

# TAB 5A



**Hessler Associates, Inc.**  
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May 26, 2016

Mr. Michael Wood  
Burrillville Town Manager  
105 Harrisville Main St.  
Harrisville, RI 02830

Reference: L-2024-051816-A

Subject: Invenergy Clear River Energy Center  
Facility Noise and Community Noise Impacts

Dear Mr. Wood:

As you know, we have reviewed the initial noise study submitted with Invenergy's permit application for the Clear River Energy Center (CREC) project and their responses to subsequent data requests. At this point we are generally comfortable with what is being proposed in the sense that Invenergy has been appropriately responsive and has committed to an acoustical design that, as long as it's fully realized, should lead to minimal and most likely acceptable community noise levels during all operating modes.

Summarized below are our opinions and views on some specific noise issues we feel are important to the Town.

#### **Town Noise Ordinance Compliance - Overall A-weighted Limits**

Section 16-39 of the Burrillville Noise Ordinance restricts the sound emissions from the plant (or any source) to 53 dBA during the day and 43 dBA at night. For a source that will operate around the clock, at least at times, the nighttime limit of 43 dBA is the effective design limit. This level is unusually low and restrictive because essentially all known State and local ordinances and regulations do not go below a limit of 45 dBA at night. Consequently, we believe that compliance with such a low level at all of the nearest residences will be adequately protective of the community. To put it in context, a sound level of 43 dBA is low in absolute terms and might be the sound level that is found in a typical conference room or library and it is also low in relative terms compared to the existing background sound level at the nearest residences, which was



measured by Invenergy's acoustical engineer to range from about 41 to 49 dBA. This means that during the quietest overnight hours, when 41 dBA was measured, a plant sound level of 43 dBA will be unobtrusive, if not entirely imperceptible relative to the background level at the nearest residences on Wallum Lake Road. Because of the way decibels add logarithmically the new total would theoretically be 45 dBA (and *not* 84 dBA, as might be imagined). A new source generally has to exceed the prevailing background level by about 5 dBA or more before it starts to become noticeable, so we would not expect a sound level of 43 dBA (attributable solely to the plant) to be intrusive or even perceptible relative to the minimum observed background level of 41 dBA. Consequently, it should subjectively sound about the same as it does now at the nearest residences, even in the middle of the night. By "the same" we mean that noise from the compressor station will continue to be what is heard and the CREC will be quiet enough that it is essentially covered up by existing sounds, even in the absence of road traffic.

At the next nearest residences in other directions somewhat lower facility sound levels can be expected simply because they are further away than the closest residences on Wallum Lake Road - which is the effective design point for the plant and where the Ordinance limit of 43 dBA must be met. These lower levels are on the order of 40 dBA or less, which is extremely quiet. Many years of experience with power plant noise indicates<sup>1</sup> that such a sound level is so low in absolute terms that disturbance is highly unlikely - even in rural environments where the background sound level is essentially negligible, as it appears to be at locations like Doe Crossing Drive and Jackson Schoolhouse Road. Consequently, we would not expect any issues at any other residences, despite the absence of any significant masking noise, so long as the facility is meeting the Ordinance limit at the closest houses on Wallum Lake Road.

### **Town Noise Ordinance Compliance – Octave Band Limits**

In addition to the overall A-weighted sound limits, the Town Ordinance also contains a restriction on the frequency content of the sound in the form of nine octave band limits, each covering a section, or band, of the audible frequency spectrum. In general, octave band limits are fairly uncommon because, among other things, it takes somewhat sophisticated instrumentation to measure them, they add technical complexity to what would otherwise be a fairly simple regulatory statute and they effectively impose 10 noise limits (9 octave bands and the overall A-weighted limit) on an applicant or noise generator instead of one. Their only real usefulness is in placing very specific limits on low frequency noise; i.e. below about 125 Hz, and even that could be handled by other means (a C-weighted limit, for example).

