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January 27, 2012

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

BELL BEND NUCLEAR POWER PLANT
COLA PART 3 (ENVIRONMENTAL REPORT)
ENVIRONMENTAL NOISE SURVEY AND COOLING TOWER SOUND EMISSIONS
BNP-2012-030 Docket No. 52-039

Reference BNP-2011-230, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "Bell Bend Nuclear Power Plant COLA Part 3 (Environmental Report) Update to Reflect Site Footprint Relocation," dated December 19, 2011

In the referenced letter, PPL Bell Bend, LLC (PPL) provided the NRC with the Bell Bend Nuclear Power Plant (BBNPP) Combined Operating License Application (COLA) Part 3 Environmental Report (ER) Update reflecting the relocation of the BBNPP footprint within the existing project boundary. The NRC requested that PPL provide any environmental noise surveys which supported the referenced document.

This letter transmits "2010 Baseline Environmental Noise Survey, Supplement to HAI Reports 041808-1 & 062608-1," and "Report Number 080108-1 Estimated Cooling Tower Sound Emissions" updated subsequent to Revision 2 of the BBNPP COLA Part 3 ER. The environmental noise survey update and estimated cooling tower sound emission results will be included in Part 11L of the next revision of the BBNPP COLA.

The updated noise surveys effected changes to the following sections and table of the BBNPP COLA Part 3 ER:

Section 2.7.7
Section 4.3.1
Section 4.4.1
Section 5.3.4
Section 5.8.1
Section 5.10
Table 10.5-1

The enclosures provide the updated environmental noise study and estimated cooling tower sound emissions report.

D102
NRO

Should you have questions, please contact the undersigned at 610.774.7552.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 27, 2012

Respectfully,

Rocco R. Sgarro

RRS/kw

Enclosures: 1) 2010 Baseline Environmental Noise Survey, Supplement to HAI Reports 041808-1 & 062608-1
2) Report Number 080108-1 Estimated Cooling Tower Sound Emissions

cc: (w/ Enclosures)

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Enclosure 1

2010 Baseline Environmental Noise Survey, Supplement to HAI Reports 041808-1 & 062608-1

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38-7007745-001

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TECHNICAL MEMO

Title:	**2010 BASELINE ENVIRONMENTAL NOISE SURVEY, SUPPLEMENT TO HAI REPORTS 041808-1 & 062608-1**
Project:	**BELL BEND NUCLEAR POWER PLANT (BBNPP)**
Location:	**Berwick, PA**
Prepared For:	**AREVA NP, Inc.**
Prepared By:	**George F. Hessler, P.E.**
Revision:	**0**
Issue Date:	**July 27, 2010**
Reference No:	**TM-072710-1**
Attachments:	**None**

Attn. Mr. P. Gluckler

Introduction

This suplement adds additional measured data to the subject reports and forms an integral addition to each report. Since the ambient or existing noise surveys were completed in 2008, the plant design has shifted the hyperbolic cooling towers approximately 900 feet northwards. The 2008 survey had no receptor measurement points to the north, so for due diligence, two new receptor locations were measured north of the plant. Additionally, measurements were repeated at location 2 of the existing survey. The survey locations are shown in Figure 1 and results are given herein.

Test Methodology

All methods, instrumentation, calibration, etc. were repeated as described in the original surveys, except larger 7 inch diameter windscreens were utilized in lieu of smaller standard manufacturers units. Larger wind screens improve two areas[1] for more accurate results. One, there is less false wind induced signal input, and two, the larger screens have significant attenuation at the very high frequencies where insect noise is prevalent and act as a filter. It can be shown that use of larger windscreens can lower measured results at any given location in the range of 0 to 4 dBA as opposed to smaller windscreens.

Meteorological conditions

[1] Hessler, et al, "Experimental study to determine wind-induced noise and windscreen attenuation effects on microphone response for environmental wind turbine and other applications", Noise Control Engineering Journal, 56(4), July-Aug 2008

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Meteorological conditions for environmental noise measurements were stable and ideal with essentially no rainfall or high winds during the two week "hot summer" survey period. There were no observed construction activities and PPL SSES plants 1 and 2 were operating. Such ideal conditions lead to minimum measured levels.

