SUBMITTAL RECORD

CONTRACTOR'S USE:

TO: Fredrick Block

Gilbane Building Company
304 Inverness Way South, Suite 200
Englewood, CO 80112
(720)-717-5899

FROM: Grace Bowman

Power Engineering Construction Co.
1501 Viking Street, Suite 200
Alameda, CA 94501

DATE: February 14, 2023

SIGNATURE:

X *Grace Bowman*

Date: 2/14/23 Project: USCG Wharf Extension Contract #: 70Z04718DGILBAN00

Submittal No: 56 Rev. No: 0 Spec. Section: Dwg. No:

Subcontractor / Supplier: WRA / Illingworth & Rodkin Copies: Electronic

Title: Marine Mammal Monitoring & Hydroacoustic Report

Item	Description *(Describe Topic and Contents of Submittal)*	Reviewer's Action (see attached for comments, if provided)				
		NET	MCN	REJ	R&R	SUB
1	Marine Mammal Monitoring Report – WRA					
2	Hydroacoustic Monitoring Report – Illingworth & Rodkin					

SUBMITTAL RECORD

Reviewer's Remarks:

LEGEND
AP = Approved
MCN = Make Corrections Noted
FAI = Furnish Additional Information
REJ = Rejected
R&R = Revise & Resubmit
SUB= Substitution

	FOR REVIEW			FINAL DISTRIBUTION	
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Reviewer's Signature: _____
Reviewer's Signature: _____
Reviewer's Signature: _____

wra
Environmental
Consultants

MEMORANDUM

TO:	Scott Williams	**FROM:**	Patricia Jaramillo Project Biologist WRA, Inc.
CC:	Michael Nieto Southern California Natural Resource Director WRA, Inc.		
DATE:	February 10, 2023		
SUBJECT:	Draft Marine Mammal Monitoring Report for the Base Los Angeles Long Beach (Base LA/LB) High Endurance Cutter (WHEC) wharf Project (NMFS Ref. No. WCRO-2021-00759, Corps File No. SPL-2020-00728-LP)		

Dear Mr. Williams:

The purpose of this report is to present the results of marine mammal monitoring during pile driving at the Base Los Angeles Long Beach (Base LA/LB) High Endurance Cutter (WHEC) wharf located at San Pedro, California, conducted under the Incidental Harassment Authorization (IHA) issued by National Marine Fisheries Service (NMFS) on December 21, 2021. The IHA required that marine mammal monitoring occur during all pile driving and in-water construction activities. The IHA specified respective allowances for "take" (Level A and B incidental harassment due to pile driving) applicable to each mammal species with some potential to occur near the Project Area during work activities. The IHA authorized taking of harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), gray whales (*Eschrichtius robustus*), common bottlenose dolphins (*Tursiops truncatus*), and short-beaked common dolphins (*Delphinus delphis*). These allowances are detailed in Table 1 below. In addition to the marine mammals listed above, the USCG has determined that the proposed action may affect, but is not likely to adversely affect, federally listed threatened species, the green sea turtle (*Chelonian mydas*; GST) East Pacific (DPS) (81 FR 20057) as a result of the open water construction elements within the OPC Homeporting proposed action. GST in the eastern Pacific Ocean are considered threatened throughout their range with the northern extent of nesting in Baja California, Mexico, but individuals occur farther north to the California Coast. There are currently no areas designated as critical habitat for green turtles under the ESA in this project area. This report was written in compliance with the Marine Mammal and Sea Turtle Monitoring Plan written by WRA in April 2022.

Table 1. Authorized Amount of Taking, by Level A and Level B harassment, by species and stock.

Species	Authorized Take	
	Level B	Level A
Harbor seal (*Phoca vitulina*) California Stock	0	19
California sea lion (*Zalophus californianus*) U.S. Stock	380	0
Gray whale (*Eschrichtius robustus*) Eastern North Pacific Stock	0	2
Common bottlenose dolphin (*Tursiops truncatus*) California Coastal Stock	114	0
Short-beaked common dolphins (*Delphinus delphis*) California/Oregon /Washington Stock	200	0

Background

The United States Coast Guard (USCG) proposes to homeport two Offshore Patrol Cutters (OPC), each vessel of 360-ft in length, at Base Los Angeles Long Beach (Base LA/LB) High Endurance Cutter (WHEC) wharf located at San Pedro, California (Figure 1), which would require the construction of a 260-ft wharf extension of approximately 5,914 ft2 added to the USCG Base LA/LB to accommodate the two vessels (Figure 2). The project will be completed in three phases: the Test Pile Program (Phase I), Pile Driving and Wharf Work (Phase 2), and Onshore Maintenance and Weapons Division/Cutter Support Facility Construction (Phase 3).

The proposed action includes the removal of existing wharf appurtenances, installation of estimated number of piles that included: fourty-eight-24-inch precast pre-stressed octagonal concrete piles; seventy-two 24-inch square precast pre-stressed concrete piles; nine 18-inch fiber reinforced plastic piles, concrete deck panels, cast-in-place concrete pour and topping slab, and installation of the new wharf appurtenances. Also, the proposed action includes 50 lineal feet of revetment restoration and repair where this work will be performed above the Mean High Tide Line to the top of the alignment of the existing slope.

Monitoring Methods

Baseline monitoring was conducted in the days prior to the start of construction to establish baseline behaviors of marine animals in the project vicinity. Baseline observations were established no earlier than 7 days before the first day of construction. The MMO established this baseline by surveying potential Levels A and B harassment zones on 2 separate days. Monitoring occurred during low and high tides during daylight hours. The data collected from baseline monitoring was used for comparison with results of monitoring during anticipated impact pile-driving activities.

WRA's marine mammal monitoring began with the start of in-water work on June 29, 2022 and work was completed on January 25, 2023. No in-water work occurred during the month of October 2022. Marine mammal monitoring occurred during all in water work, which consisted primarily of pile driving and pulling. MMOs began monitoring 30 minutes prior to the initiation of pile driving and continued monitoring for 30 minutes after pile driving was completed each day.