In this particular case, there is no need for a special restriction on the lower frequencies, or on any other frequencies, because combined cycle plants like the CREC do not produce problematic levels of low frequency noise and more generally emit a bland, broadband sound that is evenly spread

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<sup>1</sup> A conference paper I wrote some years ago on this very topic is attached for reference: Hessler, D. M., "Recommended Noise Criteria for Siting Industrial Facilities Near Residential Communities with Extremely Low Ambient Sound Levels", Noise-Con 2005, Minneapolis, MN, Oct. 2005.

across the frequency spectrum; a sound that is not typically considered noticeable or intrusive at the levels and receptor distances associated with this project. Other types of plants, such as simple cycle gas turbines and gas compressors, on the other hand, do commonly generate excessive and detrimental levels of low frequency noise, but the boilers associated with combined cycle plants act, coincidentally, as expansion chamber mufflers (like very large car mufflers), which, because of their physical size, happen to be effective at breaking up long wavelength low frequency noise coming from the gas turbine exhaust. Consequently, in our decades of experience designing and testing combined cycle plants we have never seen complaints or issues specifically associated with low frequency noise, irrespective of the plant sound level at nearby neighbors or its proximity to sensitive receptors.

In addition to this it is important to realize that the octave band limits contained in the Town Ordinance, especially in the lower frequencies, are well below all the other octave band regulatory limits that we're familiar with. The chart below shows a series of nighttime octave band noise limits from a variety of jurisdictions compared to the Town's limits (thick red line).

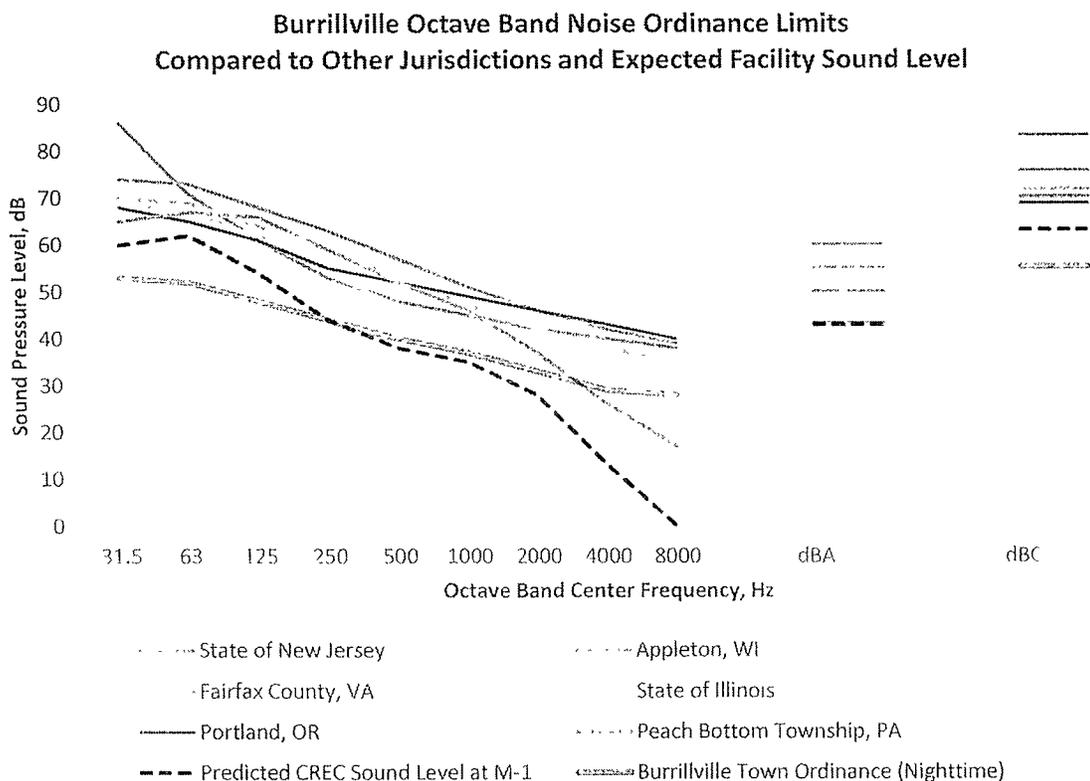


Figure 1



This graphic shows that the Town's limits are well below what might be considered the norm, but, more to the point, there is no actual need for the limits to be this low. The expected plant sound level at the closest residences is shown as the blue dotted line. Although it's not intuitively obvious, the plant would not be any less audible or sound any quieter if its sound levels in the three lowest octave bands were equivalent to the Ordinance rather than over the limits as currently predicted because, in a nutshell, the human ear is not very sensitive to frequencies below about 200 Hz, so the facility would effectively sound the same either way. In fact, subjective audibility is basically quantified by the overall A-weighted sound level and both the Ordinance spectrum and the plant sound spectrum in the chart both total up to 43 dBA, indicating that the sounds are of the same subjective magnitude. This overall limit of 43 dBA fully serves the purpose of limiting the project's noise to an acceptable level in the community. Invenergy has repeatedly argued that it is not feasible to meet the lower octave band limits and they have asked for a waiver on the octave band requirements. This is a legitimate assertion and a legitimate request. We would agree that it is probably technically impractical - and would add that it would do nothing to reduce the subjective audibility of the plant if it were.

