

Request for Proposal,

**Source Characterization,
Community Monitoring
Noise Compliance Evaluation,
Noise Modeling
Mitigation Recommendation(s)**

RFP Due: No later than Friday afternoon, May 15 at 3:00PM. Three copies of your response, including an hourly rate sheet and an estimate of conducting the complete program of testing and compliance monitoring shall be provided. Send to the attention of Peter Lowitt, AICP, DEC, 33 Andrews Parkway, Devens, MA 01434 . Email response is acceptable. Send as a pdf to peterlowitt@devensec.com.

Background

Evergreen Solar is a relatively new tenant in the Devens Regional Enterprise Zone's West Rail Industrial Park along Barnum Road. In preparing their application for approval to develop the facility, they commissioned a noise study by CH2MHill. A copy of the Noise Analysis is attached. Their relatively large facility manufactures solar panels. Most of the facility produces little or no sound. Most of the sound producing equipment is located in the southwest rear corner of the facility facing the agricultural and residential neighbors along Old Mill Road. Sound from the facility has resulted in persistent complaints by the neighbors. The Devens Enterprise Commission (DEC) conducted preliminary sound level measurements that indicated that the source exceeded the 38 dBA at the residences at 42 Old Mill Road. Based on qualitative observation of the sound character, the sound field was dominated by the sound from the Evergreen Solar equipment. In the course of several visits, the observed sound level at the residence varied from visit to visit, while the sound at the source remained the same.

The preliminary surveys were followed by detailed measurements by Modeling Specialties of the sound at both the residence and also at the suspected source. Under the conditions of the detailed measurements on the evening of March 28 and early morning of March 29, 2009, the observed equipment sound was at the A-wtd compliance value of 38 dBA. However, the sound retained its tonal character. The tone was identified in a Notice of Noncompliance issued by the DEC. In response to the Notice of Noncompliance, Evergreen Solar identified maintenance issues and effected repairs and mitigation measures to address the tone(s). They summarized the results of their noise treatment efforts before the DEC on May 7, 2009. The affected members of the community were also invited to the presentation. While the treatment of specific sounds at the facility was appreciated, it is inadequate in the eyes of the community as other facility sounds remain intrusive at the receiving properties. In light of the hearing results, the DEC, on behalf of the Devens Community and affected neighbors requests a comprehensive analysis of the facility sounds. The intended result of the study is to identify mitigation options that Evergreen can implement to fully comply with the Devens Noise Regulations. The DEC is requesting a rapid response to the RFP.

To facilitate your response to the RFP, we have attached substantial background material to clarify the regulatory backdrop, the Evergreen Solar facility, the sources of facility sound, the affected community and the requested analysis. Figure 1 shows the Evergreen Solar facility in the context of the Devens community and the Harvard community to the south. Also shown are the three receptors used in the CH2MHill study along with the baseline sound level and compliance limit.

Requested is your proposed scope of services, schedule and associated cost for the study.



Figure 1: Project Area Showing Nearest Receptors and Summary of Project Baseline and Regulatory Limits

Devens Enterprise Commission Noise Regulation

The Devens Enterprise Commission has established noise regulations in 974 CMR 4.05.

The standards apply to all Devens properties and includes criteria to address broadband noise on and off Devens along with tonal limitations. The Devens Noise Regulation can be found in the context of other Devens Regulations at <http://unixweb.choiceone.net/d/e/devensec.com/cgi-bin/show2.cgi/1/decregs405.html?5:17:26:27:32:38:39:58:64:65:82:83:84:94:96:105:108>

The criteria are summarized below. Specific criteria that apply to this study are highlighted in yellow.

4.05 Noise and Vibration

Overview. The purpose of the noise and vibration performance standards is to preclude or significantly mitigate conditions that could cause nuisance to any receptor within or without Devens. More detailed definitions of interference sources and potential receptors follow herein under "Noise Limits and Standards".

While it is the intent of 974 CMR 4.05 to provide a local complaint mechanism for receptors that might be experiencing nuisance from the generation of noise or vibration, it is recognized that complaints can often be minimized by identifying and acting upon potential problems before they become contentious. For this reason, the complaint mechanism is supplemented and enhanced by a process which attempts to minimize or preclude potential noise and vibration issues at the time of application for site plan approval with respect to facilities in proximity to the perimeter boundary of Devens or at the time of application for a building permit with respect to facilities that have the potential of exceeding the performance standards within Devens.

