RSG INC.
RESOURCE SYSTEMS GROUP, INC.

MEMORANDUM

To:	Andy Novey
From:	Isaac Old
Subject:	Updated Canton Wind Farm Modeling
Date:	June 21, 2012

At your request, we have remodeled wind turbine sound from the Canton Mountain Wind Farm, reflecting plans to reduce the turbine hub height of the proposed Siemens SWT 3.0-113 from 90 meters to 79.5 meters. This memo is a supplement to RSG's reports entitled *Noise Modeling Study for Canton Wind Farm: Canton, Maine* dated March 2012 and *Addendum: Siemens SWT 3.0-113 Sound Modeling Results for Canton Mountain Wind* dated May 18, 2012. Included are:

- A description of the different scenarios run,
- A description of sound propagation modeling methodology, and
- Sound propagation modeling results.

MODELING SCENARIOS

Two different scenarios were run. Both scenarios were run with identical parameters except for hub height. The first hub height is 90 meters, the height modeled for the May 2012 Addendum and the second is the currently proposed hub height of 79.5 meters. As in the May 2012 Addendum, the Siemens SWT 3.0-113 turbine is modeled in all cases.

MODELING PARAMETERS

Modeling was completed for the project using Cadna A's implementation of the ISO 9613-2 acoustical modeling protocol, using the same parameters and receiver grid as the March 2012 report and May 2012 Addendum.

The turbine sound power used for modeling is shown in Table 1 along with the sound power of the two transformers that will be located in a substation just southwest of the project. These sound power levels have not changed.

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Table 1: Spectral Sound Power Levels (dBA)

Sound Source	Nominal Sound Power (dBA)	1/1 Octave Band Center Frequency (Hz)								
		31.5	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*8000*
Siemens SWT 3.0-113 at 8 m/s	106	n/a	84	89	99	100	100	90	92	75
Transformer	93	35	52	90	81	86	86	75	68	55

MODELING RESULTS

Results for the 90 meter and 79.5 meter hub heights are shown in Figure 1 and Figure 2 respectively.

The difference in modeled sound levels between the 90 meter and 79.5 meter hub height turbines is small, ranging from 0.2 dB higher for the 79.5 meter hub height turbines to 0.7 dB higher for the 90 meter hub height. The highest modeled sound level within a 500-foot buffer from non-participating residences remains below 45 dBA.

CONCLUSIONS

Sound propagation modeling was completed for the proposed Canton Mountain Wind Farm to compare modeling results using the previously proposed 90 meter hub height Siemens SWT 3.0-113 turbine and the currently proposed 79.5 meter hub height Siemens SWT 3.0-113 turbine. This memo is a supplement to RSG's March 2012 report entitled *Noise Modeling Study for Canton Wind Farm: Canton, Maine* dated March 2012 and *Addendum: Siemens SWT 3.0-113 Sound Modeling Results for Canton Mountain Wind* dated May 18, 2012. Results are as follows:

- ISO 9613-2 sound propagation modeling was completed for the Siemens SWT 3.0-113 turbine at two different hub heights, 90 meters and 79.5 meters.
- The model results show little change in the maximum sound levels. As with previous modeling, the Chapter 375 standards are not exceeded.