Test locations for all measurements are shown on the following Figure 1. The original survey locations in 2008 are labeled 1 thru 5 and 2', 6' and 7' for this survey in 2010.

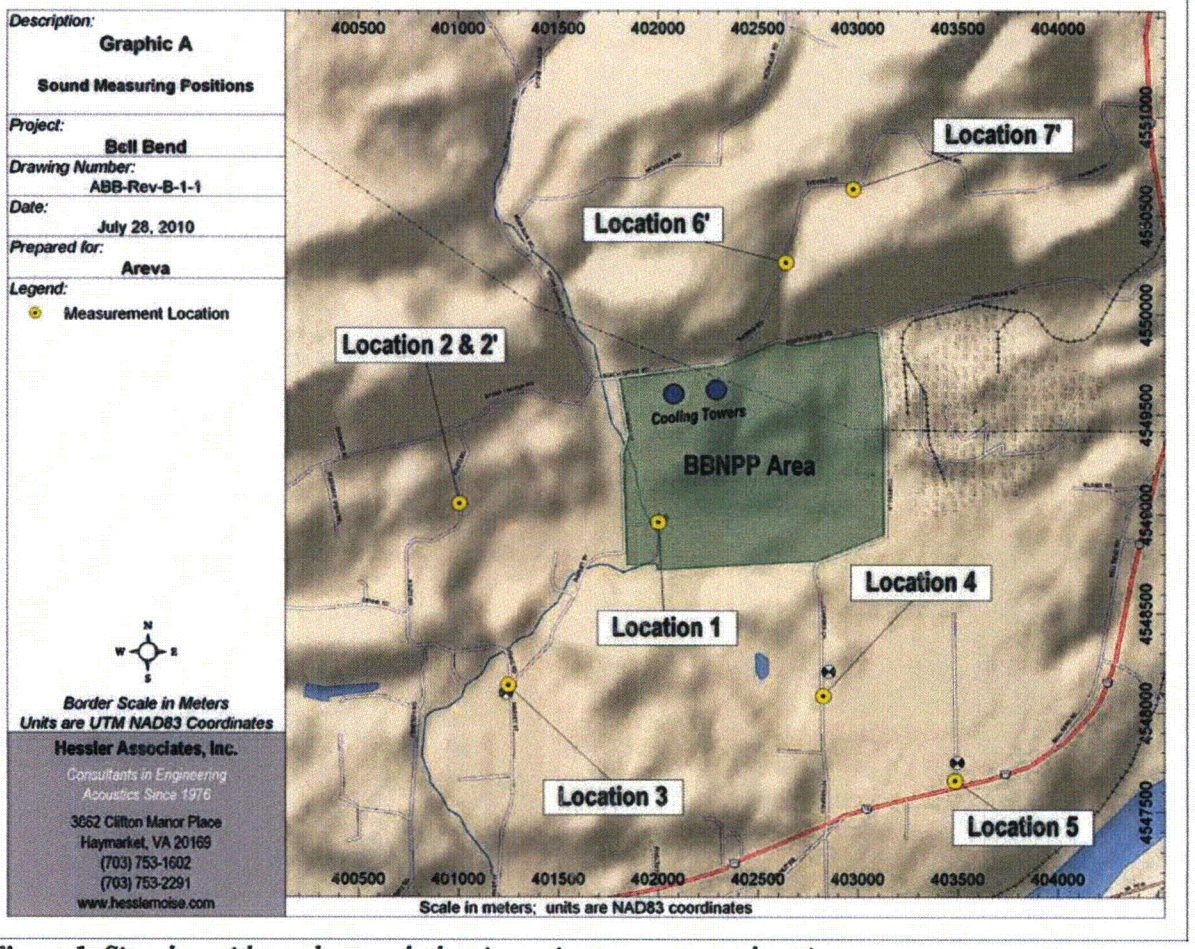

***Figure 1:** Site plan with road network showing noise measurement locations.*

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Results

The following Table tabulates the principle results at the three locations.