Complaint and Enforcement Process

(a) Upon receipt of a noise or vibration complaint from a receptor, the Building Inspector or other duly authorized Devens Enterprise Commission (DEC) official shall respond to said complaint and attempt, by means of circumstantial and field investigative evidence, to attribute the potential nuisance to a point source. Where such attempts fail to reliably identify a point source and where the pattern of interference is judged by the Inspector to be of a repeated and pronounced nature, then the inspection official may, at his or her discretion and with the concurrence of the Land Use Administrator, require the likely violator to engage technical expertise for the purpose of documenting noise and vibration conditions at strategic locations.

Once there is reasonable certainty of the nuisance source, the violator shall be subject to providing reasonable mitigation measures that essentially resolve the difficulty. Refer to 974 CMR 4.05(2)(b) for a description of procedures relative to enforcement.

(b) Potential violators will be given thirty (30) days in which to respond to a complaint or otherwise provide reasonable confirmation to the DEC inspection official, that the problem did not exist or has been eliminated. If probable cause is determined, a second thirty (30) day time period will be granted in which to correct the interference or to demonstrate that good faith efforts have been initiated to correct the objectionable circumstances. If such efforts are not initiated, the violator may be subject to remedies in the Devens By-Laws, including levying or fines, requirements to post performance guarantees, permit reconsideration by the DEC, or legal action. Emergency nuisance conditions may, at the discretion of the DEC inspection official, require more expeditious remediation.

Noise Limits and Standards.

No party owning, leasing, controlling, or otherwise occupying a facility within Devens shall be allowed to cause pronounced, multiple patterns of noise or vibration nuisance to or interference with any receptor.

No party owning, leasing, or otherwise controlling a facility within Devens shall be allowed to:

(a) Produce a broadband sound pressure level which exceeds an existing background sound pressure level by the following margins:

5 dBA as measured at any residential property line or receptor within Devens;

10 dBA as measured at any commercial or industrial property line or receptor within Devens.

5 dBA as measured at any Devens perimeter boundary abutting a residential External Receptor

10 dBA as measured at any Devens perimeter boundary abutting a commercial or industrial External Receptor.

(b) Produce a broadband sound pressure level which exceeds the following levels:

45 dBA nighttime / 55 dBA daytime, as measured at any residential property line or receptor within Devens

60 dBA as measured at a commercial or industrial property line or receptor within Devens

45 dBA nighttime / 55 dBA daytime as measured at any Devens perimeter boundary abutting a residential External Receptor

60 dBA as measured at any Devens perimeter boundary abutting a commercial or industrial External Receptor.

(c) Produce a "pure tone" condition. (definition to follow)

(d) Produce "impulsive" noise in excess of decibel limits and durations established herein (definition to follow)

Background sound pressure level is defined as the A-weighted sound pressure level that is exceeded 90% of the quietest one-hour time interval during the equipment operating hours.

Residential receptors shall be defined to include churches (during hours of service), nursing homes, hospitals, rest homes, schools, day care centers, and any property in use as a residence.

Daytime hours are 7:00 am to 6:00 pm weekdays. Nighttime hours are all other times, including legal holidays.

All sound pressure level measurements are to be performed with slow sound level meter response.

All complaints regarding perceived noise violations shall be directed to the Devens Building Inspector, or other duly authorized DEC official. Upon investigation, said official shall work to identify the source. Any facility found to be in violation shall measure the existing background sound pressure level, and mitigate the problem as soon as it is reasonably possible. Measurement may include, but not be limited to establishing existing background sound levels, or noise modeling. Mitigation may include, but not be limited to the following: constructing appropriate housing for building systems; adding mufflers or other devices to engines used exclusively for handling material on-site; or adaptation of any other noise control devices and procedures for noise-producing equipment and activities. All expenses incurred for on-site mitigation measures shall be the responsibility of the facility found to be in violation.

All measured noise readings and mitigation efforts shall correspond to the time of day for which the complaint was reported.

A "pure-tone" is sound concentrated in a narrow frequency range, and is perceived as a humming, buzzing, whirring, or other such distinctive continuous sound. Pure-tone sound is often produced by industrial equipment such as fans, blowers, grinders, and transformers. A pure-tone condition is defined to exist when the sound pressure level in a one-third octave band exceeds the sound pressure levels in both

adjacent one-third octave bands, and if the average amount exceeded in both adjacent bands is greater than the following:

1/3 Octave Band Mid-Frequency (Hz)	Amount by which the average of both adjacent bands is exceeded
100	16
125	14
160	12
200	11
250	9
315	8
400	7
500	6
630	6
800	5
1000	4
1250	4
1600	4
2000	3
2500	3
3150	3
4000	3
5000	4
6300	4
8000	5
10000	6

"Impulsive" noises are sounds which occur intermittently rather than continuously. Impulsive noise may exceed existing background sound levels for a cumulative duration of not more than one minute within any given one-hour period, and subject to the following limits: 10 dBA as measured at any residential property line or receptor, or 15 dBA as measured by any commercial/industrial property line or receptor. Impulsive noise, as measured at any residential receptor shall only be allowed to occur during normal daytime hours. Readings for impulsive noise shall be recorded with fast sound level meter response.