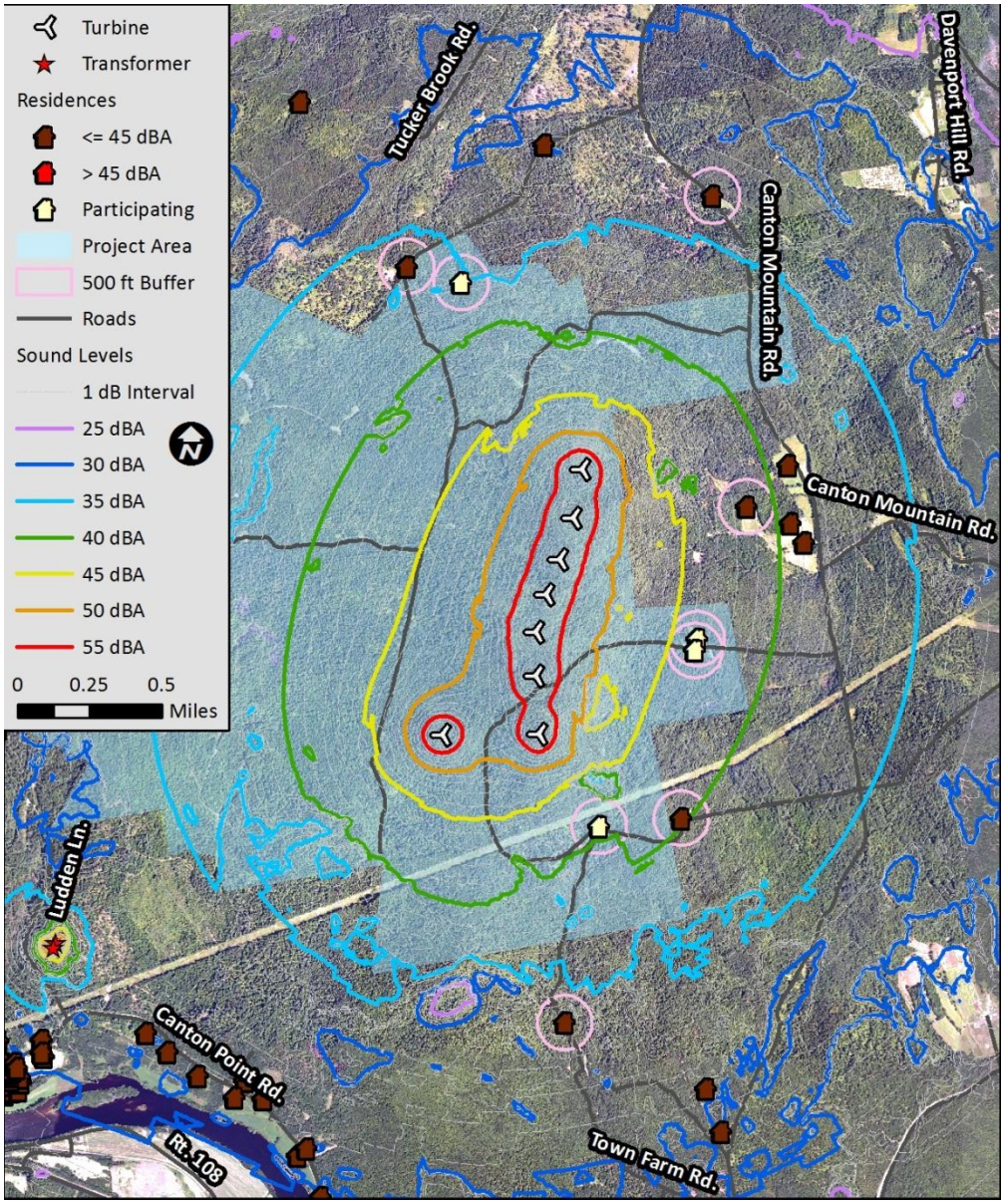

Figure 1: Modeling Results with 90 meter Hub Height Turbine

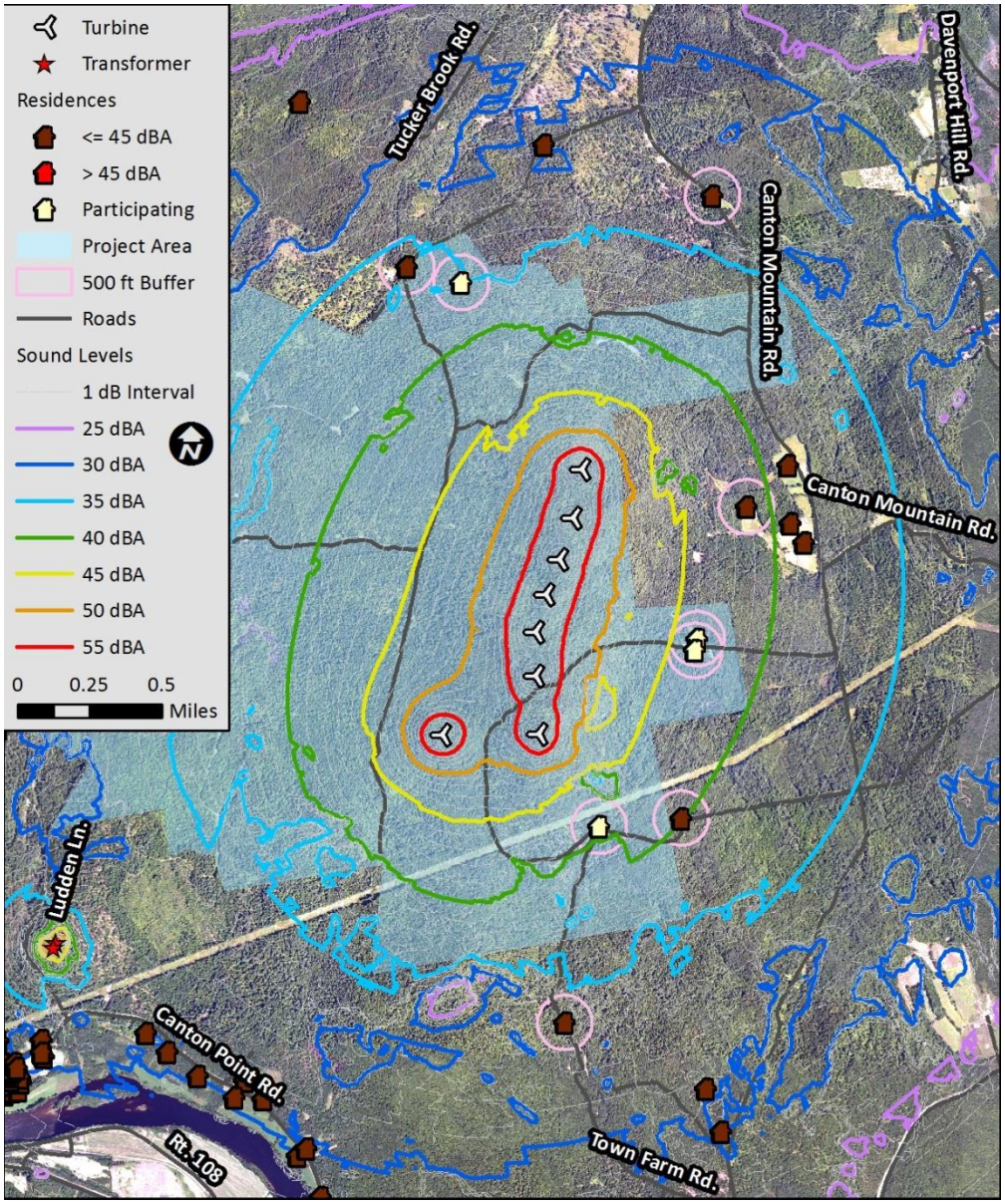

Figure 2: Modeling Results with 79.5 meter Hub Height Turbine

APPENDIX A: SOURCE AND RECEIVER INFORMATION

Table A1: Sound Source Information

Source ID	Modeled Sound Power (dBA)	Nominal Turbine Sound Power (dB)	Source Height (m)	Coordinates at Source Height (UTM NAD83 Z19N)		
				X (m)	Y (m)	Z (m)
T1	109.5	106	90	396625	4930556	545
T2	109.5	106	90	396576	4930287	551
T3	109.5	106	90	396500	4930057	555
T4	109.5	106	90	396425	4929860	555
T5	109.5	106	90	396364	4929651	544
T6	109.5	106	90	396365	4929406	550
T7	109.5	106	90	396382	4929083	560
T8	109.5	106	90	395844	4929075	495
Transformer - Canton Mountain Wind Project	93	93	3	393699	4927916	168
Transformer - Saddleback Ridge Wind Project	93	93	3	393683	4927887	166