2010 LEAF-ON SURVEY															
	DATE AND DAY OF WEEK														AVERAGE
LOCATION	15-Jun TUE	16-Jun WEB	17-Jun THU	18-Jun FRI	19-Jun SAT	20-Jun SUN	21-Jun MON	22-Jun TUE	23-Jun WEB	24-Jun THU	25-Jun FRI	26-Jun SAT	27-Jun SUN	28-Jun MON	DAILY MINIMUM HOURLY LEVEL
	LA50 METRIC MINIMUM HOUR MEASUREMENT														
2'	27.5	29.1	26.3	27.1	28.8	26.7	29.8	31.8	26.7	29.4	25.1	31.7			**28**
6'	24.9	28.2	25.2	27.3	29.3	23.3	25.0	26.9	22.7	24.5	21.9	27.2	26.9	24.8	**26**
7'	24.0	31.8	25.4	25.1	28.3	24.4	23.8	25.0	23.0	26.8	21.1	27.3	22.3	28.9	**26**
	LA90 METRIC MINIMUM HOUR MEASUREMENT														
2'	25.5	29.1	26.3	25.2	27.1	23.6	26.6	30.1	23.5	26.7	21.4	29.1			**26**
6'	23.6	26.9	23.5	25.2	26.3	22.2	23.9	24.2	21.5	22.3	20.5	24.7	25.6	23.3	**24**
7'	22.0	26.5	24.1	22.6	25.9	22.3	20.8	22.8	21.3	25.2	19.4	24.5	21.2	24.9	**23**
	LAeq METRIC MINIMUM HOUR MEASUREMENT														
2'	29.2	29.8	28.0	28.3	31.3	30.6	30.4	33.6	27.5	31.1	27.1	33.6			**30**
6'	25.8	28.7	33.2	27.5	32.0	24.4	25.2	28.4	23.5	25.4	22.7	29.0	36.4	28.1	**28**
7'	25.9	32.9	28.4	26.4	28.8	30.0	24.9	25.8	23.9	30.0	22.3	28.6	27.2	30.3	**28**
	Ldn OR DNL 24 HOUR MEASURE														
2'	49.2	48.3	48.0	48.1	48.8	46.7	48.4	48.3	46.8	48.3	47.8	47.8			**48**
6'	49.0	49.4	47.6	48.8	49.2	47.7	46.6	47.3	47.4	49.0	49.0	54.2	54.2	50.1	**49**
7'	59.8	53.7	55.9	50.7	58.6	60.0	54.8	55.8	47.8	46.0	42.0	44.4	46.6	52.0	**52**

AVG. WIND, MPH	1.8	1.4	3.5	0.8	1.4	2.1	1.5	0.5	1.6	3	1.7	1.1	1.1	1.9
PERCIPITATION, IN.	0	0.5	0	0	0	0	0	0.03	0.02	0.02	0	0	0.16	0.38

Table 1: *Minimum hourly and 24-hour Day/Night Sound Levels for a 14 Day Sampling Period during Leaf-on Seasonal Conditions at the Proposed Bell Bend BBNPP3 Project*

Graphic displays of the various measured metrics are given in the following plots. The meaning of each metric is explained in detail in the basic reports.