#### **Facility Noise during Plant Start-ups**

In the noise study in the initial permit application the sound emissions from the plant were evaluated during normal steady-state operation at full load. While this sounds like it would be the time when the plant produces its maximum noise, it isn't. Combined cycle plants have to go through a warm up period when they start-up that generally takes anywhere from 40 minutes to 2 hours. During this time there are various processes that occur that, if inadequately mitigated, can result in substantially higher noise levels during this period, which is often in the early morning hours (5 to 6 a.m.) when additional noise is clearly undesirable.

There is no proviso in the Burrillville Ordinance, or in any other regulatory statute, that makes an exception for start-up noise or distinguishes between different operating modes. In fact, all noise ordinances are mute on the subject, which implies that the limit is the limit irrespective of what process happens to be occurring at the plant.

Despite the fact that regulatory noise limits implicitly cover all non-emergency operating modes, start-up noise, or the potential for it, is not commonly brought up in noise impact studies prepared for permit applications - or is swept under the rug as a short-lived and intermittent noise of no consequence. We believe there are several reasons for this:

- Start-up noise is frequently specifically excluded from contractual noise guarantees; i.e. the performance guarantees between a plant owner and the company that actually builds the plant for them normally specify the maximum permissible sound level from the facility during normal, full load operation only. Start-up, shutdown and transients are usually excluded; even, sometimes, in cases where they shouldn't be, such as when a state or local noise limit exists.

- The potential for louder facility noise emissions during start-up is something that might be perceived as a negative in the eyes of permitting authorities. Moreover, the very possibility of higher noise levels during start-up is an esoteric fact that only those intimately familiar with power plants are even aware of -- so why unilaterally bring it up.
- And, somewhat surprisingly, many in the industry, including some developers and many acoustical consultants, are themselves unfamiliar with the mechanics of combined cycle plants and the potentially serious noise issues associated with start-up.

Consequently, while not all that unusual, we would fault the Applicant for avoiding any mention of start-up noise in their initial noise study for the important reason that the plant will employ air cooled condensers (ACC's). In our experience, ACC's are particularly prone to extremely high noise levels during start-up because very high pressure steam, not yet suitable for introduction into the steam turbine, is bypassed directly into a cavernous duct leading to the condenser (Figure 2). Because this duct is maintained at less than atmospheric pressure by vacuum pumps and noise generation over a valve is largely proportional to the pressure differential, it is quite difficult to keep this process, essentially a continuous explosion, quiet, even with "low noise" valves.

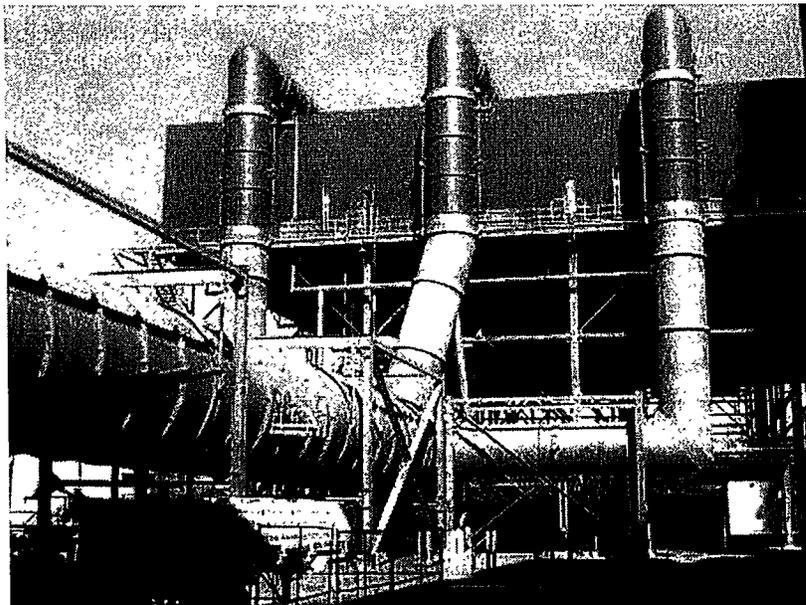


Figure 2 Typical ACC Steam Duct

To their credit, when queried about this issue through the data request process, Invenergy did the right thing and commissioned an additional, detailed noise modeling study to evaluate the sound emissions from the facility specifically during start-up and steam turbine bypass. We have reviewed this new study and consider it competently done; however, the model inputs representing noise from steam turbine bypass into the condenser duct appear to be rather optimistic and much



lower than we would realistically expect. Even with these low sound levels the conclusion of the study was that the plant sound level would increase to 46 dBA at the nearest residences on Wallum Lake Road on a temporary basis during start-up.

