pick-up trucks) at the Lucas Tree facility along the northern border of the proposed site.

Broadband (A-weighted) sound level measurements were conducted for 12 consecutive hours at one (1) location from 6:00 a.m. to 6:00 p.m. on Wednesday, July 11, 2007. This continuous data were used to identify current patterns in the overall sound level throughout the day. Short-term (30-minute) octave-band measurements were made at four (4) other site locations throughout the day, to obtain a sampling of the ambient baseline noise environment. The microphones were located at a height of approximately five feet above the ground, at all locations.

4.2 Noise Measurement Locations

The selection of both the continuous and short-term sound monitoring locations was based upon a review of the current land use in the area and discussions with Civil Consultants. The four short-term noise-monitoring locations were selected in representative directions around the site. The sensitive receptors chosen for this study include the nearest residential



Scale 1:3,000
1 inch = 250 feet

125 0 125 250
Feet

Figure 4
Sound Level Modeling Locations

Schnitzer Recycling
Portland, Maine

Basemap: 2001, Orthophotography, ME GIS

Epsilon Associates Inc.

G:\Projects2\ME\Portland\2197\noise_modeling.mxd

7/30/07

The model was run with standard meteorological conditions of 20 degrees C (68 degrees F), 50% relative humidity, and no wind. To be conservative, no ground attenuation credit was taken by the model. The maximum order of reflections was set to three in Cadna/A. The reflection type of the building wall was modeled as a smooth façade/reflective barrier. That calculates a loss of 1 dB for sound reflecting off of the building.

6.2 Sound Source and Sound Receiver Locations in CadnaA Model

Due to the close proximity of the Lucas Tree property, a few comments regarding the specific details of the CadnaA noise model are in order. The actual locations of the excavators, relative to the northern property line (Lucas Tree), shall determine whether the facility will operate at noise levels well within the City of Portland (and Maine DEP) noise regulations. To stay within the more conservative 70 dBA goal (Portland Moderate-Impact Industrial Zone), the loudest sound sources (the excavators) were modeled no closer than 85 feet from the Lucas Tree property boundary. That corresponds approximately to the distance from the edge of the materials sorting building to the northern property boundary.

The baler will operate inside the section of the sorting building closest to the northern property line. However, to be conservative (resulting in sound levels much louder than will actually be the case), the baler sound source within CadnaA was situated just outside the front of the building section in which the baler will be housed. Two excavators were placed behind the building, within an area where most of the recyclable materials will be sorted. A front loader, another excavator (which is also highly unlikely), and a truck back-up alarm were modeled in front of the building. These are all conservative assumptions, since more activity will probably occur behind the building than in front. These assumptions ensure a worst-case scenario for sound levels along the northern (Lucas Tree) and eastern (Riverside Street) property lines. Given the dimensions of this large equipment, all of the sources were modeled with their "acoustical centers" at approximately 10 feet above the ground.

6.3 Predicted Sound Level Results

The model output is shown in Appendix E, produced directly from Cadna/A with the results at the discrete receptors. The sound level results at the evaluation points are shown in Table 6. All equipment operation will meet the ME DEP and City of Portland daytime noise regulations, provided that excavator activity behind the building occurs at least 85 feet away from any property line (the Lucas Tree property line in particular).

Table 6: Predicted Noise Levels Due to Equipment Operation – (dBA)

Location	Calculated Project	ME DEP Criteria (Day)	City of Portland Criteria (Day)
Northeast Corner: "Point A"	61	70	70
Far West Corner: "Point B"	56	70	70
Southwest Corner: "Point C"	56	70	70
South/Riverside Corner: "Point D"	66	70	70
R5 Zoning Line: "Point E"	53	60	60
Riverside Street Entrance: "Point F"	64	70	70

7.0 CONCLUSIONS AND CONTROL MEASURES

The noise impact assessment for the proposed Schnitzer Northeast metal recycling facility indicates that predicted noise levels will comply with the most stringent local daytime noise regulations, provided that excavator operation occurs at least 85 feet away from any property line (with emphasis on the northern property line near Lucas Tree). Expected worst-case future sound levels from the baler, excavators, loaders, and truck back-up alarms will be slightly higher than the current property-line noise levels, but sound levels will still be within the noise regulation limits. Even assuming worst-case modeling scenarios, noise levels will not exceed 70 dBA at property lines to the west, south, or east of the main site building.

The recycling facility will be far enough away from all residential zones, such that noise from the facility will not exceed the 55 dBA maximum limit at any residentially-zoned properties. The actual R5 zoning boundary (near Waldron Way) is even further away from the proposed facility than "Point E" in the Cadna model. Traffic noise from Riverside Street will be the primary noise source near Waldron way.

An excavator sound source was also modeled at the far western edge of the facility, near the proposed retention pond. The Cadna model was used to predict the noise levels at the far-western property line (closest to the Westbrook town border). Even with this unrealistic, worst-case scenario, the sound levels will still be within both the City of Portland and the Maine DEP regulations. Sound levels due to facility operation will be below 55 dBA at the nearest Westbrook residences.

Should it be necessary to operate an excavator any closer than 85 feet from any property line, construction of a barrier would be required to meet the 70 dBA limit. At a minimum, a solid 15-foot-high barrier wall is recommended, with no gaps or holes within the barrier surface area. The barrier length would depend upon the anticipated operation pattern of the excavator. The barrier wall shall weigh at least 5 pounds per square foot and/or achieve a Sound Transmission Class (STC) rating of 30 or higher. The noise barrier wall may be a transportation-type noise barrier. It can be either solid wood or an acoustical "sandwich" panel filled with sound-absorptive material.

Appendix A

Maine DEP Solid Waste Management Rules, Chapter 400 Excerpt on Noise Regulations

06-096

Department of Environmental Protection

Maine Solid Waste Management Rules

CHAPTER 400

GENERAL PROVISIONS

Last Revised:
January 23, 2001

Chapter 400: GENERAL PROVISIONS

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ZZZZ. PCBs. "PCBs" means Polychlorinated Biphenyls; a class of chlorinated aromatic hydrocarbons representing a mixture of specific biphenyl hydrocarbons which are thermally and chemically very stable.

Aa. PCDD. "PCDD", also known as "Dioxin", means polychlorinated dibenzo-p-dioxin.

Bb. PCDF. "PCDF", also known as "Furan" means polychlorinated dibenzofuran.

Cc. Person. "Person" means any individual; partnership; corporation; firm; federal, state or local government entity; or public or private organization of any character.

Dd. Pollution. See **"Contamination or Pollution"** of this section.

Ee. Pre-development ambient sound. "Pre-development ambient sound" means the ambient sound at a specified location in the vicinity of a proposed or existing solid waste facility prior to that proposed facility's construction and operation or prior to an existing facility's expansion.

Ff. Primary sand and gravel recharge area. "Primary sand and gravel recharge area" means the surface area directly overlying sand and gravel formations that provide direct replenishment of ground water in sand and gravel and fractured bedrock aquifers. The term does not include areas overlying formations that have been identified as unsaturated and are not contiguous with saturated formations.

Gg. Processing facility. "Processing facility" means any land area, structure, equipment, machine, device, system, or combination thereof, other than incinerators, which is operated to reduce the volume or change the chemical or physical characteristics of solid waste. Processing facilities include but are not limited to facilities which employ shredding, baling, mechanical and magnetic separation, and composting or other stabilization techniques to reduce or otherwise change the nature of solid waste.

Hh. Property boundary. "Property boundary" means the outermost perimeter of the parcel of real property on which a solid waste facility is located.

Ii. Protected Location. "Protected location" means:

(1) Any location within a parcel of land which, at the time a solid waste facility application is submitted, either contains or has local approval for the construction of a residence, residential subdivision, house of worship, academic school, college, library, hospital or nursing home;

(2) Any location within:

(a) A state park;

(b) Baxter State Park;

(c) A National park;

(d) A historic site;

(e) A nature preserve owned by the Maine or National Audubon Society or the Maine Chapter of the Nature Conservancy;

(f) The Appalachian Trail;

(g) A National Wildlife Refuge;

(h) A federally-designated wilderness area; or

(i) State wilderness area designated by state statute, such as the Allagash Wilderness Waterway; or

(3) Any location within consolidated public reserve lands designated as a protected location by rule of the Bureau of Public Lands.

State and National Parks that do not have camping areas, houses of worship, schools, libraries, and historic sites are considered protected locations only during their regular hours of operation.

Jj. Protected natural resource. "Protected natural resource" means a coastal sand dune system, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, great ponds or rivers, streams or brooks, as these terms are defined in 38 MRSA section 480-B of the Natural Resources Protection Act.

Kk.Public entity. "Public entity" means a municipality or group of municipalities, a public waste disposal corporation under 38 MRSA section 1304-B, a refuse disposal district under 38 MRSA section 1702, *et seq.*, a county, State or Federal agency.

Ll. Public viewing area. "Public viewing area" means an area designated for the public to view scenic areas, historical sites, unusual natural features or public monuments. These areas include but are not limited to scenic highways; public easements; scenic turnouts; public monuments; and national, state or municipal parks.

Mm. Pug mill. "Pug mill" means any lined mixing chamber that uses an emulsified or cut-back asphalt binding agent to produce a bituminous product from an aggregate.

Nn. Putrescible Waste. "Putrescible waste" means solid waste that contains organic matter that can be rapidly decomposed by microorganisms, which may give rise to foul smelling, offensive products during such decomposition or which is capable of attracting or providing food for birds and potential disease carrying organisms such as rodents and flies.

Oo. Quantifiable noise standard. "Quantifiable noise standard" means a numerical limit governing noise that has been duly enacted by ordinance by the municipality.

Pp. R.C.R.A. "R.C.R.A." means the Resource Conservation and Recovery Act, 42 U.S.C.A. section 6901 *et seq.*

F. No Unreasonable Adverse Effect on Existing Uses and Scenic Character

(1) Standards. The solid waste facility may not unreasonably adversely affect existing uses and scenic character. Specifically, the facility may not:

(a) Present a bird hazard to aircraft;

(b) Have an unreasonable adverse effect on the preservation of historical sites;

(c) Unreasonably interfere with views from established public viewing areas;

(d) Generate excessive noise at the property boundary or at any protected location; or

(e) Unreasonably adversely affect existing uses of property neighboring the proposed solid waste facility.

(2) Noise Standards. The following noise standards shall apply to all solid waste facilities. Protected locations shall only include those locations defined in subsection 400.1 for which the hourly sound levels from the facility will be greater than 45 dBA.

(a) Sound Level Limits. The following hourly sound levels from routine operation of a solid waste facility must be less than or equal to;

(i) 75 dBA for daytime and nighttime hours at the facility property boundary;

(ii) 60 dBA for daytime hours and 50 dBA for nighttime hours at any protected location in an area for which the zoning, or, if unzoned, the existing use or use contemplated under a comprehensive plan, is not predominantly commercial or industrial; or

(iii) 70 dBA for daytime hours and 60 dBA for nighttime hours in an area for which the zoning, or if unzoned, the existing use or use contemplated under a comprehensive plan, is predominantly commercial or industrial.

(b) Alternative levels. If the applicant chooses to demonstrate by measurement that the daytime or nighttime pre-development ambient sound environment at any protected location exceeds the daytime or nighttime limits above, by at least 5 dBA, then the daytime or nighttime limits are 5 dBA more than the measured daytime or nighttime pre-development ambient hourly sound level at the location of the measurement for the corresponding time period.