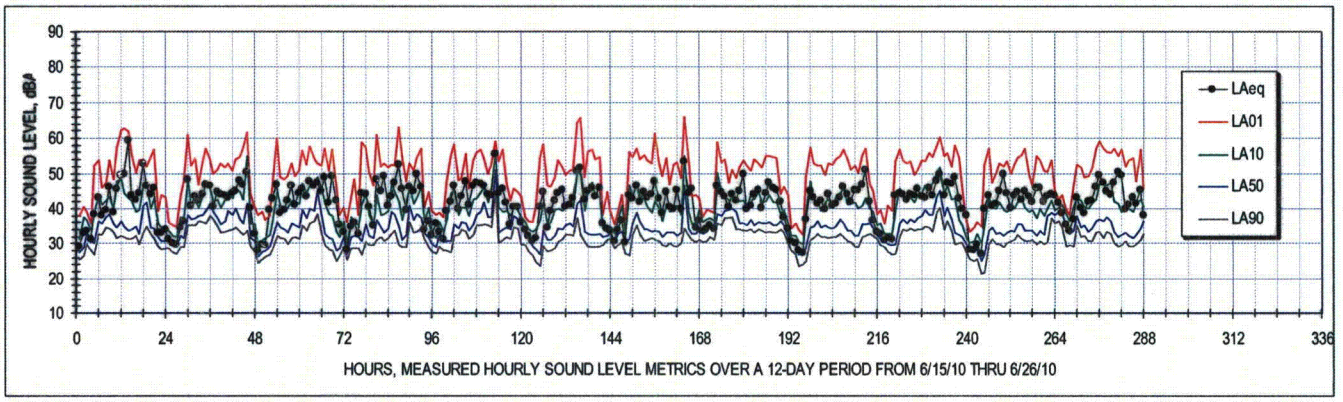

Figure 2: *Measured hourly noise metrics over a 12 day period at location 2'.*

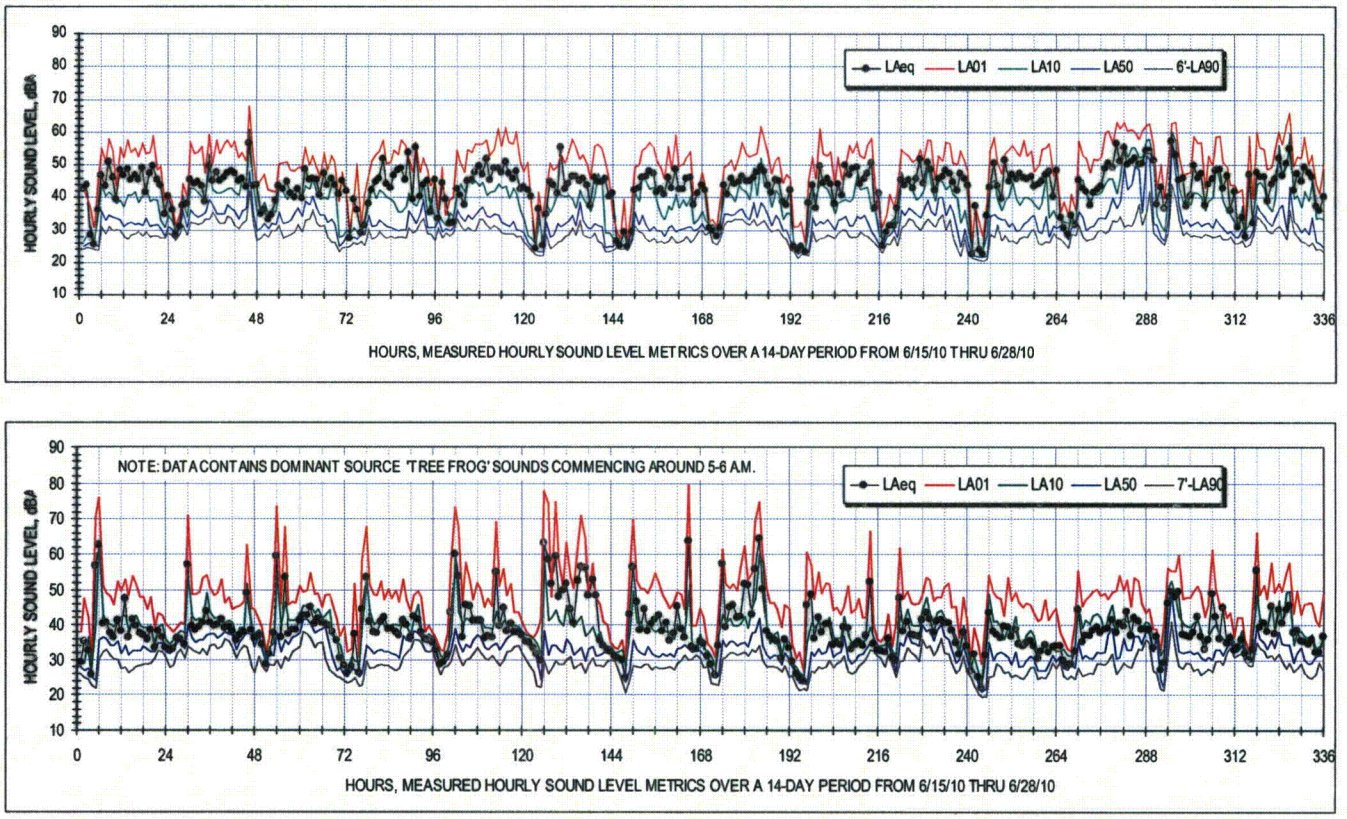

Figure 3: *Measured hourly noise metrics over a 14 day period at locations 6'above and 7'below.*

Discussion

The measured results in Table 1 are summarized in terms of the arithmetic average of the daily minimum hour metrics LA50, LA90 and LAeq. In addition, the 24 hour metric, Ldn or DNL (Level, day/night or Day Night Level) is averaged over the survey period. These four metrics are the most commonly used for environmental noise assessments to define "Existing Conditions".

