CBC
Engineers & Affiliates

April 19, 2004

Mr. Gerard Mack, Project Manager
Estill County Energy Partners, LLC
6000 Sulphur Well Road
Lexington, KY 40509

Re: Evaluation of Potential Noise Impacts from Construction and Operation of Estill County Energy Partners, LLC ("ECEP")– Site Assessment Report

Dear Mr. Mack:

This report is written to address the issues of KRS Chapter 278.708 (3) (a) 8. and Section 5 (3) (d). KRS 278.708 requires, among other things:

> 278.708 (3) (a) 8. Evaluation of the noise levels expected to be produced by the facility;
> 278.708 (3) (d) Evaluation of anticipated peak and average noise levels associated with the facility's construction and operation at the property boundary.

**Property Description**

The ECEP facility will be located on the approximately 505 acre site of a former coal processing plant. The nearest adverse property boundary is the opposite bank of the Kentucky River which is approximately 400' from the planned stack. (The CSX railroad property which passes through the site is also a property boundary, but when it is occupied, it is occupied by a moving train which is louder than the power plant. The CSX property line has not been considered in the noise level tables provided in this study. The nearest residence is some 2100' away. Please refer to the Two Mile Vicinity Map contained in the Site Assessment Report for the location and applicable distances. The noise estimate study will be based upon test data from existing CFB power plants and from studies conducted by the EPA.

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**Construction Noise Levels**

EPA contracted a study entitled Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, December 31, 1971 prepared by Bolt Beranek and Newman. Table 1 is a chart with common sound levels for specific types of equipment and construction sources. Table 2 is a chart depicting common sound levels/sources and the subjective human response. The EPA model does not take into account attenuation of the noise, which would occur as a result of forested areas along the river and topographic variations common in this part of Estill County. Results indicate that the nearest residence to the ECEP facility will experience noise levels less than 60 dBA (57 dBA) from any of the construction activities.

**Table 1:**

| **Typical Peak Noise Levels from Construction Activities for Industrial Projects** | | | |
|---|---|---|---|
| Construction Activity | Average Sound Level at 50 feet (dBA)1 | Property Boundary At 400 feet | Nearest Residence At 2100 feet |
| Air Compressor | 81 | 63 | 48 |
| Crane | 88 | 70 | 56 |
| Pneumatic Tool | 85 | 67 | 53 |

This information is provided to compare noise levels at the property boundary and nearest residence with other typical sounds. Noise associated with finishing would correlate to approximately 57 dBA at the nearest residence, similar to having a conversation at 3 feet. Noise associated with erection of major components would correlate to approximately 52 dBA at the nearest residence, similar to a quiet neighborhood.

**Table 2:**

| **Common Sound Levels/Sources and Subjective Human Resources** | | | |
|---|---|---|---|
| Thresholds/ Noise Sources | Sound Level (dBA) | Subjective Evaluations | Possible Effects on Humans |
| Human Threshold of Pain Carrier Jet Takeoff (50ft) | 140 | DEAFENING | Continuous exposure to levels above 70 can cause hearing loss in majority of population |
| Siren (100ft) Loud Rock Band | 130 | | |
| Jet Takeoff (200ft) Auto Horn (3ft) | 120 | | |
| Chain Saw Noisy Snowmobile | 110 | | |
| Lawn Mower (3ft) Noisy Motorcycle (50ft) | 100 | VERY LOUD | |
| Heavy Truck (50ft) | 90 | | |
| Pneumatic Drill (50ft) Busy Urban Street, Daytime | 80 | LOUD | |
| Normal Automobile at 50mph Vacuum Cleaner (3ft) | 70 | | Speech interference |
| Large Air-conditioning unit (20ft), Conversation (3ft) | 60 | MODERATE | |
| Quiet Residential Area Light Auto Traffic (100ft) | 50 | | Sleep Interference |
| Library / Quiet Home | 40 | FAINT | |
| Soft Whisper (15ft) | 30 | | |
| Slight Rustling of Leaves | 20 | VERY FAINT | |
| Broadcast Studio | 10 | | |
| Threshold Human Hearing | 0 | | |

**Operational Noise Levels**

Noise levels emanating from the power plant construction and operation have been estimated based on test data from an existing power plant and from studies conducted by the EPA. The power plant is the Burbank Magnolia power plant. The size of the proposed ECEP Plant is much smaller than the Burbank Plant, which is the source of our sound estimates, but this comparison will allow for a worst-case scenario. The resulting noise projection at the property boundary and the nearest residence are shown in table 3. The greatest level of noise expected from the proposed plant will be short term 'steam blows' that occur only during the construction and start-up phase.