The location of pile driving was confined to the Project Area. MMOs situated themselves where they had the best vantage point of the pile driving site and associated shutdown zones each day of observing. MMOs adjusted their observation locations based on the location and nature of pile driving activities occurring any given day. Observations were made with a combination of the naked eye, spotting scope, binoculars, and distances were recorded with the aid of a handheld digital rangefinder. All field notes were recorded on datasheet forms. The raw data logs are included in Attachment C.

Results

Three species of marine mammals were observed while monitoring construction activities: common bottlenose dolphin, harbor seal, and California sea lion. Total observations by species included two common bottlenose dolphins, one harbor seal, and 323 California sea lions over the course of 44 days of monitoring.

Weather conditions were variable during monitoring periods, with cloud cover ranging from 0 to 100%, temperature ranging from 46 to 91°F, and general sea state from calm to rough. However, pile driving and removal was only performed when visibility was conducive to monitoring and did not limit the ability of monitors to observe marine mammals.

Marine mammal observations by month are detailed in Table 2, with the fewest observations in January and the most observations in August. For most marine mammal observations, the sex and age of the individuals were unknown. The specifics of each observation are detailed in the monitoring forms (Attachment C). The majority of marine mammals were sighted when pile driving was not occurring (Table 3).

Table 2. Marine Mammal Observations by Month

	California Sea Lion	Common Bottlenose Dolphin	Harbor Seal	Total Marine Mammals Observed
June	10	-	-	10
July	20	-	-	20
August	156	2	-	158
September	104	-	-	104
October	-	-	-	-
November	12	-	-	12
December	12	-	1	13
January	9	-	-	9

Table 3. Marine Mammals Observed during Pile Driving

Species	Active Pile Driving		Total
	No	Yes	
California sea lion	308	15	323
Common Bottlenose Dolphin	2	-	2
Harbor Seal	1	-	1
Total	**311**	**15**	**326**

Level A and Level B Take Estimates

Take estimates were based on days when both pile driving occurred and marine mammals were observed. Take estimates within the IHA period are detailed in Table 4, and explained in further detail below.

Table 4. Level A and Level B Take Estimates Within the IHA

Species	Total Observed #	Authorized Level A take	Level A Take Estimate	Authorized Level B Take	Level B Take Estimate
California Sea Lion	296	0	0	380	0
Common Bottlenose Dolphin	2	0	0	114	0
Harbor Seal	1	19	0	0	0

Level A

Level A take was assumed to occur in situations where the MMO identified a marine mammal within the Level A shutdown zones when pile driving was occurring. It was assumed that the entire Level A buffer zones were fully visible to MMOs, and thus no correction factor was applied to the Level A take estimates. Over the course of work, pile driving was delayed on 15 separate occasions due to the presence of marine mammals within the Level A shutdown zones. As work was stopped before marine mammals entered the shutdown zones, none of these instances met the definition of Level A take.

Level B

No level B take estimates occurred because behavioral changes in marine mammals were not observed.

323 California Sea Lions were observed. Two Common Bottlenose Dolphins were observed. One harbor seal was observed. No incidents of Level A or Level B harassment were observed during operations.

Hydroacoustic monitoring was conducted by Illingworth & Rodkin, Inc. Results collected from the monitoring are detailed in Appendix D.

Please do not hesitate to contact with questions, or if you require clarifications with any aspect of this report.