In response to this information a set of further data requests was submitted with technical questions about the report and its conclusions. When asked about the origin of the apparently low sound levels assumed for bypass noise, the response from Invenergy's consultant was that they were obtained from the bypass valve supplier and represented the supplier's guaranteed sound levels. Because we have never seen a case where bypass noise was anywhere close to the valve manufacturer's guarantees, we are skeptical that such levels will be realized. If we were designing this plant we would seriously consider extending the turbine building to encompass the ACC steam duct and add heavy duty acoustical lagging to any parts of the horizontal manifold or risers that end up outside the building envelope. Or, in other words, we would not rely entirely on the valve noise guarantees, if only because it would be quite expensive and difficult for the facility EPC (engineering, procurement and construction) contractor or owner to enclose or lag this duct on a retrofit basis.

The data requests following the submission of the start-up noise report also questioned the predicted Ordinance exceedance of 46 dBA at the nearest houses (vs. the 43 dBA Town limit). The unequivocal response was that Invenergy would do whatever was needed to ensure that 43 dBA would be maintained during all normal modes of operation including start-up and shutdown. It was also pointed out in the data request responses that the EPC contractor, the plant builder Invenergy hires to actually construct the facility, would be contractually required to realize this performance. This last statement is highly reassuring because contractual performance guarantees are taken very seriously by EPC contractors, who are obligated to meet each requirement in a timely manner or risk significant financial penalties known as liquidated damages.

A compliance test, performed by the owner or, more commonly the EPC contractor, is normally required to verify that the contract conditions on noise have been satisfied. Although such a test is practically inevitable here given the stringent noise limits associated with the project, the Town may want to make this test a mandatory condition of the permit and reserve the right to witness the test and/or conduct its own independent testing.

Although we foresee some significant additional costs for transient noise abatement, we are satisfied that Invenergy has now been fully alerted to this potentially serious noise problem (along with most of the townsfolk during the April 28<sup>th</sup> board meeting) and will pay appropriate attention to keeping steam turbine bypass noise in check.

In summary, then, it is our opinion that the CREC facility will have a minimal and generally acceptable noise impact on the community so long as the overall, A-weighted nighttime Ordinance noise limit of 43 dBA or less is maintained during all normal, non-emergency operating modes at all of the nearest residences. Compliance with the octave band frequency limits also contained in



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the Ordinance is not a precondition to this outcome and these unusually and unnecessarily demanding limits may be waived as requested by the Applicant without detriment to the community, if only because combined cycle plants do not generate problematic levels of the low frequency noise. Furthermore, we are satisfied with the data request responses and believe that the Applicant has been alerted to the seriousness of the steam turbine bypass noise situation during plant start-ups and will ensure through contractual performance guarantees that the facility EPC contractor will take appropriate steps to contain and control this noise - something that might otherwise have been a unpleasant surprise to all and something that would have been difficult to resolve on a retrofit basis.

Of course, please let me know if you have any questions.

Sincerely,

David M. Hessler, P.E., INCE  
Principal Consultant  
Hessler Associates, Inc.

# TAB 5B



**Hessler Associates, Inc.**  
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July 12, 2016

Mr. Oleg Nikolyszyn  
Town of Burrillville  
105 Harrisville Main St.  
Harrisville, RI 02830

Reference: L-2024-071216-0

Subject: Invenergy Clear River Energy Center  
Additional Comments on Facility Noise Issues

Dear Mr. Nikolyszyn:

In light of the public comments and other testimony presented prior to and during the June 20<sup>th</sup> and July 11<sup>th</sup> public hearings on the Clear River Energy Center project, I would like to add some additional comments and clarifications to the summary report, L-2024-051816-A, I submitted on May 26, 2016.