(c) Existing Facilities. For any protected location near an existing solid waste facility, the hourly sound level limit for routine operation of the existing facility and all future expansions of that facility is the hourly sound level written above, or at the applicant's election, the existing hourly sound level from routine operation of the facility before any expansions plus 3 dBA.

(d) All equipment used in the construction of and maintenance activities at the solid waste facility must comply with applicable local and federal noise regulations, and include

environmental noise control devices in proper working condition and maintained as originally provided with the equipment by its manufacturer.

(e) Sounds associated with the following are exempt from the sound level limits of this section:

(i) routine engine sounds from registered and inspected motor vehicles:

a. while operating on public ways, or

b. that enter the facility to make a delivery or pickup and that are moving, starting or stopping, but not when they are parked with the engine running for over 60 minutes in the facility.

(ii) the unamplified human voice and other sounds of natural origin.

(iii) emergency maintenance and repairs.

(iv) facility and vehicle warning signals and alarms so long as used in appropriate circumstances.

(v) safety and protective devices installed in accordance with the devices' installation instructions.

(vi) boiler start-up, testing and maintenance operations occurring no more frequently than once per month.

(vii) test operations of emergency equipment occurring in the daytime and no more frequently than once per week.

(viii) major concrete pours that must extend after 7:00 p. m., when started before 3:00 p. m.

(ix) snow removal, landscaping and street sweeping activities.

(x) sound from a regulated development received at a protected location when the generator of the sound has been conveyed a noise easement for that location. This exemption shall only be for the specific noise, land and term covered by the easement.

(3) Submissions. Applications must include evidence that affirmatively demonstrates that the proposed solid waste facility will not unreasonably adversely affect existing uses and scenic character, including the following information:

(a) The nature, location, design, and size of all buffers and visual screens within those buffers to be established or retained;

(b) A description of the existing land uses in the vicinity of the proposed solid waste facility, all airport runways within 10,000 feet of the facility; all historic sites, protected locations and established public viewing areas within 2,000 feet;

(c) A demonstration that the solid waste facility will comply with the noise standards in paragraph 2 above and that the applicant will make adequate provision to control noise and the sound levels from each source resulting from the routine operation of the facility at the property boundary and any protected locations within the area;

(d) Evidence that acoustic enclosure for noise, buffer strips and screens, or other noise reduction measures have been considered and implemented in the design of the solid waste facility.

Appendix B

City of Portland Noise Regulation

(h) All food processing waste shall be stored within a completely enclosed structure and if not refrigerated shall be removed from the site in an enclosed container within forty-eight (48) hours of its generation. All enclosed and exterior food processing waste storage areas shall be cleaned and sanitized on a regular basis.

(i) Outdoor storage of refuse, debris or previously used materials awaiting reuse shall be either in an appropriate container or located within a designated, screened area.

(j) Any permitted outdoor storage of materials shall be done in such a manner as to prevent the breeding and harboring of insects or vermin, to prevent the transfer of such materials from the site by natural causes or forces and to contain fumes, dust, or other materials which constitute a fire hazard. This storage shall be accomplished within enclosed containers or by one (1) or more of the following methods: raising materials above ground, separating materials, preventing stagnant water, or by some other means. No outdoor storage shall be permitted between the front of any building on the site and the street, except for storage for plant and tree nurseries or lumber yards.
(Ord. No. 164-97, § 7, 1-6-97)

Sec. 14-252. Performance standards.

Uses in the I-M, I-Ma, and I-Mb zones shall meet the following standards:

(a) *Noise:*

1. *Definitions:*

a. Tonal sounds are defined as sound waves usually perceived as a hum or whine because their instantaneous sound pressure varies essentially as a simple sinusoidal function of time.

b. Impulse sounds are defined as sound events characterized by brief excursions of sound pressure, each with a duration of less than one (1) second.

2. *Measurement:* Sound levels shall be measured with a sound level meter with a frequency weighting network manufactured according to standards prescribed by the American National Standards Institute (ANSI) or its successor body. Measurements shall be made at all major lot lines of the site, at a height of at least four (4) feet above the ground surface. In measuring sound levels under this section, sounds with a continuous duration of less than sixty (60) seconds shall be measured by the maximum reading on a sound level meter set to the A weighted scale and the fast meter response (L maxfast). Sounds with a continuous duration of sixty (60) seconds or more shall be measured on the basis of the energy average sound level over a period of sixty (60) seconds (LEQ_1).

3. *Maximum permissible sound levels:* The maximum permissible sound level of any continuous, regular or frequent source of sound produced by an activity shall be as follows:

   a. Seventy (70) dBA between the hours of 7:00 a.m. and 10:00 p.m.

   b. Fifty-five (55) dBA between the hours of 10:00 p.m. and 7:00 a.m., as measured at or within the boundaries of any residential zone.

   In addition to the sound level standards established above, all uses located within this zone shall employ best practicable sound abatement techniques to prevent tonal sounds and impulse sounds or, if such tonal and impulse sounds cannot be prevented, to minimize the impact of such sounds in residential zones.

4. *Exemptions:*

   a. Noises created by construction and maintenance activities between 7:00 a.m. and 10:00 p.m. are exempt from the maximum permissible sound levels set forth in subsection (d)3 of this

section. Construction activities on a site abutting any residential use between the hours of 10:00 p.m. of one (1) day and 7:00 a.m. of the following day shall not exceed fifty (50) dBA.

b. The following uses and activities shall also be exempt from the requirements of subsection (d)3 of this section:

i. The noises of safety signals, warning devices, emergency pressure relief valves, and any other emergency devices.

ii. Traffic noise on public roads or noise created by airplanes and railroads.

iii. Noise created by refuse and solid waste collection, provided that the activity is conducted between 6:00 a.m. and 7:00 p.m.

iv. Emergency construction or repair work by public utilities, at any hour.

v. Noise created by any recreational activities which are permitted by law and for which a license or permit has been granted by the city, including but not limited to parades, sporting events, and fireworks displays.

(b) *Electromagnetic interference:* There shall be no electromagnetic interference that adversely affects the operation of any equipment other than that belonging to the creator of such interference, or that does not conform to the regulations of the Federal Communications Commission.

(c) *Vibrations:* Any use creating earthshaking vibrations shall be controlled in such a manner as to prevent transmission beyond lot lines of vibrations causing a displacement of .003 or greater on one (1) inch, as measured by a vibrograph or similar instrument at the property boundaries.

or portion of a lot located in a shoreland zone as identified on the city shoreland zoning map or in a flood hazard zone shall be subject to the requirements of division 26 and/or division 26.5 of this article.

(e) All uses shall be operated within a fully enclosed structure, except for those customarily operated in open air.

(f) Any storage of new materials, finished products, or related equipment must be suitably screened from the public way and from abutting nonindustrial use properties by a solid fence at least five (5) feet in height, or by a solid evergreen planting strip.

(g) All waste shall be stored in covered containers that do not leak or otherwise permit liquids or solids to escape from the container.

(h) All food processing waste shall be stored within a completely enclosed structure and if not refrigerated shall be removed from the site in an enclosed container within forty-eight (48) hours of its generation. All enclosed and exterior food processing waste storage areas shall be cleaned and sanitized on a regular basis.

(i) Outdoor storage of refuse, debris or material awaiting reuse shall be in an appropriate container or located within a designated, screened area.

(j) Any permitted outdoor storage of materials shall be done in such a manner as to prevent the breeding and harboring of insects or vermin, to prevent the transfer of such materials from the site by natural causes or forces and to contain fumes, dust, or other materials which constitute a fire hazard. This storage shall be accomplished within enclosed containers or by one (1) or more of the following methods: raising materials above ground, separating materials, preventing stagnant water, or by some other means. No outdoor storage shall be permitted between the front of any building on the site and the street, except for storage for plant and tree nurseries or lumber yards.
(Ord. No. 164-97, § 8, 1-6-97)

Sec. 14-267. Performance standards.

Uses in the I-H and I-Hb zones shall meet the following

(a) *Required landscaping:* Where a front yard abuts an arterial or a major collector street, it shall be landscaped. Rear yards, side yards and the perimeter of any parking area for greater than fifteen (15) vehicles shall be landscaped if visible from a street, public open space or residential zone.

(b) *Noise:*

1. *Definitions:*

a. Tonal sounds are defined as sound waves usually perceived as a hum or whine because their instantaneous sound pressure varies essentially as a simple sinusoidal function of time.

b. Impulse sounds are defined as sound events characterized by brief excursions of sound pressure, each with a duration of less than one (1) second.

2. *Measurement:* Sound levels shall be measured with a sound level meter with a frequency weighting network manufactured according to standards prescribed by the American National Standards Institute (ANSI) or its successor body. Measurements shall be made at all major lot lines of the site, at a height of at least four (4) feet above the ground surface. In measuring sound levels under this section, sounds with a continuous duration of less than sixty (60) seconds shall be measured by the maximum reading on a sound level meter set to the A weighted scale and the fast meter response (L maxfast). Sounds with a continuous duration of sixty (60) seconds or more shall be measured on the basis of the energy average sound level over a period of sixty (60) seconds (LEQ_1).

3. *Maximum permissible sound levels:* The maximum permissible sound level of any continuous, regular or frequent source of sound produced by an activity

shall be as follows:

a. Seventy-five (75) dBA between the hours of 7:00 a.m. and 10:00 p.m.

b. Fifty-five (55) dBA between the hours of 10:00 p.m. and 7:00 a.m., as measured at or within the boundaries of any residential zone.

In addition to the sound level standards established above, all uses located within this zone shall employ best practicable sound abatement techniques to prevent tonal sounds and impulse sounds or, if such tonal and impulse sounds cannot be prevented, to minimize the impact of such sounds in residential zones.

4. *Exemptions:*

a. Noises created by construction and maintenance activities between 7:00 a.m. and 10:00 p.m. are exempt from the maximum permissible sound levels set forth in subsection (a)3 of this section. Construction activities on a site abutting any residential use between the hours of 10:00 p.m. of one (1) day and 7:00 a.m. of the following day shall not exceed fifty (50) dBA.

b. The following uses and activities shall also be exempt from the requirements of subsection (a)3 of this section:

i. The noises of safety signals, warning devices, emergency pressure relief valves, and any other emergency devices.

ii. Traffic noise on public roads or noise created by airplanes and railroads.

iii. Noise created by refuse and solid waste collection, provided that the activity is conducted between 6:00 a.m. and 7:00 p.m.

iv. Emergency construction or repair work by

public utilities, at any hour.

v. Noise created by any recreational activities which are permitted by law and for which a license or permit has been granted by the city, including but not limited to parades, sporting events, and fireworks displays.

(b) *Electromagnetic interference:* There shall be no electromagnetic interference that adversely affects the operation of any equipment other than that belonging to the creator of such interference, or that does not conform to the regulations of the Federal Communications Commission.

(c) *Vibrations:* Any use creating earthshaking vibrations shall be controlled in such a manner as to prevent transmission beyond lot lines of vibrations causing a displacement of .003 or greater on one (1) inch, as measured by a vibrograph or similar instrument at the property boundaries.

(d) *Glare, heat:* Any use shall be in an enclosed structure in such a manner that glare and heat shall be imperceptible from neighboring properties.

(e) *Discharge of toxic or noxious matter:* All discharges of toxic or noxious matter shall be made in accordance with all applicable state and federal regulations.

(f) *Odor:* It shall be a violation of this chapter to create an odor nuisance.