Equipment employed in landscape and open space maintenance, or any construction-related activity shall be kept in good repair so as to minimize noise and vibration beyond the perimeter of Devens. In all cases, such equipment shall meet or exceed industry standards for noise muffling.

Requested Technical Analysis

In the course of the closure of Fort Devens and development of the current community of Devens, several baseline sound level studies have been conducted in the area around Devens. Studies dating back to 1993 have been reviewed to establish that the baseline sound level in the community along Old Mill Road is about 33 dBA. The measured baseline sound level reported by CH2MHill is also 33 dBA. For that reason, no additional baseline sound levels are needed for this study. The 1/3 octave band spectrum from baseline measurements are not reported but may be available from CH2MHill through Evergreen Solar if requested. The requested analysis relates to the measurement and monitoring of the combined ambient sound level and sounds from the Evergreen Solar Facility. If a different approach to the noise analysis is proposed, provide an explanation of why your approach is needed and what benefit would be gained by the proposed approach.

1. As stated in their Noise Analysis, CH2MHill analyzed the primary noise sources at the facility. Preliminary analysis indicates that there are sources of sound at the facility that were not modeled in the initial study. Among them are large fan units that drive air into the ventilation system along with materials and gas deliveries. The study will include a comprehensive inventory of the individual sources characterized by 1/3 octave band resolution and temporal characteristics. All sources will be identified based on location, elevation, and possible reflections and will be shown graphically in the report. All information needed to quantify the source sound power such as sound level, directionality size and shape will be noted. Noncontinuous sources such as material deliveries, will be further characterized by start and stop time. This may require coordination with Evergreen Solar staff based on their records.
2. The preliminary analysis indicated that the received sound level fluctuates significantly while the source remains the same. For this reason a 7 day monitoring study will be made at two community locations. The monitoring at 1 minute intervals will be scheduled during a time when acceptable weather is forecasted, but if the measurements are temporarily affected by weather conditions (that exceed the ANSI standards), those individual samples will be excluded from the analysis. Statistical values of Leq and L90 will be required for use in the analysis. Other metrics may also benefit the study. The proposed long term monitoring locations are shown in Figure 2. Additional attended measurement locations will be identified in the field based on site review.
3. The unattended long term monitoring at two locations should be supplemented by 20 minute attended monitoring at various other community locations shown on the accompanying map. The area should be surveyed to identify areas that might be exposed to more facility sound because of source directivity, building reflections, meteorology or any other propagation factor. The attended measurements will be in 1/3 octave band resolution. Statistical values of Leq and L90 will be required for use in the analysis. Other metrics may also benefit the study.
4. The results of the long term and attended measurements will be compared to the source inventory to identify any periods of daytime or nighttime noncompliance of the Evergreen Solar facility. The specific frequency or temporal character of the sources may make it possible to identify the specific source that caused the exceedance.
5. A three dimensional noise model will be assembled to incorporate all facility sources identified by the study. Using source power levels and representative propagation assumptions, the sound levels at the community locations will be predicted. The modeling results will be compared to the monitoring and attended measurement results to evaluate the performance of the noise model. The model will then be adjusted (or “calibrated”) appropriately to correctly model the facility sound.
6. The calibrated model will be used to identify conceptual noise mitigation options available to assure that facility emissions remain at or below the regulatory standards in the community. Each mitigation option shall cite the rough dimensions of the treatment area, necessary materials to accomplish the treatment and which sources will be affected. One or more treatment packages will be presented that will bring all facility sources into full compliance with the criteria.