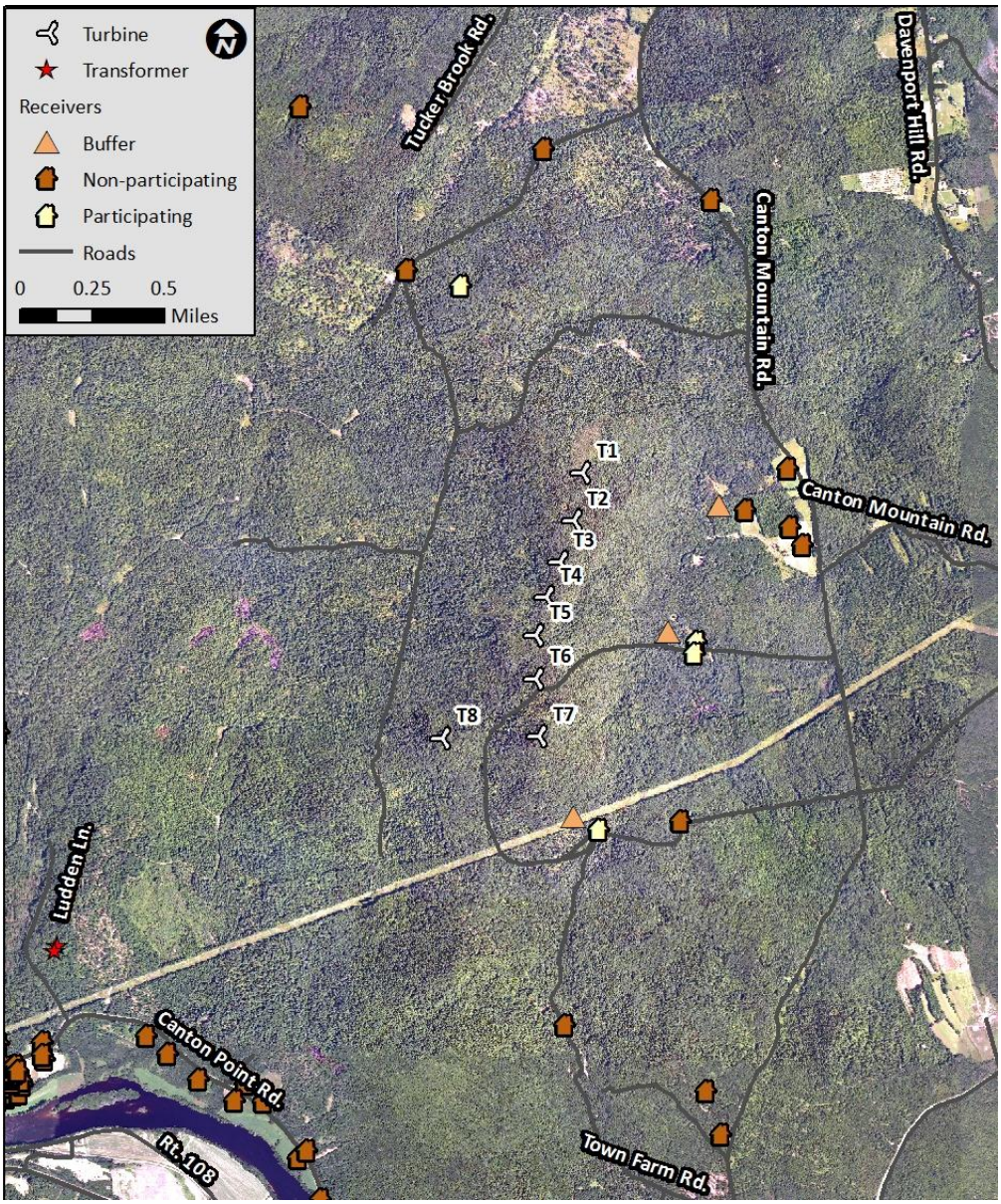

Figure A1: Turbine Locations

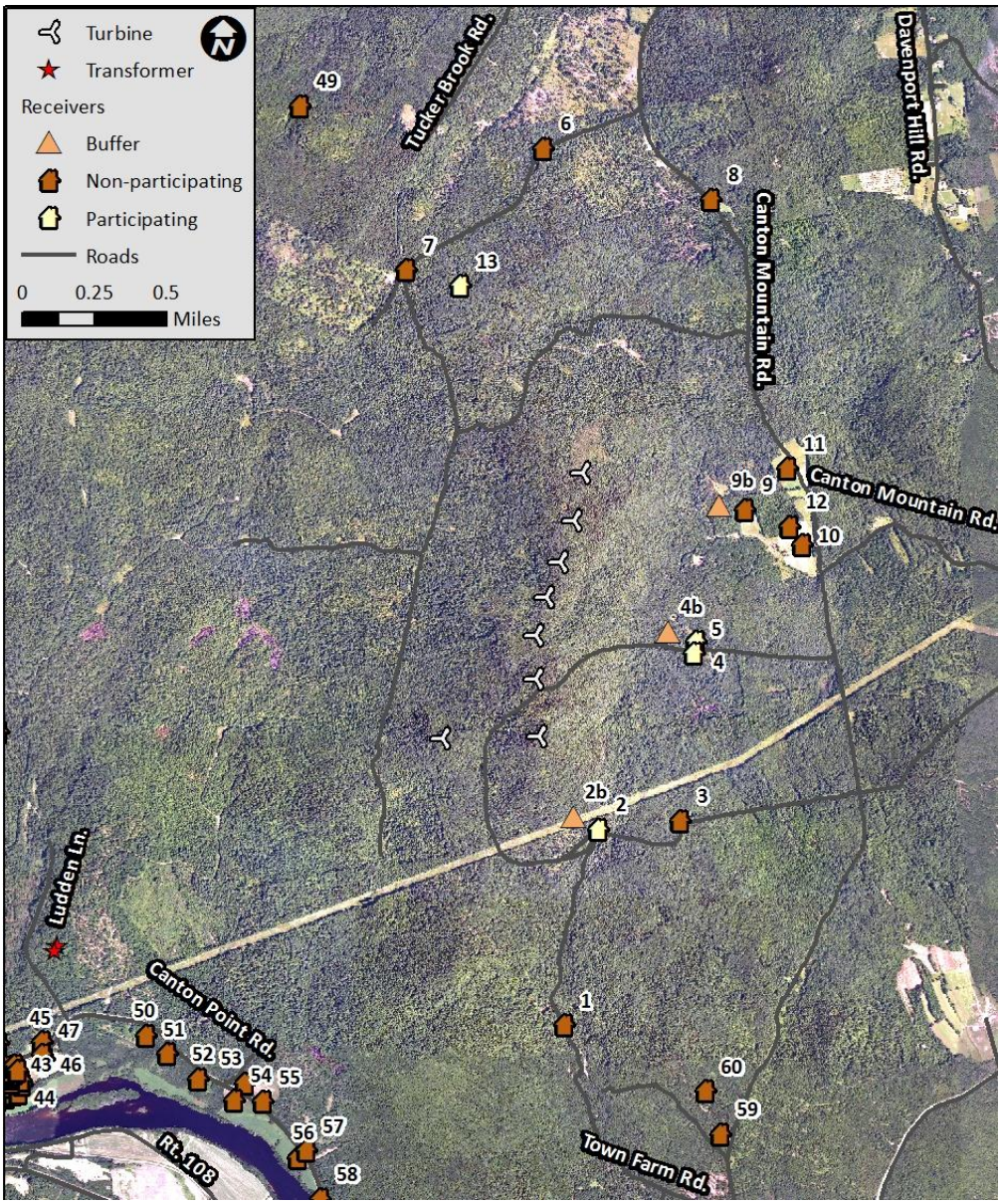

Figure A2: Receiver Locations

Table A2: Modeling Results

Receiver ID	Status	Sound Pressure Level (dBA)		Relative Height (m)	Coordinates (NAD83 Z19N)		
		90 m	79.5 m		X (m)	Y (m)	Z (m)
1	Non-participating	35	35	4	396535	4927470	192
2	Participating	42	42	4	396726	4928565	290
3	Non-participating	42	42	4	397183	4928611	279
4	Participating	45	45	4	397273	4929612	271
5	Participating	45	45	4	397261	4929546	270
6	Non-participating	32	32	4	396419	4932369	280
7	Non-participating	38	38	4	395653	4931689	350
8	Non-participating	36	35	4	397358	4932082	279
9	Non-participating	43	43	4	397547	4930349	241
10	Non-participating	40	41	4	397867	4930150	226
11	Non-participating	41	41	4	397782	4930579	238
12	Non-participating	41	41	4	397793	4930254	230
13	Participating	38	38	4	395957	4931599	364
14	Non-participating	21	21	4	392501	4926924	146
16	Non-participating	28	28	4	392817	4927103	143
17	Non-participating	27	27	4	392918	4927107	141
18	Non-participating	29	29	4	393117	4927231	143
19	Non-participating	30	30	4	393238	4927258	139
20	Non-participating	29	29	4	393311	4927258	139