A typical noise iso-somediagram for one manufacturer's reference 100-150 MW CFB plant is included. The units are distance in meters and sound levels in decibels. It shows a 64 db line of sound level before reaching the 400 foot point from the plant property boundary. Data from other power plant equipment manufacturers is similar. Please see Attachment I at the conclusion of this report.

**Table 3:**

| Operating Equipment | | Property Boundary at 400 feet | Nearest Residence at 2100 feet |
|---|---|---|---|
| Boiler Feed Water Pumps | | 48 | 33 |
| Steam Turbine & Generator | | 65 | 51 |
| Condensate Pumps | | 48 | 33 |
| Step-up Transformer | | 33 | 19 |

No local, state, or federal noise ordinances exist to effectively establish any fixed standards for construction and operation of the proposed ECEP facility. Some standards exist for workers at construction and operation work sites for this type project. However, employee standards do not address the issues raised in the aforementioned statute. Instead, ECEP is asked to evaluate the potential for noise pollution for surrounding property owners.

Existing noise sources at this site have been significant, such as rail and truck traffic and the recently closed coal preparation plant. While noise levels were not recorded for those coal preparation activities, we can assume based on the amount of similar equipment (pumps, fired heaters, fuel handling conveyors, trucks, trains and crushers) that the noise levels projected in this report for the power plant would be very similar to this previous coal preparation activity. The coal preparation plant included a coal fired thermal dryer which was used to reduce moisture levels in the final coal product and is similar to equipment in the CFB boiler system. The dryer and railroad engines represented the noisiest pieces of equipment on the property. In addition, the railroad engines continue to pass through the ECEP site and will into the future.

**Conclusion**

The proposed ECEP power plant site has been used as a coal processing plant since 1957. Neighbors to the ECEP site have been exposed to similar or greater levels of noise from operation of the plant, rail car unloading equipment, ingoing and outgoing coal trucks, and normal railroad engine traffic on CSX. The Bluegrass Army Depot has regularly detonated arsenal 9 – 12 miles away that can be heard at the site. Although these previous activities were not monitored for noise, equivalent or lesser noise is expected from power plant construction and operation. Noise has been estimated at the property boundary and the nearest residence. Noise levels are not projected to cause interference with normal activities. Please refer to the Land Use Map in the Siting Report for vegetation in the area surrounding the ECEP plant site. Also refer to the Cross Section Location Map and Cross Sections included in the Site Assessment Report which show topographic relief around the property.

Both vegetation and topography will further reduce the estimated sound levels at off site receptors.