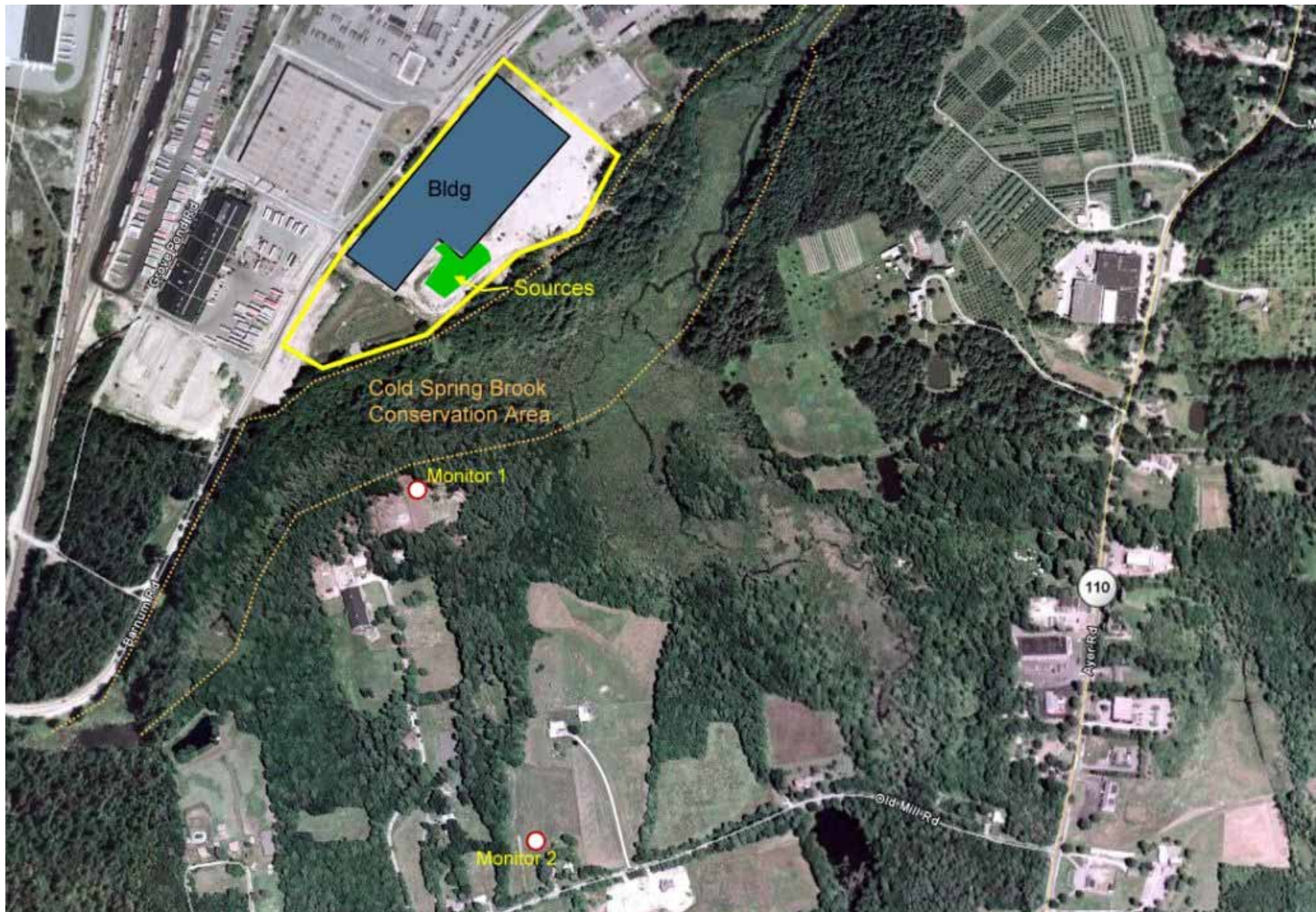


Figure 2: Project Area Showing Community Monitoring Locations for which Access has been Coordinated

7. The contractor will monitor and record activities not related to Evergreen Solar operators having an impact on the noise levels. This will include, but not limited to; ongoing road repair work of Barnum Road; demolition of buildings located on Barnum Road and future construction of a military facility across the street from the Evergreen facility.

8. The results of the study will be provided to the DEC outlining the above procedures and the results of each step of the study. The report will undergo two levels of review. First, it will be reviewed by the DEC for administrative completeness and consistency with these requested requirements. Then the study will be made available to Evergreen Solar and the community for further review. Administrative or technical deficiencies will be resolved to the degree deemed necessary by the DEC.

9. Within this scope should be assumed a nominal amount of coordination needed to clarify undocumented details of the study by Evergreen Solar for the engineering and implementation of the noise mitigation package. However, implementation support and post mitigation compliance demonstration is not a part of this scope. Mitigation measures identified by this study will be implemented by Evergreen Solar. They may or may not use the Noise Contractor to support the engineering of mitigation measures under a separate scope of services. Either way, such services will be outside the scope of this requested proposal.

RFP Due: No later than Friday afternoon, May 15 at 3:00PM. Three copies of your response, including an hourly rate sheet and an estimate of conducting the complete program of testing and compliance monitoring shall be provided. Send to the attention of Peter Lowitt, AICP, DEC, 33 Andrews Parkway, Devens, MA 01434 . Email response is acceptable. Send as a pdf to peterlowitt@devensec.com.