### **Public Meeting Noise Demonstration**

I understand from your description that a speaker was brought to one of the public meetings at the high school by a local resident, prior to the June 20<sup>th</sup> hearing, and used to supposedly demonstrate the noise from the proposed facility. I was not in attendance at that meeting, but it seems quite clear that the loud, “screeching” noise, which the resident variously described in terms of decibels and “MegaHertz”, was not in any way representative of the likely operational sound level thousands of feet from the plant. MegaHertz, by the way, refers to frequency rather than loudness or magnitude and would, in any case, be well beyond the high end of the audible spectrum, which tops out at around 20 kiloHertz. As you know, the Town Ordinance limits facility noise to an overall sound level of 43 dBA at the nearest homes. Such a level is so quiet that it may well be below the background level in the high school auditorium when no one is talking and possibly when the room is completely unoccupied. Consequently, I’m sure that the purported demonstration grossly misrepresented the sound emissions from the proposed facility.



## **Town Noise Ordinance – Waiver of Octave Band Limits**

I gather from some of the public comments that my recommendation to grant Invenergy's request to waive the octave band noise limits in the Ordinance (while maintaining compliance with the overall nighttime sound level of 43 dBA under all operating conditions) is viewed as an unwarranted concession that will expose neighbors to disturbing levels of low frequency noise or some other form of harm. That is not at all the case. Although clearly counterintuitive on the surface, the crux of the matter is that the Ordinance limits in the lower octave bands (31.5 to 125 Hz) are dramatically below the norm for regulatory frequency limits and needlessly so, in the sense that they are roughly 20 dB below the threshold of perceptibility or for any kind of potential disturbance from low frequency noise. Sound levels, say, 15 dB higher in these bands would be just as inaudible and innocuous as levels that were equal to the Ordinance limits. Once below the threshold of perception going lower doesn't make any difference. Moreover, combined cycle plants in general do not generate problematic levels of low frequency noise simply because the boilers automatically act as very effective mufflers with regard to turbine exhaust noise – so there is no actual need for a restriction on the low frequency emissions from this particular type of plant<sup>1</sup>.

So why not just keep the octave band limits anyway? In all fairness, the extremely low octave band limits in the lower frequencies, which are generally comparable to the background sound levels that might be observed in a rural area (remote from any compressor stations), would most likely be technically impractical to achieve – and, importantly, would not result in any tangible improvement in community sound levels. The facility would subjectively sound exactly the same whether the plant levels were meeting the Ordinance in the lower bands or were 5 to 10 dB over, as currently predicted. The short answer is that a waiver would be fair and reasonable.

## **Start-up Noise and Abatement**

At the April 28<sup>th</sup> informational board meeting I made it a point to publically detail and emphasize the very significant noise issues associated with start-up and shutdown noise at plants that use air cooled condensers. The objective of doing that was to make it painfully clear to Invenergy that they would have to take steam turbine bypass noise extremely seriously and do whatever was necessary to mitigate this noise to the point of insignificance so that compliance with the 43 dBA Ordinance limit could be maintained through starts and stops. Based on Mr. Hankard's testimony at the June 20<sup>th</sup> hearing I believe that message has been received and I am convinced that this noise will be adequately brought under control. The details of how that will actually be accomplished are not up to me nor should they be a concern of the town.

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<sup>1</sup> Gas turbine installations that do not employ boilers to capture heat from the turbine exhaust, on the other hand, commonly produce severe and disturbing levels of low frequency noise. This certainly appears to be the case with the simple cycle gas turbines driving compressors at the Spectra facility. Low frequency noise limits are of paramount importance for such plants.



Notwithstanding this favorable outcome, a misunderstanding has somehow arisen that this noise cannot be controlled because I said that I have not seen an ACC plant with a quiet steam turbine bypass system. That is true but it does not mean that it cannot be successfully attenuated. It is simply a matter of motivation and proper design – and the motivation is now in place in terms of Invenergy’s written commitment to maintaining compliance with the Ordinance limit of 43 dBA under all operating conditions and the town’s now-abundant awareness of the issue. As far as design goes there are essentially two approaches that could be taken to ensure - in advance - that bypass noise will be properly controlled:

#### *Field Verification*

The current noise guarantee from the bypass valve supplier (Control Components, Inc.) is a maximum sound pressure level of 82 dBA outside the steam duct opposite the valves during bypass and lower values at other points downstream. In order to verify this guarantee I would suggest field testing an installation using similar or representative valves and diffusers, if such a test can be worked out with CCI and the plant. If the actual performance conforms to the guaranteed value then appropriate noise mitigation can be designed (probably lagging only) to bring the overall system sound power down to the allowable value determined from the facility noise model. If the actual performance is higher than 82 dBA then the system noise abatement can be designed to whatever the higher level is.