Appendix A. Figures

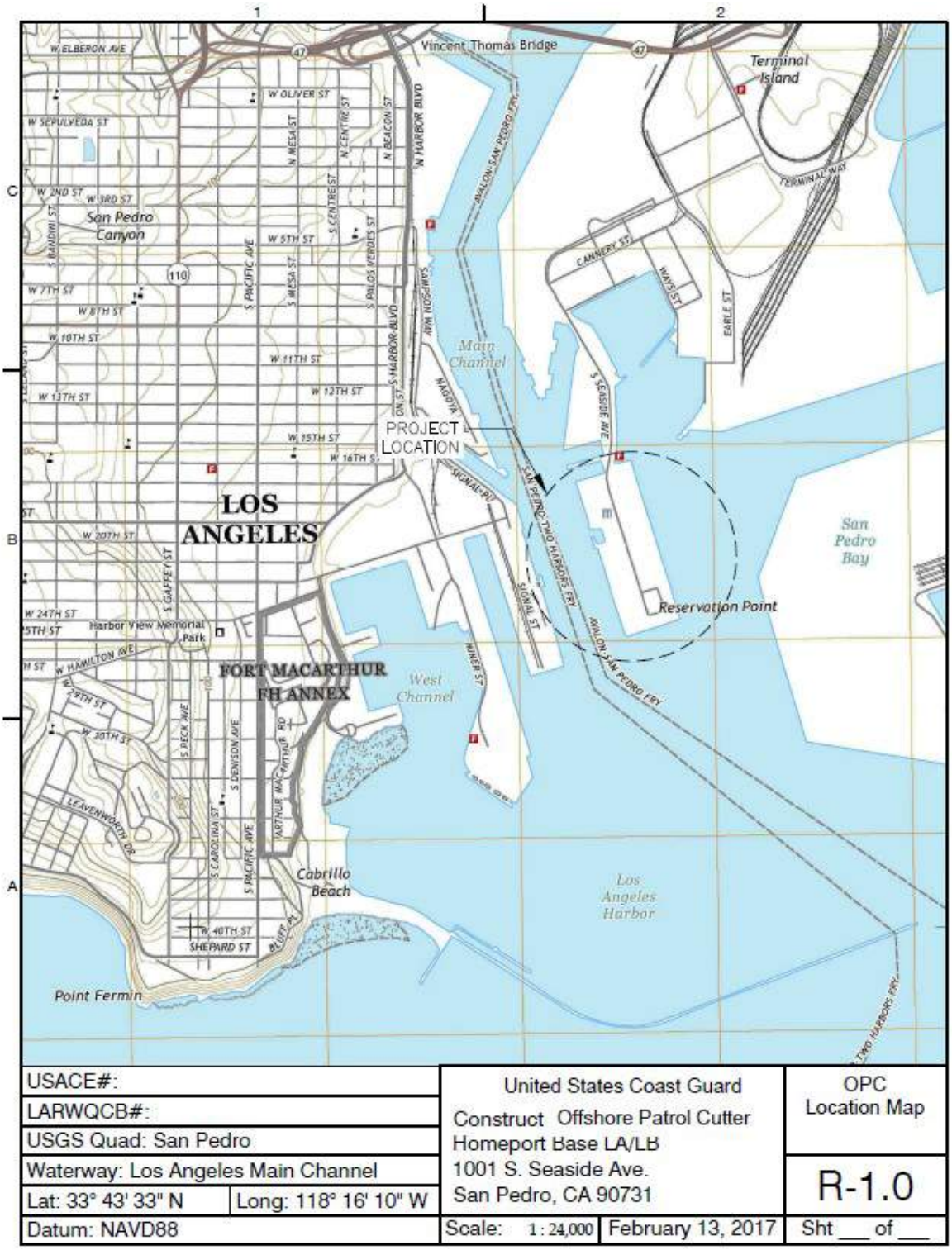


Figure 1. Map of the Offshore Patrol Cutter Project location at USCG Base LA/LB inside of the dotted circle and within the eastern edge of Los Angeles Harbor's Main Channel at Reservation Point

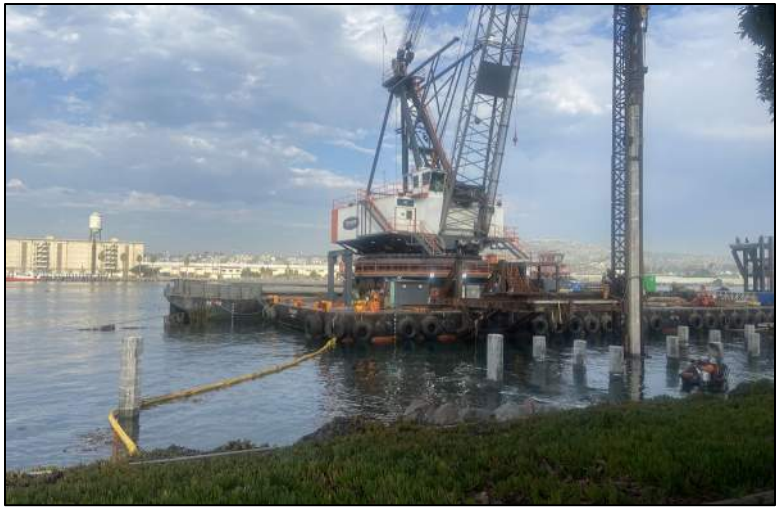
Figure 2. USCG Base LA/LB Offshore Patrol Cutter Homeport Base LA/LB Site Plan.

Appendix B. Site Photographs

Pile drive testing at the Project Site on June 29, 2022. Facing northwest.

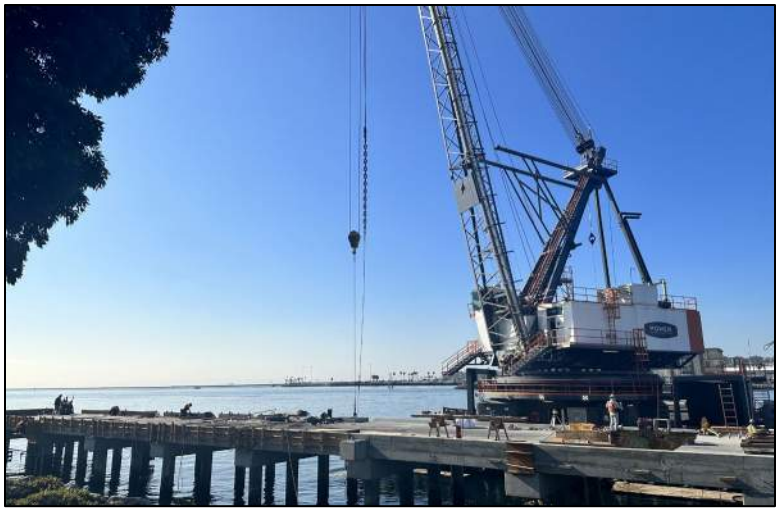
Pile drive testing at the Project Site on July 6, 2022. Facing south.

Dredging (in-water work) at the Project Site on August 29, 2022. Facing southwest.



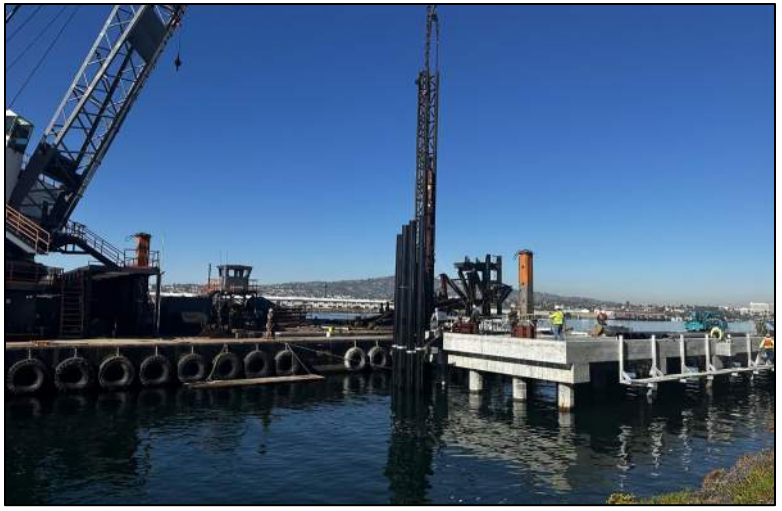
Pile driving at the Project Site on September 8, 2022. Facing west.

Fender pile pulling at the Project Site on November 3, 2022. Facing west.



Dredging at the Project Site on December 20, 2022. Facing southwest.