Comparison of the graphic hourly plot shows an unusual pattern at location 7'. At first glance, the spikes or sharp peaks at 5 or 6 a.m. could be attributed to commuter traffic, except location 6' on the same road does not exhibit the early morning peaks and the peaks occur every day including weekends. It turns out to be the nocturnal pattern of tree frogs and insects at this location as can be illustrated by frequency analysis of the data.

Figure 4 below plots the hourly frequency spectra (Leq energy average) for the hours from 2 a.m. thru 8 a.m. at location 7'. Note there was no significant insect activity until the 5-6 a.m. hour. Notice the A-weighted level increases over 25 dBA when tree frogs become active! This occurs because high frequencies control the A-weighted sound level. While the spectra are true, the high A-weighted levels provide no sound masking of power plant noise.

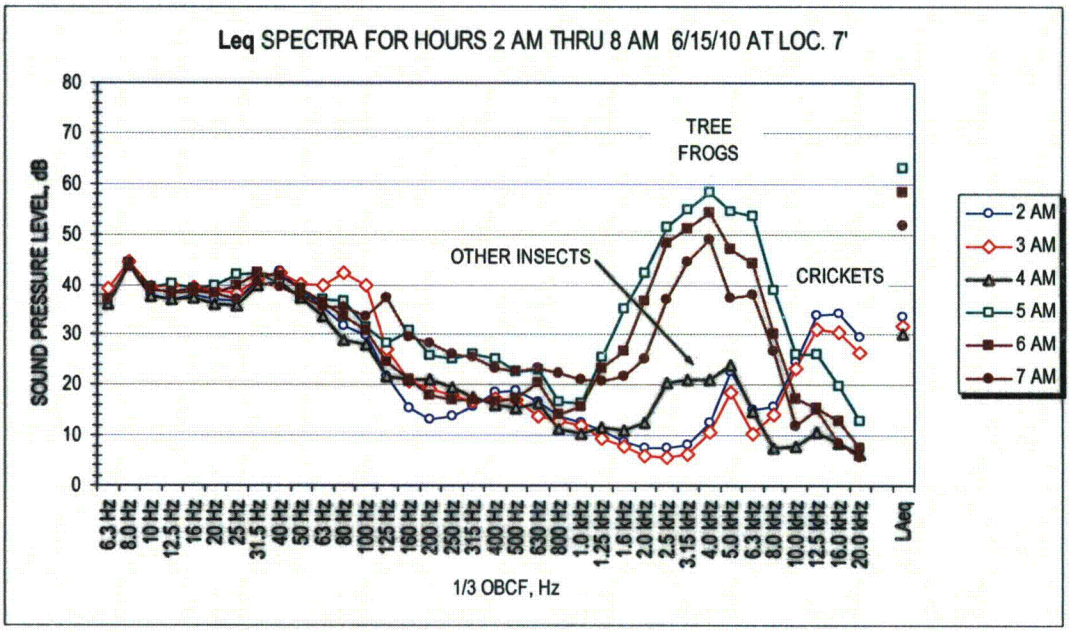

Figure 4: *Measured hourly spectra at Location 7'Leq metric.*

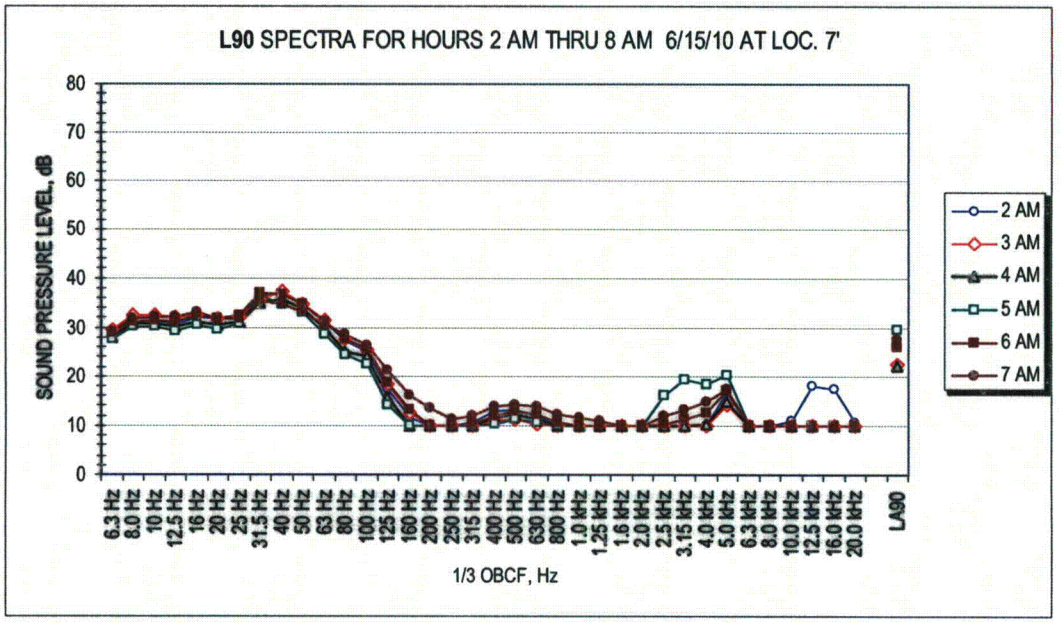

Figure 5: *Measured hourly spectra at Location 7'L90 metric.*

The next plot, Figure 5, shows the hourly sound levels for the L90 (residual) sound level metric for the same hours and it is clear by the repeatability from hour to hour that the L90 metric is a much truer representative for environmental noise. The Leq metric is 63 dBA for the 5-6 hour whereas the true level capable of masking power plant noise is only 30 dBA (L90) for this hour.

Insect 'contamination' of LAeq and Ldn noise measurements has existed since the metrics were developed by EPA in the early 1970s. Hessler[2] and Schomer, et al[3] have shown that a simple new sound level meter (SLM) weighting called Ai could be incorporated into a SLM that would eliminate insect noise. Current members of the ISO standards body working group S12 WG15 are considering it for standardization, but until then we report the actual measured levels including the tree frog 'contamination'.