#### *Assume Worst-Case*

If a field test is impractical then I would ignore the guarantee and assume that the steam duct sound level will be in the 95 to 100 dBA range during bypass (based on past first-hand measurements of ducts using CCI low noise valves). The mitigation required for such a situation would probably involve a free-standing rigid enclosure over the initial (Figure 1) or entire horizontal run and lagging on the vertical risers. However, the appropriate amount of attenuation for each section or component must be calculated through analytical modeling.

If field testing or design assumptions suggest an enclosure, it should be built along with the rest of the plant and not held back as a potential retrofit, since that would create a period during which start-up noise would presumably be non-compliant.

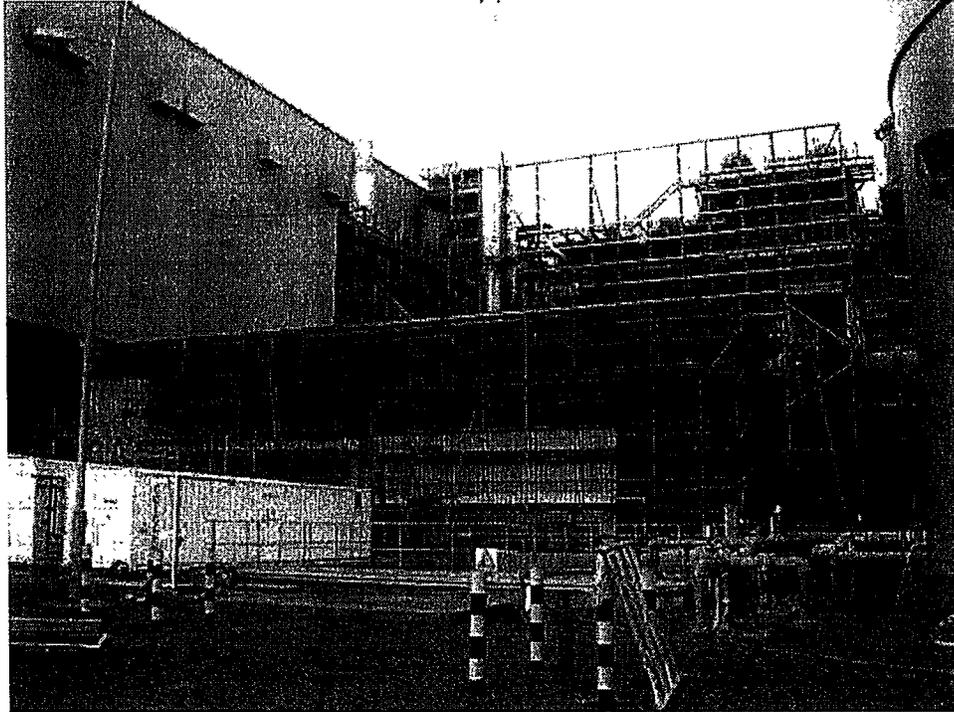


Figure 1 ACC Steam Duct Enclosure Under Construction

### Compliance Guarantees

Several comments from the public asserted that the company would violate the Ordinance noise limit without concern for any civil economic penalties and largely without fear that the town would sue. I cannot and do not wish to speak for Invenergy but in my experience working for numerous engineering, procurement and engineering (EPC) firms the town's noise requirements will be passed through as a contractual requirement to the company that actually designs and constructs the plant. It is this underlying contractual requirement that, I believe, will ensure that the noise emissions from the plant are compliant because the EPC contractor will do everything possible to avoid paying liquidated damages for defaulting on a contractual requirement. If some noise source is not properly mitigated it will be quickly fixed to avoid this financial penalty.

Above and beyond this it is my understanding that failure to comply would ultimately lead to a cease and desist order from the State, which, clearly, would not be an option for Invenergy.



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NOISE CONTROL ENGINEERING FOR POWER GENERATION AND INDUSTRIAL FACILITIES

Of course, please let me know if you have any questions.

Sincerely,

A handwritten signature in dark ink, appearing to read 'D. M. Hessler'.

David M. Hessler, P.E., INCE  
Principal Consultant  
Hessler Associates, Inc.

**TAB 5C**



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August 8, 2016

Mr. Michael Wood  
Burrillville Town Manager  
105 Harrisville Main St.  
Harrisville, RI 02830

Reference: L-2024-080616-0

Subject: Invenergy Clear River Energy Center  
Invenergy Peer Review Responses on Noise and Community Noise Impacts

Dear Mr. Wood:

We have reviewed Invenergy's recent responses to the peer review comments on noise and consider them satisfactory.