1. *Determination of odor nuisance:* An odor nuisance shall be considered to exist when ten (10) confirmed complaints occur in an area within two (2) separate twenty-four-hour periods. The ten (10) confirmed complaints must originate from ten (10) different households in an area zoned residential or from ten (10) different individuals in a commercial or industrial facility. The building authority shall only respond to a complainant who confirms that the odor is detectable at the time of the actual complaint. In order to confirm a

Appendix C

Portland Airport Weather Data, July 11, 2007

Station: PORTLAND PORTLAND INTERNATIONAL JETPORT Latitude: 43.64222 Longitude: -70.30444 Elevation: 22 m or 72 feet

Decoded Surface Observations for July 11, 2007

The weather observed at PORTLAND, ME (KPWM) at 05:51 AM EDT was:
The skies were unobserved.
The weather reported was fog.
Temperature: 61F (16C) Dewpoint: 61F (16C) Relative Humidity: 100%
Winds from the ESE(110 degs) at 5 mph.
Pressure: 1011.9 millibars. Altimeter:29.88 inches of mercury.
The prevailing visibility was .25 miles.

The weather observed at PORTLAND, ME (KPWM) at 06:51 AM EDT was:
The skies were unobserved.
The weather reported was fog.
Temperature: 61F (16C) Dewpoint: 61F (16C) Relative Humidity: 100%
Winds from the CLM(CLM degs) at 0 mph.
Pressure: 1011.7 millibars. Altimeter:29.88 inches of mercury.
The prevailing visibility was .12 miles.

The weather observed at PORTLAND, ME (KPWM) at 07:51 AM EDT was:
The skies were unobserved.
The weather reported was fog.
Temperature: 62F (17C) Dewpoint: 61F (16C) Relative Humidity: 96%
Winds from the CLM(CLM degs) at 0 mph.
Pressure: 1011.6 millibars. Altimeter:29.88 inches of mercury.
The prevailing visibility was 0 miles.
The maximum temperature in the past 6 hours was 62F.
The minimum temperature in the past 6 hours was 60F.

The weather observed at PORTLAND, ME (KPWM) at 08:51 AM EDT was:
The skies were cloudy.
The weather reported was fog.
Temperature: 63F (17C) Dewpoint: 63F (17C) Relative Humidity: 100%
Winds from the CLM(CLM degs) at 0 mph.
Pressure: 1011.6 millibars. Altimeter:29.87 inches of mercury.
The prevailing visibility was .5 miles.
There has been 0.01 inches of precipitation in the past hour.

The weather observed at PORTLAND, ME (KPWM) at 09:51 AM EDT was:
The skies were cloudy.
The weather reported was fog.
Temperature: 66F (19C) Dewpoint: 66F (19C) Relative Humidity: 100%
Winds from the CLM(CLM degs) at 0 mph.
Pressure: 1011.3 millibars. Altimeter:29.87 inches of mercury.
The prevailing visibility was 3 miles.

The weather observed at PORTLAND, ME (KPWM) at 10:51 AM EDT was:
The skies were cloudy.
The weather reported was fog.
Temperature: 68F (20C) Dewpoint: 67F (19C) Relative Humidity: 96%
Winds were not reported.
Pressure: 1011.0 millibars. Altimeter:29.86 inches of mercury.
The prevailing visibility was 4 miles.
There has been 0.01 inches of precipitation in the past 6 hours.

The weather observed at PORTLAND, ME (KPWM) at 11:51 AM EDT was:
The skies were cloudy.
The weather reported was fog.

Temperature: 68F (20C) Dewpoint: 66F (19C) Relative Humidity: 94%
Winds from the S (170 degs) at 8 mph.
Pressure: 1010.4 millibars. Altimeter:29.84 inches of mercury.
The prevailing visibility was 2 miles.

The weather observed at PORTLAND, ME (KPWM) at 12:51 PM EDT was:
The skies were cloudy.
The weather reported was fog.
Temperature: 70F (21C) Dewpoint: 66F (19C) Relative Humidity: 88%
Winds from the S (170 degs) at 15 mph.
Pressure: 1009.8 millibars. Altimeter:29.82 inches of mercury.
The prevailing visibility was 2 miles.

The weather observed at PORTLAND, ME (KPWM) at 01:51 PM EDT was:
The skies were cloudy.
The weather reported was fog.
Temperature: 71F (22C) Dewpoint: 68F (20C) Relative Humidity: 90%
Winds from the SSW(200 degs) at 10 mph.
Pressure: 1008.7 millibars. Altimeter:29.79 inches of mercury.
The prevailing visibility was 3 miles.
The maximum temperature in the past 6 hours was 71F.
The minimum temperature in the past 6 hours was 62F.
There has been 0.01 inches of precipitation in the past 6 hours.

The weather observed at PORTLAND, ME (KPWM) at 02:51 PM EDT was:
The skies were cloudy.
Temperature: 72F (22C) Dewpoint: 68F (20C) Relative Humidity: 87%
Winds from the SSE(160 degs) at 13 mph.
Pressure: 1008.1 millibars. Altimeter:29.77 inches of mercury.
The prevailing visibility was 10 miles.

The weather observed at PORTLAND, ME (KPWM) at 03:51 PM EDT was:
The skies were cloudy.
Temperature: 72F (22C) Dewpoint: 68F (20C) Relative Humidity: 87%
Winds from the S (180 degs) at 15 mph.
Pressure: 1007.5 millibars. Altimeter:29.75 inches of mercury.
The prevailing visibility was 10 miles.

The weather observed at PORTLAND, ME (KPWM) at 04:51 PM EDT was:
The skies were mostly cloudy.
Temperature: 72F (22C) Dewpoint: 68F (20C) Relative Humidity: 87%
Winds from the S (180 degs) at 17 mph.
Pressure: 1006.8 millibars. Altimeter:29.73 inches of mercury.
The prevailing visibility was 10 miles.

The weather observed at PORTLAND, ME (KPWM) at 05:51 PM EDT was:
The skies were mostly cloudy.
Temperature: 70F (21C) Dewpoint: 67F (19C) Relative Humidity: 90%
Winds from the S (180 degs) at 13 mph.
Pressure: 1006.6 millibars. Altimeter:29.73 inches of mercury.
The prevailing visibility was 9 miles.

The weather observed at PORTLAND, ME (KPWM) at 06:51 PM EDT was:
The skies were mostly clear.
Temperature: 71F (22C) Dewpoint: 67F (19C) Relative Humidity: 87%
Winds from the S (180 degs) at 14 mph.
Pressure: 1005.9 millibars. Altimeter:29.71 inches of mercury.
The prevailing visibility was 10 miles.

Appendix D

Sound Level Meter Calibration Certificates

Larson Davis

A PCB Group Co.

Certificate of Calibration and Conformance

Certificate Number 2007-89718

Instrument Model 812, Serial Number 0632, was calibrated on 29JAN2007. The instrument meets factory specifications per Procedure D0001.8160, ANSI S1.4 1983, IEC 651-Type 1 1979, and IEC 804-Type 1 1985.

Instrument found to be in calibration as received: YES
Date Calibrated: 29JAN2007
Calibration due: 29JAN2008

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0277 / 0109	12 Months	05APR2007	2006-78756

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 19 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Corporate Headquarters. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

This calibration complies with the requirements of ISO 17025 and ANSI Z540. The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

Tested with PRM828-1853
"AS RECEIVED" data same as shipped data.

Signed: _____

Technician: Ron Harris

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Toll Free: 888-258-3222
Tel: 801-375-0177
Fax: 801-375-0182
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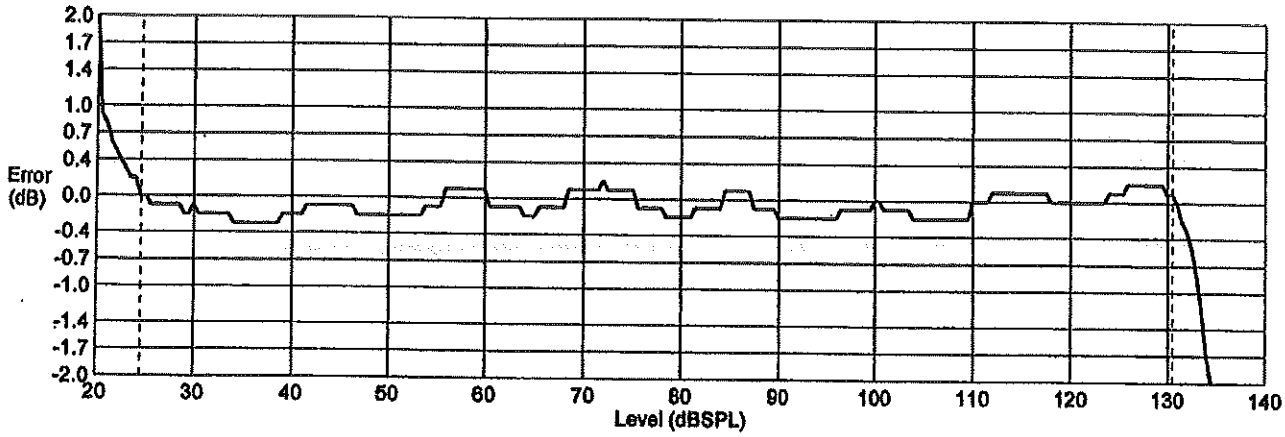
Tel: 716-926-8243
Fax: 716-926-8215
info@LarsonDavis.com
www.LarsonDavis.com

Sound Level Meter Model: 812 Serial Number: A0632
Log Linearity, Differential Linearity and Range Data

This Type 1 Sound Level Meter (including attached PRM828 preamplifier and ADP005 18 pF input adapter) was calibrated with a reference 1kHz sine wave at a level of 114.0 dBSPL. The instrument's Log Linerarity A-weighted slow response was then electrically tested using a 1kHz sine wave from 18.0 dBSPL to 138.0 dBSPL in 0.5 dB increments.



Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB
18.0	20.3	2.3	38.5	38.2	-0.3	59.0	59.1	0.1	79.5	79.3	-0.2	100.0	100.0	0.0	120.5	120.5	0.0
18.5	20.5	2.0	39.0	38.8	-0.2	59.5	59.6	0.1	80.0	79.8	-0.2	100.5	100.5	0.0	121.0	121.0	0.0
19.0	20.6	1.6	39.5	39.3	-0.2	60.0	60.1	0.1	80.5	80.3	-0.2	101.0	100.9	-0.1	121.5	121.5	0.0
19.5	20.9	1.4	40.0	39.8	-0.2	60.5	60.4	-0.1	81.0	80.8	-0.2	101.5	101.4	-0.1	122.0	122.0	0.0
20.0	21.1	1.1	40.5	40.3	-0.2	61.0	60.9	-0.1	81.5	81.4	-0.1	102.0	101.9	-0.1	122.5	122.5	0.0
20.5	21.4	0.9	41.0	40.8	-0.2	61.5	61.4	-0.1	82.0	81.9	-0.1	102.5	102.4	-0.1	123.0	123.0	0.0
21.0	21.8	0.8	41.5	41.4	-0.1	62.0	61.9	-0.1	82.5	82.4	-0.1	103.0	102.9	-0.1	123.5	123.5	0.0
21.5	22.1	0.6	42.0	41.9	-0.1	62.5	62.4	-0.1	83.0	82.9	-0.1	103.5	103.4	-0.1	124.0	124.1	0.1
22.0	22.5	0.5	42.5	42.4	-0.1	63.0	62.9	-0.1	83.5	83.4	-0.1	104.0	103.8	-0.2	124.5	124.6	0.1
22.5	22.9	0.4	43.0	42.9	-0.1	63.5	63.4	-0.1	84.0	83.9	-0.1	104.5	104.3	-0.2	125.0	125.1	
23.0	23.3	0.3	43.5	43.4	-0.1	64.0	63.8	-0.2	84.5	84.6	0.1	105.0	104.8	-0.2	125.5	125.6	
23.5	23.7	0.2	44.0	43.9	-0.1	64.5	64.3	-0.2	85.0	85.1	0.1	105.5	105.3	-0.2	126.0	126.2	0.2
24.0	24.2	0.2	44.5	44.4	-0.1	65.0	64.8	-0.2	85.5	85.6	0.1	106.0	105.8	-0.2	126.5	126.7	0.2
24.5	24.5	0.0	45.0	44.9	-0.1	65.5	65.4	-0.1	86.0	86.1	0.1	106.5	106.3	-0.2	127.0	127.2	0.2
25.0	25.0	0.0	45.5	45.4	-0.1	66.0	65.9	-0.1	86.5	86.6	0.1	107.0	106.8	-0.2	127.5	127.7	0.2
25.5	25.4	-0.1	46.0	45.9	-0.1	66.5	66.4	-0.1	87.0	87.1	0.1	107.5	107.3	-0.2	128.0	128.2	0.2
26.0	25.9	-0.1	46.5	46.4	-0.1	67.0	66.9	-0.1	87.5	87.4	-0.1	108.0	107.8	-0.2	128.5	128.7	0.2
26.5	26.4	-0.1	47.0	46.8	-0.2	67.5	67.4	-0.1	88.0	87.9	-0.1	108.5	108.3	-0.2	129.0	129.2	0.2
27.0	26.9	-0.1	47.5	47.3	-0.2	68.0	67.9	-0.1	88.5	88.4	-0.1	109.0	108.8	-0.2	129.5	129.7	0.2
27.5	27.4	-0.1	48.0	47.8	-0.2	68.5	68.6	0.1	89.0	88.9	-0.1	109.5	109.3	-0.2	130.0	130.1	0.1
28.0	27.9	-0.1	48.5	48.3	-0.2	69.0	69.1	0.1	89.5	89.4	-0.1	110.0	110.0	0.0	130.5	130.6	0.1
28.5	28.4	-0.1	49.0	48.8	-0.2	69.5	69.6	0.1	90.0	89.8	-0.2	110.5	110.5	0.0	131.0	131.0	0.0
29.0	28.8	-0.2	49.5	49.3	-0.2	70.0	70.1	0.1	90.5	90.3	-0.2	111.0	111.0	0.0	131.5	131.3	-0.2
29.5	29.3	-0.2	50.0	49.8	-0.2	70.5	70.6	0.1	91.0	90.8	-0.2	111.5	111.5	0.0	132.0	131.7	-0.3
30.0	29.9	-0.1	50.5	50.3	-0.2	71.0	71.1	0.1	91.5	91.3	-0.2	112.0	112.1	0.1	132.5	132.0	-0.5
30.5	30.3	-0.2	51.0	50.8	-0.2	71.5	71.6	0.1	92.0	91.8	-0.2	112.5	112.6	0.1	133.0	132.2	-0.8
31.0	30.8	-0.2	51.5	51.3	-0.2	72.0	72.2	0.2	92.5	92.3	-0.2	113.0	113.1	0.1	133.5	132.3	-1.2
31.5	31.3	-0.2	52.0	51.8	-0.2	72.5	72.6	0.1	93.0	92.8	-0.2	113.5	113.6	0.1	134.0	132.3	-1.7
32.0	31.8	-0.2	52.5	52.3	-0.2	73.0	73.1	0.1	93.5	93.3	-0.2	114.0	114.1	0.1	134.5	132.3	-2.2
32.5	32.3	-0.2	53.0	52.8	-0.2	73.5	73.6	0.1	94.0	93.8	-0.2	114.5	114.6	0.1	135.0	132.3	-2.7
33.0	32.8	-0.2	53.5	53.3	-0.2	74.0	74.1	0.1	94.5	94.3	-0.2	115.0	115.1	0.1	135.5	132.2	-3.3
33.5	33.3	-0.2	54.0	53.9	-0.1	74.5	74.6	0.1	95.0	94.8	-0.2	115.5	115.6	0.1	136.0	132.2	-3.8
34.0	33.7	-0.3	54.5	54.4	-0.1	75.0	75.1	0.1	95.5	95.3	-0.2	116.0	116.1	0.1	136.5	132.1	-4.4
34.5	34.2	-0.3	55.0	54.9	-0.1	75.5	75.4	-0.1	96.0	95.8	-0.2	116.5	116.6	0.1	137.0	132.2	-4.8
35.0	34.7	-0.3	55.5	55.4	-0.1	76.0	75.9	-0.1	96.5	96.4	-0.1	117.0	117.1	0.1	137.5	132.3	-5.2
35.5	35.2	-0.3	56.0	56.1	0.1	76.5	76.4	-0.1	97.0	96.9	-0.1	117.5	117.6	0.1	138.0	132.3	-5.7
36.0	35.7	-0.3	56.5	56.6	0.1	77.0	76.9	-0.1	97.5	97.4	-0.1	118.0	118.0	0.0			
36.5	36.2	-0.3	57.0	57.1	0.1	77.5	77.4	-0.1	98.0	97.9	-0.1	118.5	118.5	0.0			
37.0	36.7	-0.3	57.5	57.6	0.1	78.0	77.9	-0.1	98.5	98.4	-0.1	119.0	119.0	0.0			
37.5	37.2	-0.3	58.0	58.1	0.1	78.5	78.3	-0.2	99.0	98.9	-0.1	119.5	119.5	0.0			
38.0	37.7	-0.3	58.5	58.6	0.1	79.0	78.8	-0.2	99.5	99.4	-0.1	120.0	120.0	0.0			

Plotted per typical sensitivity of a 2541 microphone; 44.5 mV/Pa & 17.1 pF.

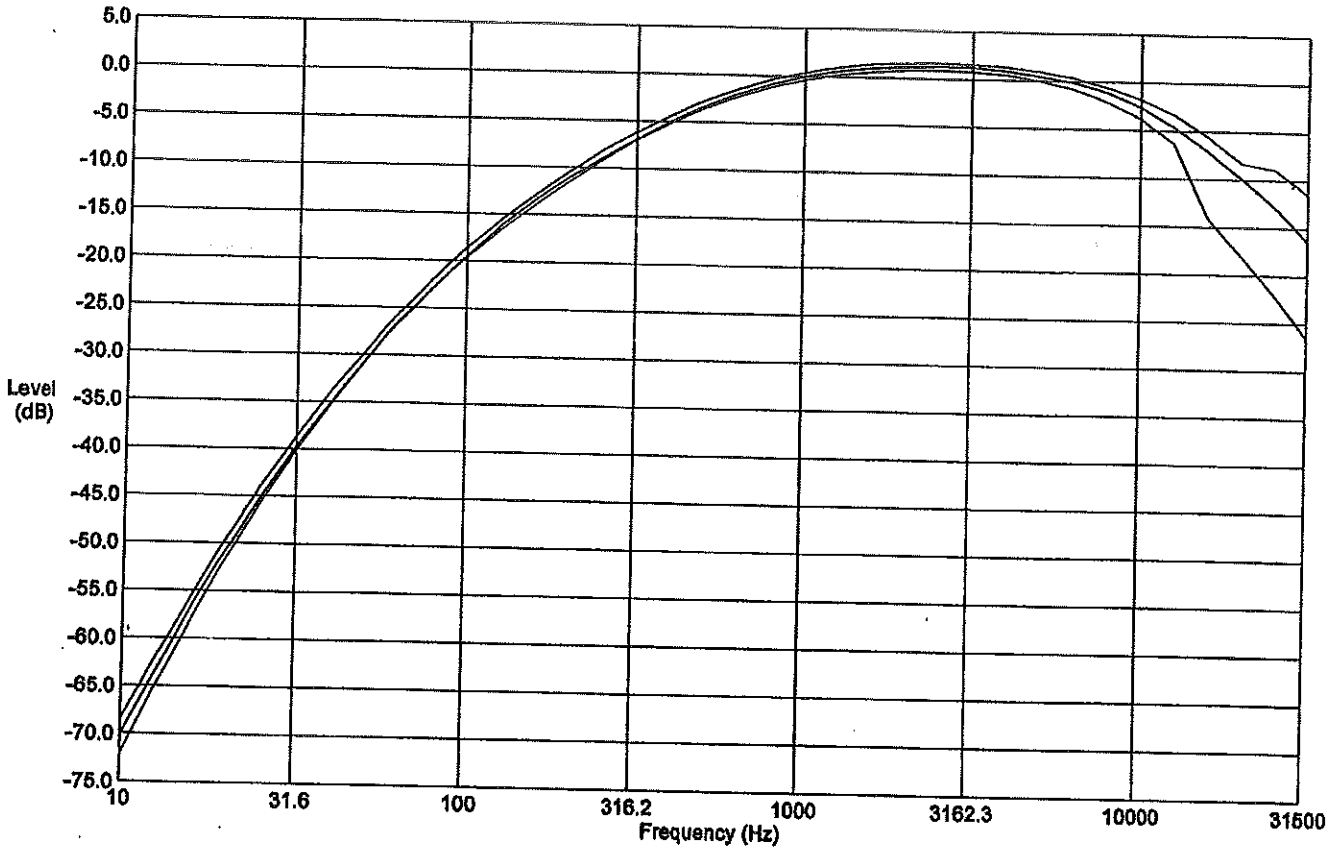
Overload occurs at 130.6 dBSPL.
Primary indicator range: 106.0 dB (lower limit: 24.5 dBSPL to upper limit: 130.5 dBSPL).
Dynamic range: 112.7 dB (noise floor: 17.8 dBSPL to upper limit: 130.5 dBSPL).

This instrument is in compliance with IEC 60651 (2001-10) 7.9 and 7.10, ANSI S1.4-1983 3.2 and IEC 60804 (2001-10) 9.2.1 for Type 1 sound level meters when used with a Larson Davis Type 1 microphone.

Technician: Ron Harris Test Date: 29JAN2007

Sound Level Meter Model: 812 Serial Number: A0632
Certificate of A-Weight Electrical Conformance

This Type 1 Sound Level Meter (including attached PRM828 preamplifier and ADP005 16 pF input adapter) was calibrated with a reference 1kHz sine wave at a level of 114.0 dBSPL. The instrument's A-weighted response was then electrically tested using a 2.1 Vrms sinewave at exact frequencies as specified in IEC 60651 (2001-10) and ANSI S1.4-1983.