Pile driving at the Project Site on January 11, 2023. Facing west.



FRP piles installed at the Project Site on January 25, 2023. Facing west.

Appendix C. Monitoring Logs

Date: 6/29/22 Observer: patty jaramillo

General Weather AM ~~sun~~ cloudy Daily Start Time: 7:00am ~~1:30pm~~

PM sunny, warm Daily End Time: 8:15pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1· Beh	2· Beh	2· Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	9:01	CSL	1		40m	248°	U	U	~~west~~ S	SW					N	above water activities only
2	9:23	CSL	1		40m	270°	U	U	~~west~~ S	SW					N	
3	10:25	CSL	1		70m	208	U	U	~~west~~ S	SW					N	
4	11:02	CSL	1		300	228	U	U	E N	SW					N	
5	11:07	CSL	1		50	166	U	U	E N	SW					N	
6	11:18	CSL	1		50	205	U	U	E N	SW					N	
7	2:02	CSL	1		20	264	U	U	E N	SW					N	
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 6/30 Observer: patty j.

General Weather AM cloudy, 69 Daily Start Time: 9am

PM partly cloudy Daily End Time: 4:30 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	CSL	10:54	1		520	228	U	U	~~W~~S	SW					N	no pile driving occured
2	CSL	11:20	1		360	251	U	U	E N	SW					N	↓
3	CSL	12:30	1		340	221	U	U	~~W~~S	SW					N	dredging activities
4																
5																
6																
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RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 7/1 Observer: patty j.

General Weather AM cloudy, 64 Daily Start Time: 7:30am

PM sunny Daily End Time: 3:00 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	10.12	CSL	1	-	50	284	U	U	~~E~~ N	SW					Y	dredging for rocks
2																
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RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 7/5 Observer: MSN

General Weather AM partly cloudy Daily Start Time: 0700

PM partly cloudy Daily End Time: ~~1000~~ 1115

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:08	CSL	1	-	10	230	M	Adult	S	F				~~F~~	N	no active in-H2O work
2	9:15	CSL	2	-	40	222	F,F	adult	S						N	no active in-H2O work.
3	10:57	CSL	1	-	80		M	adult	S	F					N	no active in-H2O work
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RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 7/6 Observer: patty J

General Weather AM cloudy, 64 Daily Start Time: 7:30am

PM sunny Daily End Time: 4:00pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	9:24	CSL	1	—	100	242	U	U	N	SW					N	no in-water activities
2	2:56	CSL	1	—	30	108	U	U	N	SW					N	pile driving
3	3:44	CSL	1	—	50	247	U	U	N	SW					~~Y~~N	no in-water activities
4																
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PWS	Pac White-sided Dolphin										

Date: 7/7 Observer: PJ

General Weather AM sunny, 65 Daily Start Time: 7:45

PM sunny, 67 Daily End Time: 3:30

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:07	CSL	2	—	340	307	M PF	A	N	SW			—	—	N	no in-H2O activities
2																
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PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 7/11 Observer: MOW

General Weather AM 60° Cloudy Daily Start Time: 0700

PM cloudy Daily End Time: 1000

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	0730	CSL	1		S	S	♀	adult							N	no in the activity
2																
3																
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PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Sheet ___ of ___

Date: 7/18 Observer: PJ

General Weather AM cloudy | 67 Daily Start Time: 6:30 am

PM sunny, 72 Daily End Time: 4:20 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (of) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	6:37	CSL	2		10	330			N	SW					N	dredging
2	10:55	CSL	1		120	310			N	SW					N	
3	10:57	CSL	1		200	200			S	SW					N	
4	11:50	CSL	1		25	274			N	SW					N	
5	12:44	CSL	1		50	310			N	SW					N	
6	1:39	CSL	1		220	220			S	SW					N	
7	2:05	CSL	1		250	275			S	SW					N	
8	2:23	CSL	1		300	315			S	SW						
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RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 8/16 Observer: PJ

General Weather AM sunny, 66 Daily Start Time: 6:30am

PM sunny, 74 Daily End Time: 4:30pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:03	CSL	1		100	224			S	SW					N	~~pod of 4 adults~~ no in water were at time of observation
2	7.43	CSL	1		10	204			S	SW					N	
3	8:14	CSL	1		20	208			N	SW					N	
4	8:41	CSL	1		100	250			N	SW					N	
5	8:44	CSL	1		30	205			S	SW					N	
6	8:45	CSL	1		30	205			S	SW					N	
7	8:50	CSL	1		100	230			N	SW					N	
8	2:46	CSL	1		80	224			W	SW					N	
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RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 8/17 Observer: PJ

General Weather AM sunny, 67 Daily Start Time: 7am

PM sunny, windy, 73 Daily End Time: 5:15 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:08am	CSL	1		70	224			S	SW					N	no in H2O act.
2	8:48	CSL	1		100	230			N	SW						pile driving
3	10am	CSL	1		70	240			S	SW						no in H2O act
4	10:20	CSL	1		30	210			S	SW						
5	10:40	CSL	1		50	240			S	SW						
6	10:49	CSL	1		50	190			N							
7	11:24	CSL	1		70	226			N							
8	15:28	CSL	1		50	228			S							
9	4:59	CSL	1		50	92			N							
10	5:00	CSL	1		50	146			S							
11																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 8/18 Observer: PT

General Weather AM partly cloudy, 60s Daily Start Time: 7am

PM clear, sunny, 70 Daily End Time: 4:15 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:38	CSL	1		110	248			N	SW					N	no in-water pile driving
2	7:57	CSL			200	226			N							
3	8:15	CSL			50	150			S							
4	8:49				50	222			S							
5	9:00				350	226			N							
6	9:14				100	190			S							
7	9:23				90	270			S							
8	1:37				200	244			S							
9	2:46				30	204			S							
10																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 8/22 Observer: Eliza Schlein