In particular, they have agreed or otherwise provided assurances that:

- The noise emissions from the completed plant will be measured as a condition of the construction contract to demonstrate that the facility is compliant with the effective Town Ordinance noise limit of 43 dBA under all operating conditions<sup>1</sup>. The testing will be monitored by the lender's independent engineer to verify the validity of the test results and permission has been granted for any parallel or additional testing that may be desired by the Town.
- They will pursue, as recommended, a field test of an existing facility with a similar steam turbine bypass system in order to witness and measure the actual acoustical performance of the low noise valves planned for the CREC project -- rather than rely entirely on the valve supplier's noise guarantees -- so that an appropriate acoustical design for the system can be developed during the design phase of the project.

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<sup>1</sup> This specific performance has been previously guaranteed in writing by Invenergy in earlier data request responses and in subsequent oral testimony.



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- They will take whatever appropriate steps are required to adequately mitigate noise during steam turbine bypass to maintain compliance with the nighttime Ordinance noise limit. The decision on Invernergy's part to only erect an enclosure over the ACC steam duct if testing at a prototype plant or credible field data from the valve supplier indicates that it is necessary is considered a reasonable approach. Our suggestion to build it as a precaution was only in the event that no pre-construction verification measurements could be taken to ascertain ahead of time what the sound emissions were going to be. However, in the event that such measurements are not possible and the sound emissions are higher than currently estimated, we would expect that a noise enclosure or other appropriate retrofit mitigation has been pre-designed and is ready to install immediately.
- In general, we believe the point has been made with regard to transient noise and that Invernergy has been adequately alerted to the extreme significance of steam turbine bypass noise and will act accordingly to successfully mitigate it.

Because compliance with the Town Ordinance at the nearest residences will be a contractual obligation of the engineering, procurement and construction (EPC) contractor and, in addition, a requirement that must be satisfied as a condition of the loan to finance the project, it appears to be a virtual certainty that the plant's noise emissions will meet the town's overall nighttime noise limit of 43 dBA. As explained in our supplemental comments letter to the Town dated July 7, 2016, there is no need to require compliance with the octave band noise limits also contained in the Ordinance because doing so would not make the plant any less audible but, importantly, would impose an essentially unachievable condition on the project. This recommendation is not in any way an endorsement of the project but simply the right and fair approach from a completely impartial technical viewpoint. The overall Ordinance limit of 43 dBA in and of itself is an appropriately protective noise limit for this particular facility because its low frequency sound emissions will be inherently insignificant.

Of course, please let me know if you have any questions.

Sincerely,

David M. Hessler, P.E., INCE  
Principal Consultant  
Hessler Associates, Inc.

**TAB 5D**



Mike McElroy <mcelroymik@gmail.com>

**Fwd: Invenergy's Responses to the RIDOH Draft Advisory Opinion - Attached**

1 message

David Hessler <davidhessler@earthlink.net>

Wed, Aug 10, 2016 at 7:30 AM

Reply-To: david@hesslerassociates.com

To: Michael McElroy <Michael@mcelroylawoffice.com>

Cc: "Michael C. Wood" <mcwood@burrillville.org>, Oleg Nikolyszyn <nikolyszyn@gmail.com>, Tom Kravitz <tkravitz@burrillville.org>

Mike,

I've read through Invenergy's responses to the RIDOH's Advisory Opinion on noise issues and think the rebuttals are generally valid and acceptable. Right now and probably well into the future the real community noise issue is the compressor station. The CREC plant, when designed to comply with the effective Town noise limit of 43 dBA, will be a minor contributor that won't significantly change or increase what is actually heard at the surrounding residences. That's really the simple bottom line. The only thing I would disagree with is Invenergy's assertion that the addition of new, presumably more modern and well-designed, gas turbines will lead to decreased sound emissions from the compressor station. I think the opposite is true, which would only make the compressor station noise more dominant, further burying noise from the CREC. While there may be many potentially adverse impacts from the CREC (water, traffic, ammonia, etc.), noise really isn't one of them. That issue has been dealt with. The focus now should be on seeing what can be done about the clearly excessive noise from the compressor station.