Freq (Hz)	Theor	Measured	Error	Tolerance
10.00	-70.4	-70.20	0.20	+1.8, -1.8
12.59	-63.4	-63.40	0.00	+1.5, -1.5
15.85	-56.7	-56.50	0.20	+1.2, -1.2
19.95	-50.5	-50.70	-0.20	+1.0, -1.0
25.12	-44.7	-45.00	-0.30	+0.9, -0.9
31.62	-39.4	-39.70	-0.30	+0.7, -0.7
39.81	-34.6	-35.10	-0.50	+0.7, -0.7
50.12	-30.2	-30.60	-0.40	+0.5, -0.5
63.10	-26.2	-26.50	-0.30	+0.5, -0.5
79.43	-22.5	-22.90	-0.40	+0.5, -0.5
100.00	-19.1	-19.50	-0.40	+0.5, -0.5
125.89	-16.1	-16.20	-0.10	+0.5, -0.5
158.49	-13.4	-13.40	0.00	+0.5, -0.5
199.53	-10.9	-11.00	-0.10	+0.5, -0.5
251.19	-8.6	-8.90	-0.30	+0.5, -0.5
316.23	-6.6	-6.90	-0.30	+0.4, -0.4
398.11	-4.8	-5.00	-0.20	+0.4, -0.4
501.19	-3.2	-3.40	-0.20	+0.4, -0.4

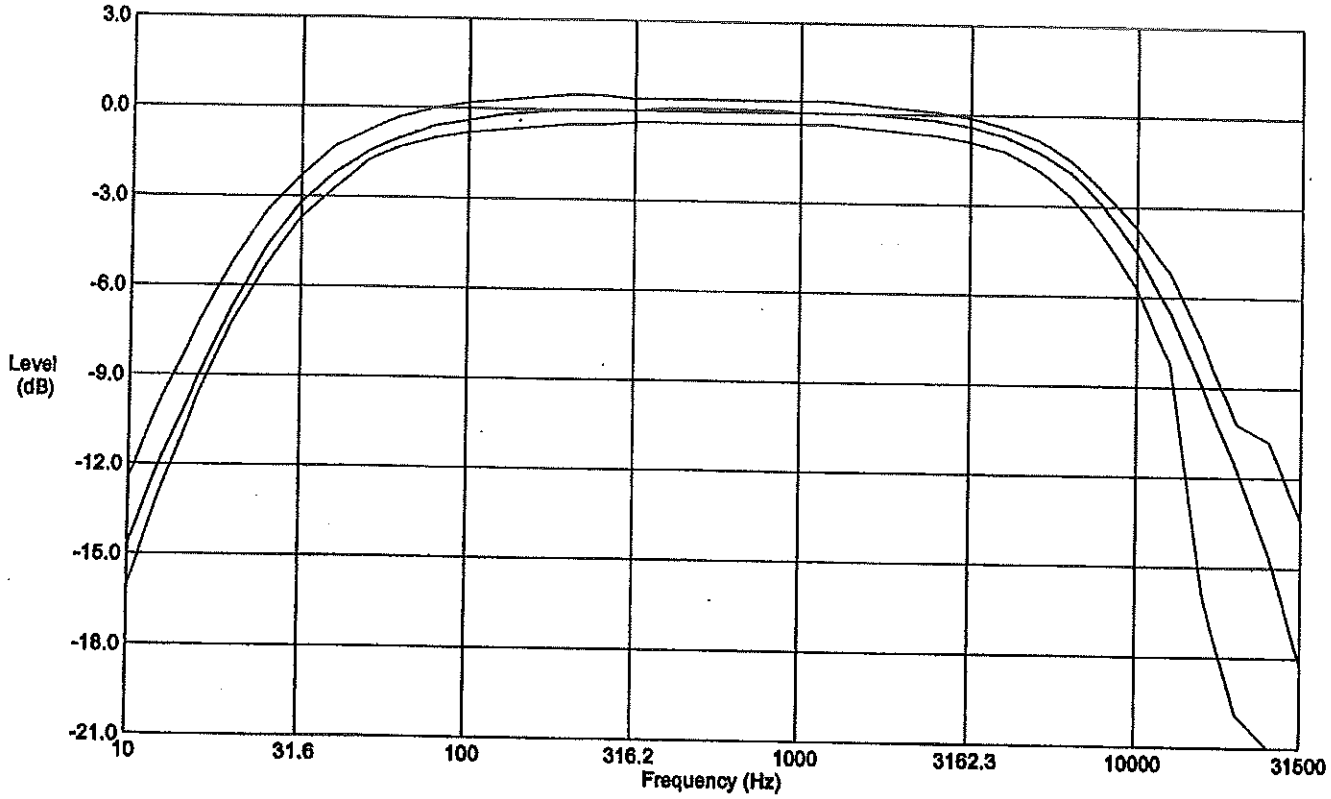
Freq (Hz)	Theor	Measured	Error	Tolerance
630.96	-1.9	-2.00	-0.10	+0.4, -0.4
794.33	-0.8	-0.90	-0.10	+0.4, -0.4
1000.00	0.0	0.00	0.00	+0.4, -0.4
1258.90	0.6	0.60	0.00	+0.4, -0.4
1584.90	1.0	1.00	0.00	+0.4, -0.4
1995.30	1.2	1.20	0.00	+0.4, -0.4
2511.90	1.3	1.30	0.00	+0.4, -0.4
3162.30	1.2	1.30	0.10	+0.4, -0.4
3981.10	1.0	1.00	0.00	+0.4, -0.4
5011.90	0.5	0.50	0.00	+0.5, -0.5
6309.60	-0.1	-0.10	0.00	+0.5, -0.7
7943.30	-1.1	-1.10	0.00	+0.5, -1.0
10000.00	-2.5	-2.60	-0.10	+0.7, -1.3
12589.00	-4.3	-4.60	-0.30	+1.0, -2.0
15849.00	-6.6	-7.10	-0.50	+1.0, -7.4
19953.00	-9.3	-9.90	-0.60	+1.0, -8.7
25119.00	-12.4	-12.80	-0.40	+3.5, -9.6
31623.00	-15.8	-16.40	-0.60	+4.3, -10.7

This instrument is in compliance with IEC 60651 (2001-10) 6.1 and 9.2.2, ANSI S1.4-1983 5.1 and 8.2.1, and IEC 60804 (2001-10) 5.1 for Type 1 sound level meters when used with a Larson Davis Type 1 microphone.

Technician: Ron Harris Test Date: 29JAN2007

Sound Level Meter Model: 812 Serial Number: A0632
Certificate of C-Weight Electrical Conformance

This Type 1 Sound Level Meter (including attached PRM828 preamplifier and ADP005 18 pF input adapter) was calibrated with a reference 1kHz sine wave at a level of 114.0 dBSPL. The instrument's C-weighted response was then electrically tested using a 2.1 Vrms sinewave at exact frequencies as specified in IEC 60651 (2001-10) and ANSI S1.4-1983.



Freq (Hz)	Theor	Measured	Error	Tolerance
10.00	-14.3	-14.70	-0.40	+1.8, -1.8
12.59	-11.2	-11.70	-0.50	+1.5, -1.5
15.85	-8.5	-9.10	-0.60	+1.2, -1.2
19.95	-6.2	-6.70	-0.50	+1.0, -1.0
25.12	-4.4	-4.70	-0.30	+0.9, -0.9
31.62	-3.0	-3.20	-0.20	+0.7, -0.7
39.81	-2.0	-2.20	-0.20	+0.7, -0.7
50.12	-1.3	-1.50	-0.20	+0.5, -0.5
63.10	-0.8	-1.00	-0.20	+0.5, -0.5
79.43	-0.5	-0.60	-0.10	+0.5, -0.5
100.00	-0.3	-0.40	-0.10	+0.5, -0.5
125.89	-0.2	-0.20	0.00	+0.5, -0.5
158.49	-0.1	-0.10	0.00	+0.5, -0.5
199.53	0.0	0.00	0.00	+0.5, -0.5
251.19	0.0	0.00	0.00	+0.5, -0.5
316.23	0.0	0.00	0.00	+0.4, -0.4
398.11	0.0	0.10	0.10	+0.4, -0.4
501.19	0.0	0.10	0.10	+0.4, -0.4

Freq (Hz)	Theor	Measured	Error	Tolerance
630.96	0.0	0.10	0.10	+0.4, -0.4
794.33	0.0	0.10	0.10	+0.4, -0.4
1000.00	0.0	0.00	0.00	+0.4, -0.4
1258.90	0.0	0.00	0.00	+0.4, -0.4
1584.90	-0.1	0.00	0.10	+0.4, -0.4
1995.30	-0.2	-0.10	0.10	+0.4, -0.4
2511.90	-0.3	-0.20	0.10	+0.4, -0.4
3162.30	-0.5	-0.40	0.10	+0.4, -0.4
3981.10	-0.8	-0.70	0.10	+0.4, -0.4
5011.90	-1.3	-1.20	0.10	+0.5, -0.5
6309.60	-2.0	-1.90	0.10	+0.5, -0.7
7943.30	-3.0	-3.00	0.00	+0.5, -1.0
10000.00	-4.4	-4.50	-0.10	+0.7, -1.3
12589.00	-6.2	-6.50	-0.30	+1.0, -2.0
15849.00	-8.5	-9.00	-0.50	+1.0, -7.4
19953.00	-11.2	-11.70	-0.50	+1.0, -8.7
25119.00	-14.3	-14.60	-0.30	+3.5, -9.6
31623.00	-17.7	-18.20	-0.50	+4.3, -10.7

This instrument is in compliance with IEC 60651 (2001-10) 6.1 and 9.2.2, ANSI S1.4-1983 5.1 and 8.2.1, and IEC 60804 (2001-10) 5.1 for Type 1 sound level meters when used with a Larson Davis Type 1 microphone.

Technician: Ron Harris Test Date: 29JAN2007

Larson Davis

A PCB Group Co.

Certificate of Calibration and Conformance

Certificate Number 2007-89313

Instrument Model 828, Serial Number 1853, was calibrated on 26JAN2007. The instrument meets factory specifications per Procedure D0001.8135.

Instrument found to be in calibration as received: YES
Date Calibrated: 26JAN2007
Calibration due: 26JAN2008

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0277 / 0109	12 Months	05APR2007	2006-78756
Hewlett Packard	34401A	US36015216	12 Months	27APR2007	289108

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 18 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Corporate Headquarters. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

This calibration complies with the requirements of ISO 17025 and ANSI Z540. The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"AS RECEIVED" data same as shipped data.