General Weather AM 67, cloudy Daily Start Time: 7:15 am

PM 82, partly cloudy Daily End Time: 3:15 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:27	CSL	1	0	10	169	Unk	Unk	120	SW						no in water pile driving
2	8:07	CSL	1	0	180	177	Unk	Unk	331	SW						no in water pile driving
3	8:19	CSL	1	0	5	162	Unk	Unk	136	SW						
4	9:26	CSL	1	0	75	192	M	Unk	322	SW						
5	9:29	CSL	1	0	10	175	M	adult	319	SW						
6	9:37	CSL	1	0	50	166	M	adult	300	SW						
7	10:03	CSL	1	0	10	151	"	"	279	SW						
8	10:23	CSL	1	0	100	285	Unk	Unk	148	SW						
9	10:31	CSL	1	0	110	186	Unk	Unk	275	P						
10	10:34	CSL	1	0	10	197	M	unk	336	SW						no pile driving within 15 min of PD
11	11:20	CSL	1	0	15	217	Unk	Unk	304	SW					Y-12:22	no in water pile driving
12	12:16	CSL	1	0	5	207	F	adult	160	P						
13	12:37	CSL	1	0	40	198	F	adult	304	SW					Y-12:53	
14	12:40	CSL	1	0	20	178	M	adult	299	L						
15	1:29	CSL	1	0	30	296	F	unk	312	SW						with above observed female
16	1:33	CSL	1	0	5	157	M	adult	172	SW,L						no in water pile driving
17	1:55	CSL	1	0	20	165	M	adult	285	SW					Y-2:18	
18	2:11	CSL	1	0	25	217	M	adult	169	SW,P						during driving. Driving packed after done for day
19	2:42	CSL	1	0	40	145	Unk	Unk	145	SW						
20	3:30	CSL	1	0	50	127	Unk	Unk	177	SWW						

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 8/23 Observer: Eliza Schlein

General Weather AM 66, cloudy Daily Start Time: 6:56 am

PM 74, sunny Daily End Time: 17:15

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:08	CSL	1	0	45	165	F	Unk	128	P						No in water pile driving
2	7:13	CSL	1	0	150	190	Unk	Unk	325	SW						
3	7:30	CSL	1	0	90	223	Unk	Unk	148	SW						
4	7:40	CSL	1	0	120	190	Unk	Unk	339	P, SW						
5	7:56	CSL	1	0	70	162	Unk	Unk	92	SW						Leaving area after soft start
6	8:07	CSL	1	0	180	314	Unk	Unk	141	SW, SW						pile driving still paused
7	8:27	CSL	1	0	65	232	M	adult	307	SW						no in water pile driving
8	9:09	CSL	1	0	110	284	Unk	Unk	335	SW						
9	9:40	CSL	1	0	50	214	Unk	Unk	297	SW						
10	9:48	CSL	1	0	40	189	Unk	Unk	160	SW						
11	10:05	CSL	1	0	50	214	M	adult	313	SW						
12	10:14	CSL	2	0	10	253	M, F	adult	192	SW, L						
13	10:35	CSL	1	0	35	177	Unk	Unk	264	SW						
14	10:43	CSL	2	0	0	215	Unk	Unk	143	PP						
15	11:00	CSL	1	0	80	304	Unk	Unk	140	SW						Light before soft start while paused
16	11:19	CSL	1	0	20	201	M	adult	328	SW						During diving, work stopped
17	11:53	CSL	1	0	70	212	Unk	Unk	310	SW						No in water pile driving
18	13:19	CSL	1	0	40	195	Unk	Unk	288	SW						
19	13:46	CSL	1	0	40	200	Unk	Unk	304	SW						
20	13:58	CSL	1	0	20	183	F	Unk	149	SW						

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 8/23 Observer: Eliza Schlein

General Weather AM 66, cloudy Daily Start Time: 6:56

PM 74, sunny Daily End Time: 17:15

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	15:34	UDOL	1	0	90	200	Unk	Unk	206	PP						No in water pile driving
2	16:04	CSL	1	0	130	285	M	Adult	148	SW						During driving. Wake patrol
3	16:45	CSL	1	0	30	206	Unk	Unk	331	SW						After pile driving completed
4																
5																
6																
7																
8																
9																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 8/24 Observer: Eliza Schlein

General Weather AM 69, cloudy Daily Start Time: 7AM

PM 74, partly cloudy Daily End Time: 4:34 PM

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:29	CSL	1	0	150	298	Unk	Unk	334	SW						No in water work
2	8:04	CSL	1	0	15	275	M	adult	306	SW						
3	8:36	CSL	1	0	20	152	Unk	Unk	160	SW						No in water pile driving
4	9:00	CSL	2	0	180	324	Unk	Unk	336	SW						during pause in driving - pause extended 1-2 more times during pause to keep pile in place
5	9:09	CSL	1	0	30	186	Unk	Unk	329	SW						
6	9:35	CSL	1	0	100	197	Unk	Unk	296	SW						During pile driving, work stopped
7	10:37	CSL	1	0	20	195	Unk	Unk	164	SW						No in water pile driving
8	10:58	CSL	1	0	150	223	M	adult	325	SW						
9	11:42	CSL	2	0	50	200	Unk	Unk	321	SW						During driving, work stopped
10	13:09	CSL	1	0	20	292	Unk	Unk	140	SW						No in water pile driving
11	13:09	CBD	2	0	70	226	Unk	Unk	319	SW					Y-13:13	
12	13:11	CSL	1	0	30	170	M	adult	317	SW						
13	13:46	CBD	2	0	10	207	Unk	Unk	310	SW						
14	14:38	CSL	2	0	70	174	Unk	Unk	293	SW					Y-14:41	
15	14:45	CSL	1	0	20	218	M	Unk	297	SW						
16	14:56	CSL	1	0	80	166	Unk	Unk	228	SW						
17	15:14	CSL	2	0	20	193	Unk	Unk	308	SW						
18	15:33	CSL	1	0	40	190	M	Unk	258	SW						
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet 1 of 1