It should be stated that the daily minimum LA50, LA90 and LAeq results given in Table 1 are not greatly influenced by insect noise and are eminently valid for environmental assessment purposes. Only the Ldn metric is affected.

Summary

As mentioned in the Test Methodology section, conditions for the survey were ideal to record minimum or very quiet levels. If one examines the plots in Figures 2 and 3 it is observed that the day time residual level, LA90 varies from 30 to 35 dBA at all measured locations. This is termed a "macro area ambient" and is typically found in very quiet suburban or rural areas as shown below:

Typical Residential Area Sound Levels (Source, EPA Community Noise Study)

Daytime Residual Level, dBA, Level Exceeded 90% of the Time, LA90

Description	Typical Range	Average
Very Quiet Rural or Remote Area	*26 to 30 inclusive*	*28 (New, HAI Study)*
Very Quiet Suburban or Rural Area	*31 to 35 inclusive*	*33 (ANSI B133.8)*
Quiet Suburban Residential	36 to 40 inclusive	38
Normal Suburban Residential	41 to 45 inclusive	43
Urban Residential	46 to 50 inclusive	48
Noisy Urban Residential	51 to 55 inclusive	53
Very Noisy Urban Residential	56 to 60 Inclusive	58

In essence, there is little steady ambient sound to mask plant noise emissions. This fact must be considered in the design of noise abatement for BBNPP and apparently it was for the design of SSES 1 & 2 as evidenced by fact there was no discernible operational plant noise observed from the existing facilities during the six visits to the site for these surveys.

Advise if I can assist in any other way or answer any questions.

George F. Hessler Jr., Bd. Cert. INCE

George F. Hessler Jr.

[2] Hessler, G.F., "Measuring ambient sound levels in quiet environments", Inter-Noise 2009, Ottawa, Canada, 23-26 August, 2009

[3] Schomer, Slauch,& Hessler , "Proposed 'Ai'-Weighting: a weighting to remove insect noise from field measurements", Inter-Noise 2010, Lisbon, Spain, 15-16 June, 2010