Signed: _____

Technician: Ron Harris

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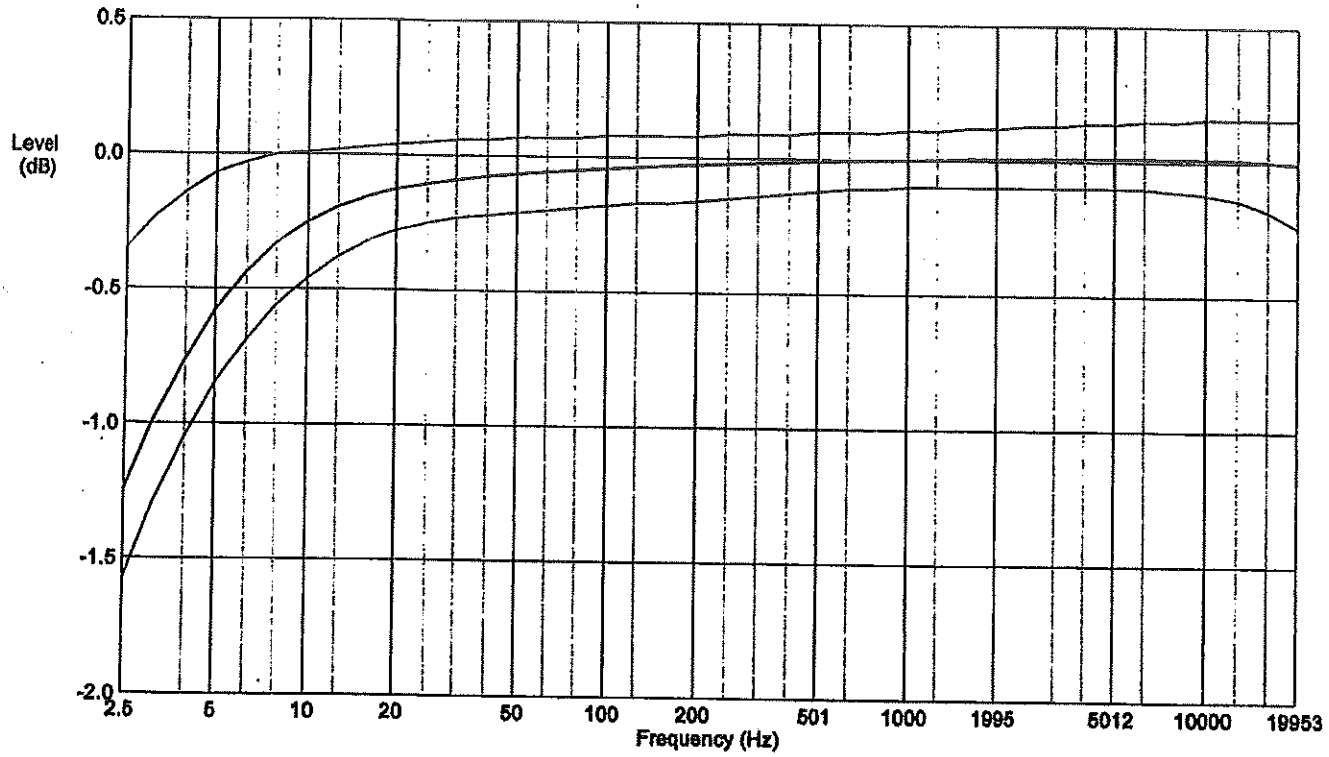
Preamplifier Model: 828 Serial Number: 1853
Certificate of Electrical Conformance

Frequency response of this model 828 preamplifier was tested at a level of 1 Vrms with 18pF microphone capacitance and driving a short cable. Output level at 1kHz is 0.8928 Vrms (-0.985 dBV), uncertainty 0.033 dB. Results are displayed relative to the level at 1kHz.



Freq (Hz)	Measured (dB)	Uncert (dB)	Tolerance (dB)
2.51	-1.25	0.075	-0.35, -1.58
3.16	-0.98	0.058	-0.23, -1.29
3.98	-0.76	0.058	-0.14, -1.05
5.01	-0.58	0.036	-0.07, -0.85
6.31	-0.44	0.036	-0.03, -0.69
7.94	-0.33	0.036	+0.00, -0.56
10.00	-0.25	0.016	+0.01, -0.46
12.59	-0.20	0.016	+0.02, -0.38
15.85	-0.16	0.016	+0.03, -0.32
19.95	-0.13	0.016	+0.04, -0.28
25.12	-0.11	0.016	+0.05, -0.25
31.62	-0.09	0.016	+0.06, -0.23
39.81	-0.08	0.016	+0.06, -0.22
50.12	-0.07	0.016	+0.07, -0.21
63.10	-0.06	0.016	+0.07, -0.20
79.43	-0.05	0.016	+0.07, -0.19
100.00	-0.04	0.016	+0.08, -0.18
125.89	-0.04	0.016	+0.08, -0.17
158.49	-0.03	0.016	+0.08, -0.17
199.53	-0.03	0.016	+0.08, -0.16
251.19	-0.02	0.016	+0.09, -0.15
316.23	-0.02	0.016	+0.09, -0.14
398.11	-0.01	0.016	+0.09, -0.13
501.19	-0.01	0.016	+0.10, -0.12
630.96	-0.00	0.016	+0.10, -0.11
794.33	-0.00	0.016	+0.10, -0.11
1000.00	0.00	0.016	+0.11, -0.10
1258.90	0.00	0.016	+0.11, -0.10
1584.90	0.01	0.016	+0.12, -0.10
1995.30	0.01	0.016	+0.12, -0.10
2511.90	0.01	0.016	+0.13, -0.10
3162.30	0.01	0.016	+0.13, -0.10
3981.10	0.01	0.016	+0.14, -0.10
5011.90	0.01	0.016	+0.14, -0.10
6309.60	0.01	0.016	+0.15, -0.10
7943.30	0.01	0.016	+0.15, -0.11
10000.00	0.01	0.016	+0.16, -0.12
12589.00	0.01	0.016	+0.16, -0.14
15849.00	0.00	0.016	+0.16, -0.18
19953.00	-0.00	0.016	+0.16, -0.24
25250.00	-0.02	0.022	n/a n/a
31500.00	-0.04	0.022	n/a n/a
39750.00	-0.08	0.022	n/a n/a
50000.00	-0.15	0.022	n/a n/a
63000.00	-0.28	0.047	n/a n/a
79500.00	-0.53	0.047	n/a n/a
100000.00	-1.07	0.047	n/a n/a
126000.00	-2.04	0.063	n/a n/a

Noise floor data: 1kHz (1/3 Octave) = 0.45 uV, -7.0 dBuV, uncertainty = 0.47 dB
Flat (20Hz-20kHz) = 4.0 uV, 12.1 dBuV, uncertainty = 0.47 dB
Awt = 2.0 uV, 6.1 dBuV, uncertainty = 0.46 dB

Uncertainties are given as expanded uncertainty at ~95% confidence interval (k = 2).

Technician: Ron Harris Test Date: 26JAN2007

~ *Certificate of Calibration and Compliance* ~

Microphone Model: 377B02 Serial Number: 105123 Manufacturer: PCB

Calibration Environmental Conditions

Environmental test conditions as printed on microphone calibration chart.

Reference Equipment

Manufacturer	Model #	Serial #	PCB Control #	Cal Date	Due Date
Hewlett Packard	34401A	MY41045214	LD-001	3/15/06	3/15/07
Larson Davis	PRM915	113	TA-470	2/2/07	2/2/08
Larson Davis	PRM902	2699	TA-468	2/2/07	2/2/08
Larson Davis	PRM916	104	LD-015	2/2/07	2/2/08
Larson Davis	CAL250	4147	LD-018	11/10/06	11/10/07
Larson Davis	2201	115	TA-472	2/13/07	2/13/08
Larson Davis	2900	664	CA-520	11/15/05	11/15/07
Larson Davis	PRA951-4	222	LD-026	8/16/06	8/16/07
Larson Davis	PRM902	2892	LD-004	3/20/06	3/20/07
Larson Davis	PRM902	2891	LD-003	3/20/06	3/20/07
Larson Davis	2559LF	3035	LD-005	3/20/06	3/20/07
Bruel & Kjaer	4192	2493415	LD-028	7/19/06	7/19/07
Larson Davis	ADP005	1	LD-017	3/15/05	3/15/07
Fisher Scientific	02-400	51253176	CA-897	8/3/06	8/3/07

Frequency sweep performed with B&K UA0033 electrostatic actuator.

Condition of Unit

As Found: N/A

As Left: New unit in tolerance

Notes

1. Calibration of reference microphone is traceable through PTB.
2. This certificate shall not be reproduced, except in full, without written approval from PCB Piezotronics, Inc.
3. Calibration is performed in compliance with ISO 9001, ISO 10012-1, ANSI/NCSL Z540-1-1994 and ISO 17025.
4. See Manufacturer's Specification Sheet for a detailed listing of performance specifications.
5. Open circuit sensitivity is measured using the insertion voltage method following procedure AT603-5.
6. Measurement uncertainty (95% confidence level with coverage factor of 2) for sensitivity is +/-0.20 dB.
7. A one-year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user.
8. Unit calibrated per ACS-20.

Technician: Nancy Szeluga NS Date: March 13, 2007

ACCREDITED
Cert No. 1942.01

PCB PIEZOTRONICS
VIBRATION DIVISION
3425 Walden Avenue, Depew, New York, 14043
TEL: 888-684-0013 FAX: 716-685-3886 www.pcb.com

ID:325650501.617

~ *Calibration Report* ~

Microphone Model: 377B02 Serial Number: 105123 Description: 1/2" Free-Field Microphone

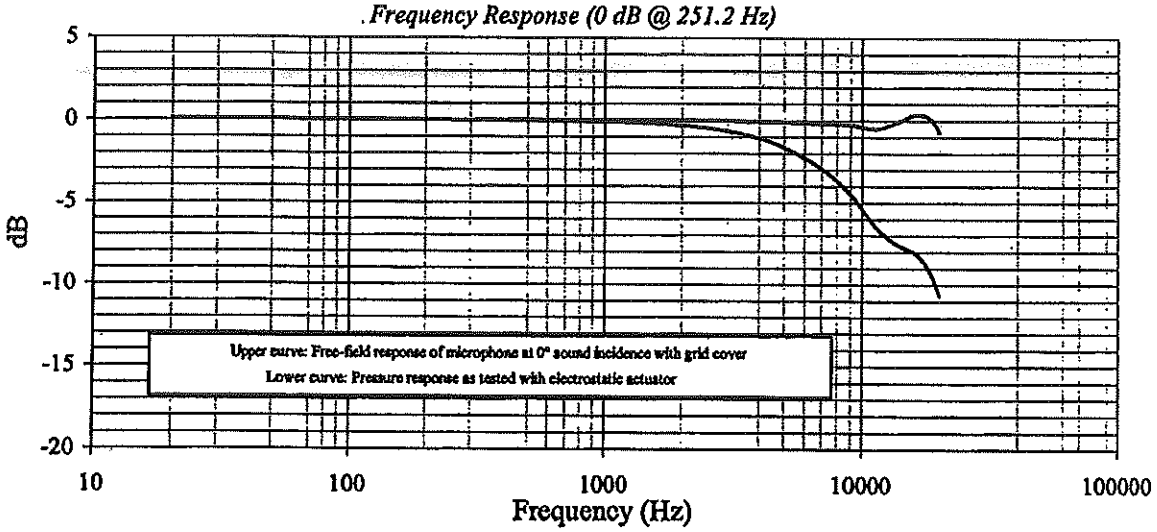
Calibration Data

Open Circuit Sensitivity @ 251.2 Hz: 51.73 mV/Pa
-25.73 dB re 1V/Pa

Polarization Voltage, External: 0 V
Capacitance: 11.9 pF

Temperature: 71 °F (22°C) Ambient Pressure: 988 mbar Relative Humidity: 37 %

Frequency Response (0 dB @ 251.2 Hz)



Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)	Freq (Hz)	Lower (dB)	Upper (dB)
20.0	0.06	0.06	1584.9	-0.21	0.00	6683.4	-2.71	-0.19	-	-	-
25.1	0.07	0.07	1678.8	-0.23	0.00	7079.5	-2.98	-0.20	-	-	-
31.6	0.06	0.06	1778.3	-0.25	0.00	7498.9	-3.29	-0.22	-	-	-
39.8	0.06	0.06	1883.7	-0.28	0.00	7943.3	-3.61	-0.22	-	-	-
50.1	0.05	0.05	1995.3	-0.31	0.00	8414.0	-3.97	-0.24	-	-	-
63.1	0.04	0.04	2113.5	-0.34	0.00	8912.5	-4.38	-0.27	-	-	-
79.4	0.04	0.04	2238.7	-0.37	0.00	9440.6	-4.83	-0.31	-	-	-
100.0	0.03	0.03	2371.4	-0.41	0.00	10000.0	-5.36	-0.41	-	-	-
125.9	0.02	0.02	2511.9	-0.46	0.00	10592.5	-5.89	-0.49	-	-	-
158.5	0.01	0.01	2660.7	-0.51	0.00	11220.2	-6.36	-0.50	-	-	-
199.5	0.01	0.01	2818.4	-0.57	-0.01	11885.0	-6.78	-0.46	-	-	-
251.2	0.00	0.00	2985.4	-0.63	-0.01	12589.3	-7.10	-0.33	-	-	-
316.2	-0.01	0.00	3162.3	-0.70	-0.02	13335.2	-7.40	-0.21	-	-	-
398.1	-0.02	-0.02	3349.7	-0.78	-0.04	14125.4	-7.63	-0.04	-	-	-
501.2	-0.03	0.01	3548.1	-0.87	-0.05	14962.4	-7.80	0.17	-	-	-
631.0	-0.05	-0.01	3758.4	-0.96	-0.06	15848.9	-8.00	0.35	-	-	-
794.3	-0.07	0.02	3981.1	-1.07	-0.07	16788.0	-8.38	0.34	-	-	-
1000.0	-0.10	0.02	4217.0	-1.18	-0.07	17782.8	-8.85	0.26	-	-	-
1059.3	-0.11	0.02	4466.8	-1.31	-0.08	18836.5	-9.57	-0.06	-	-	-
1122.0	-0.12	0.02	4731.5	-1.46	-0.09	19952.6	-10.65	-0.72	-	-	-
1188.5	-0.13	0.02	5011.9	-1.64	-0.11	-	-	-	-	-	-
1258.9	-0.14	0.02	5308.8	-1.84	-0.14	-	-	-	-	-	-
1333.5	-0.16	0.02	5623.4	-2.03	-0.15	-	-	-	-	-	-
1412.5	-0.17	0.02	5956.6	-2.23	-0.16	-	-	-	-	-	-
1496.2	-0.19	0.01	6309.6	-2.46	-0.17	-	-	-	-	-	-

Technician: Nancy Szeluga Date: March 13, 2007

ACCREDITED
Cert. No. 1862.01

PCB PIEZOTRONICS
VIBRATION DIVISION
3425 Walden Avenue, Depew, New York, 14043
TEL: 888-684-0013 FAX: 716-685-3886 www.pcb.com

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

SOUND ANALYZER & PREAMPLIFIER

Manufactured by:	**CEL INSTRUMENTS**
Model No:	**CEL-593.C1-CEL-527**
Serial No:	**3/0162197-3/1152208**
Calibration Recall No:	**16135**

Submitted By:

Customer:	**RICHARD LAMPETER**
Company:	**EPSILON ASSOCIATES, INC**
Address:	**3 CLOCK TOWER PLACE, SUITE 250**
	MAYNARD MA 01754

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. CEL-593.C CEL I

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2000 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Calibration Date: 02-Apr-07

Certificate No: 16135 - 1

Approved by:

Felix Christopher
Quality Manager

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ISO 9001:2000 Registered Company

Calibration Traceable To N. I. S. T.

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO 9001:2000 Registered Company

Calibration Traceable to N.I.S.T.

ACCREDITATION ISO/IEC 17025
1533.01

REPORT OF CALIBRATION

for

Cel Instruments Sound Analyzer & Preamplifier

Model No.: CEL-593.C1 / CEL-527 **Serial No.: 3/0162197 / 3/1162208**

Company : Epsilon Associates, Inc **I. D. No: XXXX**

Calibration results:

All tested parameters: Pass

For details see "Calibration Data Record"

Before data: ..... **After data: .....**
Before & after data same: ✓

Laboratory Environment:

Ambient Temperature:	20.8	°C
Ambient Humidity:	46.4	% RH
Ambient Pressure:	98.533	kPa
Calibration Date:	2-Apr-2007	2:16 PM
Re-calibration Due:	2-Apr-2008	
Report Number:	16135	-1
Control Number:	16135	

The above listed instrument meets or exceeds the tested manufacturer's specifications.

This Calibration is traceable through NIST test numbers listed below.

The expanded uncertainty of calibration: 0.16dB at 95% confidence level with a coverage factor of k=2.

The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 3.0 Nov. 12, 2003 Doc. # 1038 CEL593.C1CEL**

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2000, ISO 17025

NIST Traceable Instruments:			Date of Cal.	Traceability No.	Re-cal. Due Date
HP	34401A	S/N 3146A223	28-Aug-2006	,70913002	28-Aug-2007
HP	34401A	S/N 3146A585	28-Aug-2006	,70913002	28-Aug-2007
HP	33120A	S/N US360458	28-Aug-2006	,70913002	28-Aug-2007
Brüel & Kjær	4231	S/N 2308998	8-Aug-2006	822/270654-04	8-Aug-2007
Brüel & Kjær	4226	S/N 2220624	8-May-2006	822/272213-05	8-May-2007

Cal. Date: 2-Apr-2007 2:16 PM

Measurements performed by: .....
Stephen Johnson

Calibrated on WCCL system type 9700

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

Sound Level Analyser — Manufacturer: Cel Instruments
Microphone — Model No: CEL-593.C1 — S/N: 3/0162197
Preamplifier — Model No: 250 — S/N: 6259
Submitted by, — Model No: CEL -527 — S/N: 3/1152208
Company: Epsilon Associates, Inc.

Test	Function		Tolerance Min	Tolerance Max		Measured values Before	Out	Measured values After	Out
,0.	Reading with 94.0dB SPL		93.5	94.5		94.0		94.0	
,1.	Linearity accuracy								
		Range 70 to 130	69.5	70.5	70	70.0		70.0	
			79.5	80.5	80	80.0		80.0	
			89.5	90.5	90	90.0		90.0	
			99.5	100.5	100	100.0		100.0	
			109.5	110.5	110	110.0		110.0	
			119.5	120.5	120	120.0		120.0	
			129.5	130.5	130	130.0		130.0	
		Range 40 to 100	49.5	50.5	50	50.0		50.0	
			59.5	60.5	60	59.9		59.9	
			69.5	70.5	70	70.0		70.0	
			79.5	80.5	80	80.0		80.0	
			89.5	90.5	90	90.0		90.0	
			99.5	100.5	100	100.0		100.0	
			109.5	110.5	110	109.9		109.9	
		Range 10 to 70	19.5	20.5	20	20.5		20.5	
			29.5	30.5	30	30.0		30.0	
			39.5	40.5	40	39.9		39.9	
			49.5	50.5	50	49.9		49.9	
			59.5	60.5	60	59.9		59.9	
			69.5	70.5	70	69.9		69.9	
	Attenuator accuracy								
		Range 70 to 130	129.5	130.5		130.0		130.0	
		60 to 120	119.5	120.5		120.0		120.0	
		50 to 110	109.5	110.5		110.0		110.0	
		40 to 100	99.5	100.5		100.0		100.0	
		30 to 90	89.5	90.5		89.9		89.9	
		20 to 80	79.5	80.5		79.9		79.9	
		10 to 70	69.5	70.5		69.9		69.9	

Test	Function	Tolerance Min	Tolerance Max		Measured values Before	Out	After	Out
,2	Frequency Response			(Hz)				
	A Weighting	0.0	90.4	16000	85.2		85.2	
		83.7	92.7	12500	84.5		84.5	
		89.9	94.4	8000	94.4		94.4	
		94.0	96.0	4000	95.5		95.5	
		94.2	96.2	2000	95.3		95.3	
		93.0	95.0	1000	94.0		94.0	
		89.8	91.8	500	90.7		90.7	
		84.4	86.4	250	85.3		85.3	
		76.9	78.9	125	77.8		77.8	
		66.8	68.8	63	67.7		67.7	
		53.1	56.1	31.5	54.3		54.3	
	C Weighting	0.0	88.5	16000	83.3		83.3	
		81.8	90.8	12500	82.6		82.6	
		88.0	92.5	8000	92.5		92.5	
		92.2	94.2	4000	93.7		93.7	
		92.8	94.8	2000	94.0		94.0	
		93.0	95.0	1000	94.0		94.0	
		93.0	95.0	500	94.0		94.0	
		93.0	95.0	250	93.9		93.9	
		92.8	94.8	125	93.8		93.8	
		92.2	94.2	63	93.1		93.1	
		89.5	92.5	31.5	90.8		90.8	
	Lin.	0.0	97.0	16000	91.8		91.8	
		88.0	97.0	12500	88.8		88.8	
		91.0	95.5	8000	95.6		95.5	
		93.0	95.0	4000	94.5		94.5	
		93.0	95.0	2000	94.1		94.1	
		93.0	95.0	1000	94.0		94.0	
		93.0	95.0	500	93.9		93.9	
		93.0	95.0	250	93.9		93.9	
		93.0	95.0	125	93.9		93.9	
		93.0	95.0	63	93.9		93.9	
		92.5	95.5	31.5	93.8		93.8	
,3	Inherent noise level				Pass		Pass	
,4	Crest Factor	dB	dB					
		89.5	90.5	Fast	89.8		89.8	
		89.5	90.5	Slow	89.9		89.9	
,5	Time Constant	dB	dB					
		88.0	89.5	Fast	89.0		89.0	
		84.0	88.0	Slow	86.0		86.0	
	Functions							
	SPL	93.5	94.5		94.0		94.0	
	Leq	93.5	94.5		93.9		93.9	
	Max	93.5	94.5		94.0		94.0	
	Min	93.5	94.5		94.0		94.0	
	SEL	103.4	104.4		103.9		103.9	
	Peak	96.0	98.0		97.0		97.0	

Test Function 1/3 Octave Filter				
Filter Hz	85.0 to 93.5	93.5 to 94.5	85.0 to 93.5	Out
20	90.1	93.7	87.9	
25	91.1	93.8	87.1	
31.5	89.3	93.9	89.6	
40	90.3	93.9	88.1	
50	91.2	94.0	87.2	
63	89.4	93.9	89.5	
80	90.4	94.0	88.1	
100	91.3	94.0	87.2	
125	89.5	94.0	89.5	
160	90.4	94.0	88.1	
200	91.3	94.0	87.2	
250	89.5	94.0	89.5	
315	90.4	94.0	88.1	
400	91.3	94.0	87.2	
500	89.5	93.9	89.5	
630	90.4	94.0	88.1	
800	91.2	94.0	87.3	
1K	89.5	94.0	89.5	
1.25K	90.4	94.0	88.1	
1.6K	91.2	94.0	87.2	
2K	89.4	93.9	89.5	
2.5k	90.4	94.0	88.1	
3.15k	91.2	94.0	87.2	
4k	89.4	93.9	89.5	
5k	90.3	93.9	88.1	
6.3k	91.2	93.9	87.2	
8k	89.4	93.9	89.4	
10k	90.3	93.9	88.0	
12.5k	91.2	93.8	87.0	
16k	89.2	93.7	89.2	
20k	90.1	93.6	87.6	

Test Function 1/1 Octvae Filter				
Filter Hz	88.8 to 91.8	93.5 to 94.5	88.8 to 91.8	Out
31.5	90.4	93.9	91.1	
63	90.6	94.0	91.2	
125	90.7	94.0	91.2	
250	90.7	94.0	91.2	
500	90.7	94.0	91.2	
1K	90.6	94.0	91.2	
2K	90.6	94.0	91.2	
4k	90.6	94.0	91.1	
8k	90.6	93.9	91.0	
16k	90.5	93.8	90.7	

Measurements performed by:

Calibration Date: 2-Apr-07

Stephen Johnson

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE

Manufactured by:	CEL INSTRUMENTS
Model No:	CEL-250
Serial No:	6259
Calibration Recall No:	16135

Submitted By:

Customer:	RICHARD LAMPETER
Company:	EPSILON ASSOCIATES, INC
Address:	3 CLOCK TOWER PLACE, SUITE 250
	MAYNARD MA 01754

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. CEL-250 CEL I

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2000 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: 02-Apr-07

Certificate No: 16135 - 3

Felix Christopher
Quality Manager

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ISO 9001:2000 Registered Company
Calibration Traceable To N. I. S. T.