Date: 8/25/22 Observer: Eliza Schlein

General Weather AM 69, Partly Cloudy Daily Start Time: 7AM

PM 76, Sunny Daily End Time: 16:48

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:26	CSL	1	0	25	214	Unk	Unk	281	SW						No in water pile driving
2	7:35	CSL	1	0	140	295	Unk	Unk	332	L	SW					
3	7:43	CSL	1	0	30	174	Unk	Unk	110	SW					Y-7:47	
4	7:47	CSL	1	0	70	186	M	Unk	153	SW						I below 10 min in the keep location
5	7:56	CSL	1	0	20	194	Unk	Unk	176	SW						
6	8:30	CSL	1	0	80	295	Unk	Unk	135	SW						During driving Work stopped
7	8:34	CSL	1	0	40	202	Unk	Unk	306	SW						During pause in work. Pause ended
8	9:01	CSL	1	0	40	209	Unk	Unk	312	SW						No in water pile driving
9	9:07	CSL	1	0	10	155	M	Unk	124	SW						
10	9:26	CSL	1	0	35	213	Unk	Unk	305	SW						
11	9:36	CSL	1	0	10	218	M	adult	294	SW						
12	9:39	CSL	1	0	80	210	Unk	Unk	316	SW					Y-9:43	
13	9:52	CSL	1	0	20	224	M	juv	304	SW						
14	10:07	CSL	1	0	40	180	Unk	Unk	143	SW						
15	11:18	CSL	1	0	20	212	Unk	Unk	173	SW						
16	15:12	UDOL	1	0	150	300	Unk	Unk	147	SW						During in water rock removal
17	15:47	CSL	1	0	30	211	Unk	Unk	172	SW						
18	16:15	CSL	1	0	20	222	Unk	Unk	161	SW						
19	16:14	PHS	1	0	40	155	Unk	Unk	305	SW						
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 8/29 Observer: PJ

General Weather AM Lo 8, cloudy Daily Start Time: 7 am

PM 71, sunny Daily End Time: 3:45 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:31	CSL	1	0	250	186			N	SW			–		N	no in H2O work
2	7:38	CSL	↓	↓	50	182			S	↓			↓		N	no in H2O work
3	8:02	CSL			20	184			S						N	stopped pile dr.
4	8:46	CSL			870	170			S						Y	no in H2O work
5	11:30	CSL			50	226			N						N	stopped pile dr.
6	11:56	CSL			150	288			S						N	no in H2O work
7	3:35	CSL			150	200			N							no in H2O work
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 8/30 Observer: PJ

General Weather AM 66, ~~61~~ sunny Daily Start Time: 6:30

PM 77, sunny Daily End Time: 5pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	6:57	CSL	1		60	266			S	SW					N	no in H2O work
2	7:04	CSL	1		200	208			S	SW					N	
3	7:15	CSL	1		70	310			N	LO	SW				Y	
4	7:17	CSL	1		100	324			N	LO	SW					
5	7:18	CSL	2		400	290			N	SW					N	
6	7:27	CSL	1		50	324			S	SW					N	
7	7:40	CSL	1		200	230			S	SW					N	
8	7:51	CSL	2		100	202			S	SW					N	
9	9:35	CSL	1		70	205			N	SW					N	
10	10:05	CSL	1		100	204			S	SW					N	
11	10:27	CSL	2		200	203			N	SW					Y	
12	10:30	CSL	1		150	243			N	SW					N	
13	10:32	CSL	1		220	200			N	SW					N	obvs. leaving channel
14	11:46	CSL	1		20	170			S	SW					N	no in H2O work
15	2:17	CSL	1		200	263			N	SW					N	leaving channel
16	3:54	CSL	1		80	92			S	SW					N	after pile drive
17	4:40	CSL	1		120	250			N	SW					N	after pile dr.
18	4:52	CSL	1		20	284			S	SW						
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 8/31 Observer: PJ

General Weather AM sunny, 68° Daily Start Time: 7am

PM sunny, 92 Daily End Time: 12:30pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:14	CSL	1		150	248			S	SW					N	no in H_2O act.
2	7:17	CSL	1		50	323			S	SW					N	
3	7:19	CSL	4		100	325			N	SW					Y	
4	8:00	CSL	3		250	190			S	SW					N	
5	8:16	CSL	1		100	200			N	SW					N	
6																crane leaves
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin
PWS	Pac White-sided Dolphin								

PWH	Pilot Whale
ULWH	Unk Large Whale
UPIN	Unknown Pinniped

Sheet ___ of ___

Date: 9/7 Observer: DJ

General Weather AM sunny, 72° Daily Start Time: 7am

PM cloudy, 84° Daily End Time: 4:30pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:05	CSL	1		220	194			N	SW					N	no in H2O act.
2	8:14	CSL	1		200	348			N	SW					N	↓
3	8:18	CSL	1		100	340			N	SW					N	
4	8:26	CSL	2		250	190			N	SW					N	
5	8:32	CSL	1		300	48			N	SW					N	
6	10:49	CSL	1		150	304			S	SW					N	
7	11:46	CSL	1		100	190			S	SW					N	obvs leaving channel
8	12:51	CSL	1		50	184			S	SW					N	no in H2O act.
9	2:10	CSL	1		50	190			S	SW					N	↓
10	2:42	CSL	2		200	244			S	SW					N	
11	4:09	CSL	1		100	224			N	SW					N	
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 9/8 Observer: DJ

General Weather AM cloudy, ~~80°~~ to, 73° Daily Start Time: 7am

PM cloudy, 90° Daily End Time: 5pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:51	CSL	1		70	164			S	SW					N	no in H2O act
2	10:27	CSL	1		50	243			S	SW					N	
3	11:27	CSL	2		200	194			N						N	
4	11:33	CSL	2		250	230			N						N	
5	11:45	CSL	1		150	210			N						N	
6	12:05	CSL	1		120	264			S						N	
7	2:22	CSL	3		100	246			N						N	pile start stopped
8	3:45	CSL	1		300	190			S						N	no in H2O act
9	3:50	CSL	1		150	200			S						N	
10	4:12	CSL	1		250	206			N						N	
11	4:45	CSL	1		270	181			S	SW					N	no in H2O act
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 9/9 Observer: MOW