21	Non-participating	32	32	4	393377	4927368	144
22	Non-participating	31	31	4	393379	4927211	140
23	Non-participating	30	30	4	393338	4927199	139
24	Non-participating	31	31	4	393343	4927181	139
25	Non-participating	31	31	4	393381	4927185	139
26	Non-participating	31	31	4	393350	4927160	139
27	Non-participating	31	31	4	393397	4927143	139
28	Non-participating	31	31	4	393352	4927132	139
29	Non-participating	31	31	4	393418	4927105	137
30	Non-participating	30	30	4	393357	4927069	136
31	Non-participating	31	31	4	393414	4927068	135

Receiver ID	Status	Sound Pressure Level (dBA)		Relative Height (m)	Coordinates (NAD83 Z19N)		
		90 m	79.5 m		X (m)	Y (m)	Z (m)
32	Non-participating	30	30	4	393366	4927048	134
33	Non-participating	31	31	4	393455	4927087	135
34	Non-participating	31	31	4	393449	4927126	137
35	Non-participating	30	31	4	393487	4927093	133
36	Non-participating	31	31	4	393503	4927139	136
37	Non-participating	31	31	4	393496	4927162	137
38	Non-participating	31	31	4	393446	4927149	138
39	Non-participating	31	31	4	393442	4927173	139
40	Non-participating	31	31	4	393432	4927191	139
41	Non-participating	31	32	4	393421	4927210	140
42	Non-participating	32	32	4	393411	4927239	141