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor NY 14564

ISO 9001:2000 Registered Company

Calibration Traceable to N.I.S.T.

ACCREDITATION ISO/IEC 17025
ACCREDITED
1533.01

REPORT OF CALIBRATION

for

CEL Microphone Model No.: CEL250
Company : Epsilon Associates Inc.

Serial No.: 6259
I. D. No.: XXXX

Calibration results:

Open Circuit Sensitivity @ 250 Hz and pressure of 98.533 kPa
0 Volts Polarization voltage (External):
-26.96 dB re.1V/Pascal
44.85 mV/Pascal
0.96 Ko (- dB re 50 mV/Pascal)
Sensitivity: Pass
Freq. Response Pass
All tests: Pass

Before data: ..... After data: .....
Before & after data same: ...Y.....

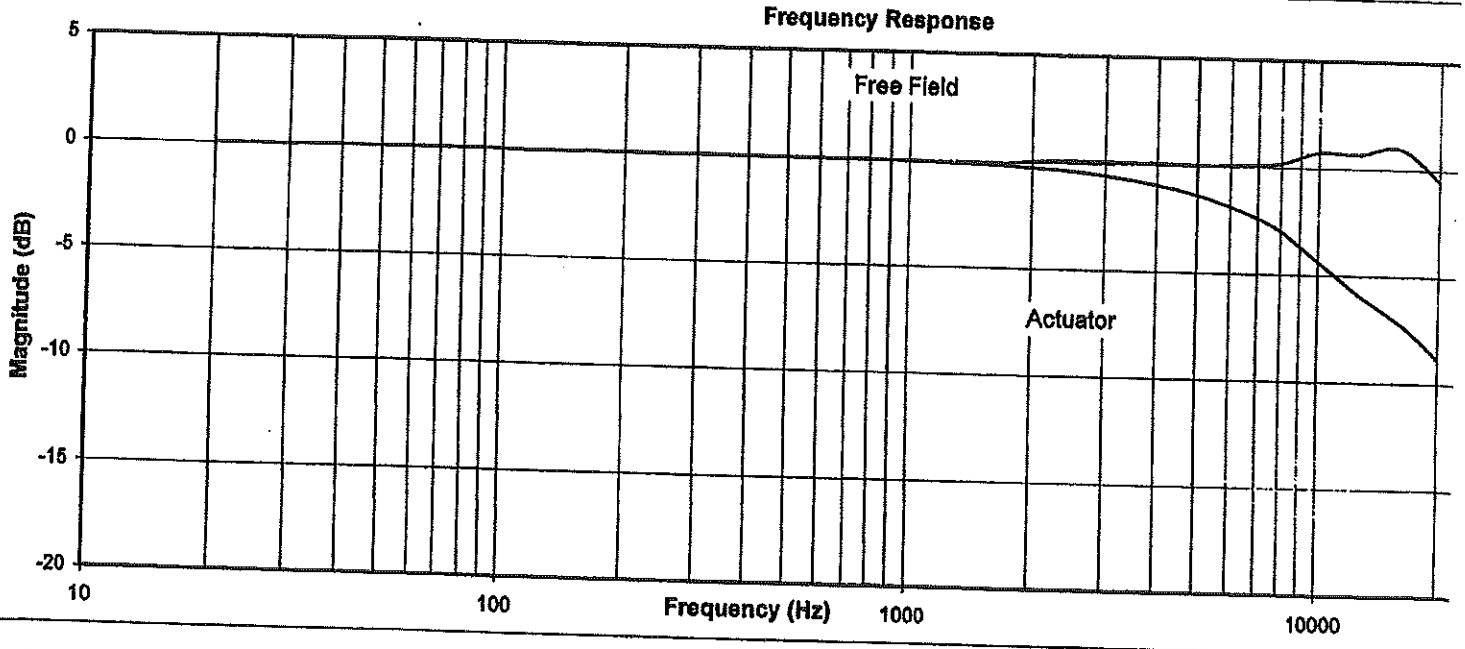
Ambient Temperature:	20.8	°C
Ambient Humidity:	46.4	% RH
Ambient Pressure:	98.53	kPa
Calibration Date:	2-Apr-2007	3:40 PM
Re-calibration Due:	2-Apr-2008	
Report Number:	16135 -3	
Control Number:	16135	

The above listed instrument meets or exceeds the tested manufacturer's specifications.

This Calibration is traceable through NIST test numbers: 822/274345-07

The expanded uncertainty of calibration: 0.16dB at 95% confidence level with a coverage factor of k=2.

The lower curve is the pressure response recorded with electrostatic actuator.



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 3.0 Nov. 12, 2003 Doc. # 1038 CEL250CEL**

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures Intended to Implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2000, ISO 17025

Calibrated on WCCL system type 9700

Measurements performed by: .....
Felix Christopher

West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564
Tel. (585) 586-3900 FAX (585) 586-4327

Calibration Data Record

for

CEL Microphone **Model No.: CEL250** **Serial No.: 6259**
I. D. No.: XXXX

Company : Epsilon Associates Inc.

Frequency Response (Reference = 0 dB @ 250Hz)

Frequency [Hz]	Actuator [dB]	Free Field (dB)	Frequency [Hz]	Actuator [dB]	Free Field (dB)
20.00	0.01	0.01	631.00	-0.02	-0.02
25.10	0.01	0.01	794.30	-0.04	-0.04
31.60	0.02	0.02	1000.00	-0.06	-0.06
39.80	0.03	0.03	1258.90	-0.10	-0.10
50.10	0.03	0.03	1584.90	-0.16	-0.14
63.10	0.03	0.03	1995.30	-0.25	0.04
79.40	0.03	0.03	2511.90	-0.39	0.11
100.00	0.05	0.05	3162.30	-0.61	0.09
125.90	0.00	0.00	3981.10	-0.93	0.07
158.50	0.03	0.03	5011.90	-1.38	0.02
199.50	0.02	0.02	6309.60	-2.04	0.06
251.20	0.00	0.00	7943.30	-2.93	0.17
316.20	0.01	0.01	10000.00	-4.37	0.73
398.10	0.00	0.00	12589.30	-5.88	0.67
501.20	-0.01	-0.01	15848.90	-7.11	0.99
			19952.60	-8.61	-0.51

Instruments used for calibration:				Date of Cal.	Traceablity No.	Re-cal. Due Date
Brüel & Kjær	4134	S/N	1222616	12-Jan-2007	822/274345-07	12-Jan-2008
HP	33120A	S/N	S3604371	28-Aug-2006	,70913002	28-Aug-2007
Brüel & Kjær	2636	S/N	1324082	5-Apr-2006	822/272213-05	5-Apr-2007
HP	34401A	S/N	US360641	28-Aug-2006	,70913002	28-Aug-2007
Brüel & Kjær	2669	S/N	2148476	9-May-2006	822/272213-05	9-May-2007
Brüel & Kjær	4228	S/N	1742061	12-Sep-2006	822/272213-05	12-Sep-2007
HP	34401A	S/N	US361024	28-Aug-2006	,70913002	28-Aug-2007

Cal. Date: 2-Apr-2007 3:40 PM **Tested by: Felix Christopher**

Calibrated on WCCL system type 9700

Comments Submitted

4/14/10

CIVIL
CONSULTANTS

Engineers
Planners
Surveyors
PO. Box 700
293 Main Street
South Berwick
Maine
03908
207-384-2550

April 1, 2010

Mr. Rick Knowland - Portland Planning Director
Department of Planning and Development
389 Congress Street
Portland, ME 04101

568 Riverside
2008-0014 CA
321-A-1

Re: PNE Scrap Facility – Changes to Approved Site Plan

Dear Rick:

As you know, Prolerized New England Company, LLC (PNE) received Site Plan Approval on July 8, 2008 for a new scrap metal recycling facility on Riverside Street in Portland, Maine. On November 12, 2009 the Portland Planning Authority approved revisions to the record site plans, generated during the preparation of construction documents.

DEPT. OF BUILDING INSPECTION
CITY OF PORTLAND, ME
APR 14 2010
RECEIVED

Due to changes in the scrap metal market that occurred in 2009, PNE is making adjustments to both their business model and the proposed facility. As a result, PNE is submitting additional changes to the site plans, for City review and approval, prior to the startup of 2010 construction.

The following summary of changes is presented to assist the City with their review:

1. The Process Building has been shortened 5 feet and is now 60' by 175'. This building will be constructed in 2010. The higher 80' by 100' Bailer Building wing will not be constructed in 2010, but may be added at a future date.
2. A 25' by 60' Car Processing area will be constructed on the north end of the building. It will be covered by continuing the building roofline. It will have walls on four sides, with a 25' by 16' opening on the end.
3. The Process Building location has been shifted 33' West and 10' north of the approved location. The finish floor has been lowered 1 foot.
4. Outside storage bins will not be constructed in 2010. They may be added at some future date.
5. The Flat Auto Building will not be constructed in 2010. Utility conduits will be installed from the process building to the location, to allow it to be added in the future.
6. The configuration of the screening berm has changed to accommodate additional volume of on-site soils that may not be used as fill and to reflect the postponement of storage bin construction.

2 sided

7. The bituminous pavement area has been reduced from 2.3 to 1.3 acres.
8. Chain link fence has been moved away from Riverside Street to enclose only the building and process areas. The 60' wide sliding gate is now parallel with the building.
9. The entrance lanes will still provide over 800 feet of vehicle storage, to comply with the City conditions.
10. Storm drains at the entrance drive and bioswale Pond 51 have been redesigned to tie into the existing 18-inch City drain and eliminate redundant pipe systems.
11. The loading dock, west side roof drains and footing drains have been designed to tie into the existing 18-inch HDPE drain, which discharges into the existing detention basin at the bottom of the south embankment. The remainder of the processing area will drain to the new stormwater treatment system as originally designed and approved. This will allow the stormwater treatment system to be more effective in treating only the runoff from the scrap storage areas and allow "clean runoff" to bypass the system.
12. Landscaping materials have been adjusted to work with the revised screening berm, building and paved areas. Refer to drawing LA-2 for the revised design.
13. Power and telephone service will be installed above ground from Riverside Street to the proposed entrance gate. Then the utilities will be installed underground from the gate to the building. All on-site lighting wiring will be installed underground.

The remaining information on the construction drawings is identical to the plans approved by the Portland Planning Board and the City Council. Please contact me with any questions or comments during your review of this information, so that construction may commence in April 2010.

Sincerely,

CIVIL CONSULTANTS
Carl V. Beal, P.E.
cc: file, Hope Jacobsen, Esq., Ben Ghiringhelli, Frank LaRosa,
J:\aaa\2006\0676902\PDF's\20100401CityPlanChanges\20100401RickKnowlandPlanChangesLtr.doc