General Weather AM Partly Cloudy Daily Start Time: 0700

PM 100% CC, rain Daily End Time: 1520

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	0734	CSL	1		3	200	F		E	SW						no in H2O Activity
2	0736	CSL	1		12	100	M		N	SW						"
3	0801	CSL	2		175	310	2F		N	SW						"
4	0807	CSL	4		20	190	4F		N	SW						"
5	0844	CSL	1		115	235	M		N	SW						"
6	1047	CSL	1		55	320	M		W	SW						"
7	1049	CSL	1		10	200	M		N	SW						"
8	1100	CSL	1		5	240	M		N	SW						pile driving halted
9	1247	CSL	1		35	220	M		S	SW						no in H2O Activity
10	1450	CSL	1		130	122	M		S	SW						
11																
12																
13																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 9/12 Observer: PJ

General Weather AM 8am, part. cloudy, 55 Daily Start Time: 8am

PM clear, 78 Daily End Time: 5pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:01	CSL	1		70	202			N	SW					N	no in H2O
2	8:02		1		200	187			N	SW						
3	8:07		1		60	208			S	SW						
4	8:17		1		70	240			S	SW						
5	8:42		2		400	312			N	SW						
6	9:24		1		50	280			N	SW						
7	11:27		1		70	228			SW	SW						
8	11:38		1		60	187			NS							
9	1:10		1		220	230			SN							
10	1:18		1		150	192			S							halted work til 3:53
11	2:07		1		230	208			S							
12	3:45		3		180	180			N	SW						
13																
14																
15																
16																
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18																
19																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 9/13 Observer: PJ

General Weather AM clear, 70 Daily Start Time: 7am

PM clear, 78 Daily End Time: 2:39 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:30	CSL	1		140	106			N	SW					N	no in HBO
2	10:30	CSL	1		80	246			N	therm					↓	↓
3	10:40	CSL	1		100	210			N	SW						
4	10:50	CSL	1		150	190			S	SW						
5	3:30	CSL	1		100	240			N	SW						
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 9/14 Observer: PJ

General Weather AM part. cloudy, 70 Daily Start Time: 7am

PM part. cloudy, 79 Daily End Time: 4:45pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (rp) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:38	CSL	1		100	207			N	SW					N	no in the
2	8:41	CSL	1		200	180			S	↓					↓	↓
3	12:3	CSL	1		50	90			S							
4	1:30	CSL	1		130	~~220~~			N							
5	1:35	CSL	1		300	170			N							
6	4:30	CSL	1		250	200			S							
7																
8																
9																
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18																
19																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 9/15 Observer: PJ

General Weather AM cloudy, 71 Daily Start Time: 7am

PM sunny, 76 Daily End Time: ~~4~~ 4pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	~~[illegible]~~	~~[illegible]~~	~~1~~		~~200~~				N	SW					N	no in H2O act.
2	7:05	CSL	1		70	191			N							
3	7:30	CSL	1		100	180			S							
4	8:12	CSL	1		300	200			N							
5	11:04	CSL	1		200	107			N							
6	11:06	CSL	1		300	140			S							
7	11:25	CSL	1		150	210			N							
8	11:45	CSL	1		220	200			S							
9	12:07	CSL	1		250	181										
10																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 9/19 Observer: DJ Daily Start Time: 7am

General Weather AM sunny, 64 Daily End Time: 4:18pm

PM sunny, 75

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) Ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:10	CSL	1		300	125			S	SW					N	no initial act
2	8:19	CSL	1		320	305			N							
3	8:25	CSL	2		200	191			N							
4	10:30	CSL	1		250	200			N							obs. leaving before pile dr.
5	10:39	CSL	1		150	151			S	SW						after pile dr.
6	3:15	CSL	1		70	170			N	SW						
7	4:08	CSL			150	170										
8																
9																
10																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 9/20 Observer: PJ

General Weather AM sunny, 66 Daily Start Time: 7AM

PM sunny, 77 Daily End Time: 5:15 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:14	CSL	1		150	181			N	SW					N	no initial act.
2	8:21	CSL	1		180	190			S	SW					N	
3	7:09	CSL	1		100	210			N						N	
4	9:05	CSL	1		200	200			S						N	
5	9:30	"	2		70	286			N						N	
6	11:30	"	1		90	231			N						N	
7	12:4	"	1		200	205			S						N	
8	11:45	"	"		300	140			S						←	stopped work
9	4:15	↓	3		100	170			N	↓						
10																
11																
12																
13																
14																
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16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 9/21 Observer: PJ

General Weather AM sunny, 69 Daily Start Time: 8:30

PM sunny, 75 Daily End Time: 4:00pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:54	CSL	1		80	182			N	SW					N	no in the act
2	9:20		1		70	210			N							
3	10:00		2		200	210			N							
4	10:14		1		100	242			S							
5	10:24		1		20	244			S							
6	10:28	↓	1		100	206			N	↓					↓	↓
7																dredging
8																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 11/3 Observer: PJ

General Weather AM cold, windy 15g Daily Start Time: 7:30am

PM cold, windy, 63 Daily End Time: 4pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	10:05	CSL	2		80	210			S	SW					N	no in H2O alt
2																
3																
4																
5																
6																
7																
8																
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11																
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18																
19																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 11/4 Observer: PJ

General Weather AM sunny 15S Daily Start Time: 7am

PM sunny 10S Daily End Time: 12:50

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:07	CSL	1		150	210			N	SW					N	no in H20 act
2																
3																
4																
5																
6																
7																
8																
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18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 11/10 Observer: PJ

General Weather AM sunny, 50 Daily Start Time: 6:30

PM sunny 68 Daily End Time: 1:00pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:02	CSL	1		100	210			N	SW					N	no in H2O act
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 11/28 Observer: PJ