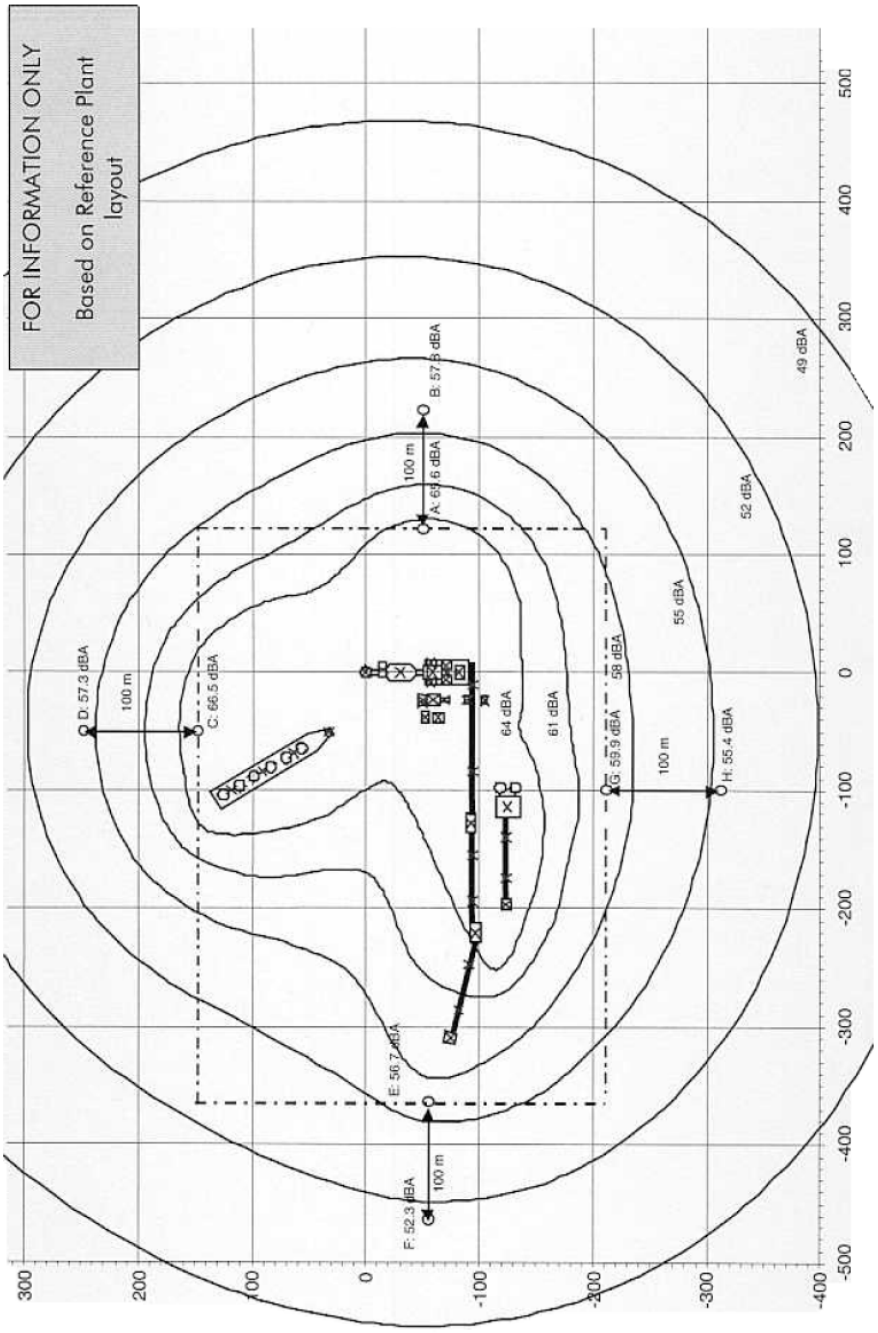
Based on these results, we believe that the proposed construction and operation is compatible with the surrounding community and neighboring properties.

Sincerely,

Dell Jaggers, P.E.
VP & General Manager

***Attachment: ( I. )***

**CFB REFERENCE PLANT 100-150 MW**
**FAR FIELD NOISE LEVELS EMITTED BY PLANT**
**DURING NORMAL OPERATION**



**APPENDIX A**

| **Major Plant Pumps** | | |
|---|---|---|
| Source dBA | Feet from Source | Results |
| 90 | 3 | 90.0 |
| | 50 | 65.56 |
| | 100 | 59.54 |
| | 150 | 56.02 |
| | 200 | 53.52 |
| | 250 | 51.58 |

| **Steam Turbine and Generator** | | |
|---|---|---|
| dBA | Feet | Results |
| 65 | 400 | 65.0 |
| | 450 | 63.97 |
| | 500 | 63.06 |
| | 550 | 62.23 |
| | 600 | 61.47 |
| | 650 | 60.78 |
| | 700 | 60.13 |
| | 750 | 59.54 |
| | 800 | 58.98 |
| | 850 | 58.45 |
| | 900 | 57.95 |
| | 950 | 57.48 |
| | 1000 | 57.04 |
| | 2000 | 51.02 |
| | 4000 | 45.0 |
| | 6000 | 41.5 |
| | 8000 | 38.98 |
| | 10000 | 37.04 |

| **Step-Up Transformers** | | |
|---|---|---|
| dBA | Feet | Results |
| 85 | 3 | 85.0 |
| | 50 | 51.02 |
| | 100 | 45.0 |

| **Cooling Tower Cell** | | |
|---|---|---|
| dBA | Feet | Results |
| 65 | 400 | 65.0 |
| | 450 | 63.97 |
| | 500 | 63.06 |
| | 550 | 62.23 |
| | 600 | 61.47 |
| | 650 | 60.78 |
| | 700 | 60.13 |
| | 750 | 59.54 |
| | 800 | 58.98 |
| | 850 | 58.45 |
| | 900 | 57.95 |
| | 950 | 57.48 |
| | 1000 | 57.04 |
| | 2000 | 51.02 |
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