Regards,

David

**TAB 5E**



Mike McElroy &lt;mcelroymik@gmail.com&gt;

**re: Burrillville octave band waiver question**

1 message

**David Hessler** <davidhessler@earthlink.net>

Tue, Aug 16, 2016 at 9:57 AM

Reply-To: david@hesslerassociates.com

To: Michael McElroy &lt;Michael@mcelroylawoffice.com&gt;

Cc: Tom Kravitz &lt;tkravitz@burrillville.org&gt;, "Jeffrey Partington (jeffreywpartington@gmail.com)"

&lt;jeffreywpartington@gmail.com&gt;, "Michael C. Wood" &lt;mcwood@burrillville.org&gt;, Oleg Nikolyszyn &lt;nikolyszyn@gmail.com&gt;

Mike,

The main reason the octave band limits do not need to be enforced is that the low frequency sound emissions from a plant of this particular type (combined cycle) are typically inconsequential and below the threshold for any kind of disturbance, in terms of human audibility or the perception of vibrations, even a short distance beyond the plant fence. That is not the case, however, with the existing compressor station, which is essentially a simple cycle gas turbine power station only without the electrical output (the turbines drive gas compressors instead of generators). Consequently, the low frequency sound emissions in the immediate vicinity of the CREC site are already rich in low frequency noise from the Spectra turbine exhausts and the addition of the CREC won't substantially change or increase the low frequency sound levels in any meaningful way. That means that any potential impact on wildlife from low frequency noise, if there is one, is already present. I have never heard of any such sensitivity in animals, but that's not to say it doesn't exist. By the way, based on the model projections, the higher frequency sound emissions from the CREC are expected to be below the Town Ordinance limits; i.e. in compliance, at the nearest houses. It is only the lower frequencies (<250 Hz) that may exceed the extremely (unnecessarily) low town limits.

David M. Hessler, P.E., INCE  
Principal



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On 8/16/2016 5:58 AM, Michael McElroy wrote:

David:

Last night the Planning Board met. A motion was made to waive the octave band limits for the facility. During discussion on the motion, some members of the Planning Board said they did not feel they had enough information to vote on the waiver. They said they understood that the waiver would have no detrimental effect on humans based on your input, but did not know if granting the waiver would have any detrimental effect on wildlife in the area. The motion was then withdrawn and the Planning Board will consider the issue again next Monday evening.

Can you address in writing for me (an email is fine) whether granting the octave band waiver would result in any detrimental effect on wildlife in the area?

# TAB 5F



Mike McElroy &lt;mcelroymik@gmail.com&gt;

## Re: FW: Low Octave Band Noise (LFN) report

1 message

David Hessler &lt;davidhessler@earthlink.net&gt;

Mon, Aug 22, 2016 at 3:02 PM

Reply-To: david@hesslerassociates.com

To: Tom Kravitz &lt;tkravitz@burrillville.org&gt;

Cc: "Michael McElroy (Michael@mcelroylawoffice.com)" &lt;Michael@mcelroylawoffice.com&gt;, "Jeffrey Partington (jeffreypartington@gmail.com)" &lt;jeffreypartington@gmail.com&gt;, Chris Langlois &lt;clanglois@burrillville.org&gt;

Tom,

I received an e-mail the other day from what appeared to be the parent of college student who was doing some sort of research on power plant noise and its abatement. The parent said they had contacted numerous other acoustical engineering firms for insights on the subject and that, because they were all greedy and callous, none had responded and that the daughter was very disillusioned. I thought that last bit was touching and sad, so I took some time on Sunday to reply with some basic information and, in particular, stated that combined cycle plants don't normally produce any kind of problematic levels of low frequency due to the presence of HRSG's - and why that is. I now see it was all an underhanded trick to dig up some failing on Invenergy's part to mitigate low frequency noise from the CREC project - and I wish I had my Sunday afternoon back.

I stand by all my previous conclusions and recommendations on the matter of the Town's octave band limits. The fundamental situation is that even if the plant could be built to meet all the octave band limits including the lowest bands, which is doubtful purely from a technical feasibility perspective, it would not make the plant any less audible or prevent an otherwise adverse impact from low frequency noise. The low frequency sound emissions from the CREC would be insignificant in this environment even if the compressor station did not exist, and will be extremely insignificant relative to what are probably some very high existing levels of low frequency noise from the compressor station gas turbine exhausts. If any adverse health effects were going to occur they would already be occurring. Nor have I ever heard of any health issues from gas turbine noise. After having just skimmed the "report", I would say that Ms. Slocum's conspiratorial fears about this matter are completely misplaced and overblown.

Regards,

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Principal



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On 8/22/2016 12:35 PM, Tom Kravitz wrote:

David, Is there any information here that would change your thoughts from your most recent email of 8-16-2016?