43	Non-participating	32	32	4	393464	4927244	139
44	Non-participating	32	32	4	393479	4927218	139
45	Non-participating	32	32	4	393615	4927374	139
46	Non-participating	32	32	4	393630	4927281	137
47	Non-participating	32	33	4	393618	4927302	138
48	Non-participating	32	32	4	393376	4929110	159
49	Non-participating	26	26	4	395060	4932606	309
50	Non-participating	33	33	4	394198	4927414	131
51	Non-participating	32	32	4	394320	4927308	134
52	Non-participating	32	32	4	394490	4927171	134
53	Non-participating	32	32	4	394750	4927147	128
54	Non-participating	32	32	4	394693	4927051	126
55	Non-participating	32	32	4	394853	4927042	129
56	Non-participating	32	32	4	395044	4926729	126
57	Non-participating	32	32	4	395093	4926769	129
58	Non-participating	30	30	4	395172	4926499	127
59	Non-participating	32	32	4	397407	4926861	163
60	Non-participating	33	33	4	397324	4927102	192
2b	Participating Buffer	43	43	1.5	396587	4928636	334
4b	Participating	45	45	1.5	397112	4929664	280

Receiver ID	Status	Sound Pressure Level (dBA)		Relative Height (m)	Coordinates (NAD83 Z19N)		
		90 m	79.5 m		X (m)	Y (m)	Z (m)
	Buffer						
9b	Non-Participating Buffer	43	43	1.5	397396	4930372	247