#### Caltrans Hydroacoustic Monitoring and Reporting for Underwater Sound Pressure

Preliminary results for daily hydroacoustic monitoring of underwater sound pressure elevation levels must be reported to the primary point of contact[[1]](#footnote-1) at the Services within *X hours* after monitoring concludes for the day. A final draft report including data collected and summarized from all monitoring locations will be submitted to the Services within 90 days of the completion of monitoring. Results will be summarized in graphical form and include summary statistics and time histories of impact sound values for each pile and a final report will be prepared and submitted to the Services within 30 days following receipt of comments on the draft report from the Services.

Sound attenuation is required for all in water piles that are expected to exceed a Peak underwater sound elevation level of 206dB. is used during monitoring an analysis of the change in the waveform and sound levels with and without the attenuation device in operation will be conducted.

The report shall include:

1. Size and type of piles.
2. A detailed description of the *name type of noise attenuation device*, including design specifications *(if applicable)*.
3. The impact hammer energy rating used to drive the piles, make and model of the hammer.
4. A description of the sound monitoring equipment.
5. The distance between hydrophone*(s) or microphone(s)* and pile.
6. The depth of the hydrophone*(s)* and depth of water at hydrophone locations.
7. The distance from the pile to the water’s edge.
8. The depth of water in which the pile was driven.
9. The depth into the substrate that the pile was driven.
10. The physical characteristics of the bottom substrate into which the piles were driven.
11. The total number of strikes to drive each pile and for all piles driven during a 24-hour period.
12. The underwater wideband background sound pressure level reported as the 50% CDF *(if applicable)*.
13. The results of the hydroacoustic monitoring, as described under Signal Processing. An example table is provided in Appendix C for reporting the results of the monitoring.
14. The distance at which peak, cSEL, and rms values exceed the respective threshold values.
15. A description of any observable fish, marine mammal, or bird behavior in the immediate area will and, if possible, correlation to underwater sound levels occurring at that time.
16. *If airborne noise monitoring is required, broadband A-weighted and unweighted maximum, minimum, and average Lmax and Leq levels shall be tabulated for every pile. For each pile size and substrate type frequency spectra (one-third octave minimum frequency resolution) charts will be included to show the frequency content of Lmax and Leq signatures. The frequency content of airborne noise background levels shall also be shown. Background sound levels or L95 surrogate for background sound shall be reported*

**Table: Required Information for Reporting Hydroacoustic Results of Monitoring Pile Driving**

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| Date and Time | Pile ID | Hammer Impact or Vibratory | # Strikes or Vibratory Seconds | Distance to Pile from  Hydrophone (m) | Water  Depth (m) | | Peak (dB) | | | SEL90% (dB) | | | | RMS90% (dB) | | | Notes |
| At  Pile | At  H-phone | Max | Min | Mean | Max | Min | Mean | cSEL90% | Max | Min | Mean |
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1. The primary point of contact is the biologist that conducted the Section 7 consultation for the Service(s). In the event that the consulting biologist is not available, communication regarding monitoring results and reports should be addressed to the manager of the consultation branch or division with a reference to the consultation title. [↑](#footnote-ref-1)