General Weather AM cloudy, 54 Daily Start Time: 6:30 am

PM partly cloudy, 64 Daily End Time: 1:00 pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (of) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:06	CSL	1		180	210			N	SW					N	no in H2O activity
2	10:20	CSL	1		190	200			N	SW					N	no in H2O activity
3		CSL	1													
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ____ of ____

Date: 11/29 Observer: PJ

General Weather AM 7am, cloudy, 54° Daily Start Time: 7am

PM 64°, cloudy Daily End Time: 12pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:52	CSL	1		120	187			~~S~~ N	SW					N	no in H2O work
2	8:27	CSL	1		210	160			S	SW						no in H2O work
3	8:38	CSL	1		220	200			S	SW						no in H2O work
4	9:00	CSL	1		400	171			S	SW						obvs outside work buffer
5	9:38	CSL	1		150	190			N	SW						no in H2O work
6	11:56	CSL	1		100	191			N	SW					↓	no in H2O work
7																
8																
9																
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11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
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RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 12/5 Observer: PJ

General Weather AM cloudy, 55° Daily Start Time: 6:30am

PM partly cloudy, 61° Daily End Time: 3:15pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:41	CSL	1		200	191			N	SW					N	no in H20 work
2	9:00	CSL	1		400	210			N	SW					N	obs. outside batter
3	1:33	CSL	1		150	18			N	SW					N	no in H20 work
4																
5																
6																
7																
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19																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
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RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 12/8 Observer: PJ

General Weather AM sunny, 46° Daily Start Time: 6:30am

PM sunny, 63° Daily End Time: 11:15am

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:12	CSL	1		300	224			N	SW					N	no in the H2O work
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
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14																
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19																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 12/12 Observer: MS

General Weather AM Cloudy, 48 Daily Start Time: 7am

PM Cloudy Daily End Time: 11:50am

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7:48	CSL	1		125	134			N	SW						no in the act
2	9:00	CSL	1		100	248			S	SW						↓
3	9:11	HS	1		50	250			S	SW						
4	10:43	CSL	1		125	290			S	SW						
5																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 12/21 Observer: PJ

General Weather AM sunny, 47° Daily Start Time: 6:30am

PM sunny, 67 Daily End Time: 5pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	7am	CSL	1		50	267			N	SW					N	no in the act
2	7:10	CSL	2		300	185			N	SW					N	↓
3	7:33	CSL	1		80	265			N	SW					N	↓
4	7:34	CSL	1		250	287			N	SW					N	↓
5																
6																
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19																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 11/4/23 Observer: MS

General Weather AM 59, cloudy, rain Daily Start Time: ~~7am~~ 10:30am

PM cloudy Daily End Time: 4:30pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	1:23	CSL	1		300	264			N	feed					N	no in H2O work
2	1:42	CSL	1		225	227			N	feed					N	↓
3	3:48	CSL	1		200	243			S	SW					N	↓
4																
5																
6																
7																
8																
9																
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Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 1/11/23 Observer: PJ

General Weather AM cloudy, 50 Daily Start Time: 8am

PM cloudy: 60 Daily End Time: 3pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	8:30	CSL	1		300	140			N	SW					N	no in the act
2	9:15	CSL	1		110	300			N	SW					N	
3	9:45	CSL	2		250	210			S	SW					N	
4	9:51	CSL	1		200	250			N	SW					N	
5																
6																
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PWS	Pac White-sided Dolphin										

Sheet ___ of ___

Date: 1/10/23 Observer: PJ

General Weather AM cloudy, 55 Daily Start Time: 8:30 am

PM cloudy, 57 Daily End Time: 12:30 pm

Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1° Beh	2° Beh	2° Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
9:02	CSL	1		50	181			S	SW					N	no in the act.
10:15	CSL	1		120	190			N	SW					N	no in the act.

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CBD	Coastal B'nose Dolphin	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin										

Date: 1/25 Observer: RJ

General Weather AM Sunny 47 Daily Start Time: 7:30am

PM Sunny, 56 Daily End Time: 11:30am

	Time	Species	# of Ind Water	# of Ind HO	Dist (m) ft	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
1	9:21	CSL	2		200	314			S	SW					N	no in the work
2															N	no in the work
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

Species Abbreviations

CSL	CA Sea Lion	CSL DD	Dead CSL	ELS	N. Elephant Seal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
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PWS	Pac White-sided Dolphin										

USCG Los Angeles Wharf
2022

		Description of Work	Notes for Pile Installation Days Only			Weather					Surface Water Visual Observations								Name of Observer
Date	Time	In Water Work Activity	Time Initiate Pile Installation	Time Complete Pile Installation	Pile No. or Location	Tide Level ft	% Cloud Cover	Temp.	Visibility	Wind Speed & Direction (mph)	Floating Particles Y/N	Suspended Materials Y/N	Sheen Grease or Oil Y/N	Water Discoloration Y/N	Odor Y/N	Turbidity Plume & Length of Plume Y/N	Silt Curtain in Good Condition Y/N	Turbidity Notes/Actions Taken	
6/29	6:30 pm	pile driving	6:30pm	7:13pm	1	4.1ft	60	66	high	NE	N	N/A	N	N	N	N/A	N/A	N	P.J
7/6	12:27	pile driving	12:27 pm	3:30	~~6~~	4.47ft	2	68	high	NE 14 N	N/A	N	N	N	N	N/A	N/A	N	PJ
7/7	9:04 am	pile driving	9:04	10:49	~~5~~	1.62	2	66	high	NE/8	N	-	N	N	N	NA	N/A	N	PJ
8/16	6:30	pile dr.	9:29	10:25	7	2.7	3	67	high	4mph SW	N	N	N	N	N	N/A	N/A	N	PJ
8/16	6:30	pile dr.	12:33pm	1:08		5.0	5	70			N	N	N	N	N	N/A	N/A	N	PJ
8/16	6:30	pile dr	3:30	4:00		3.9	60	74		11mph NE	N	N	N	N	N	N/A	N/A	N	PJ
8/17	7am	pile dr	8:34	9:38		1.9	15	67		4mph NE	N	N	N	N	N	N/A	N/A	N	PJ
8/17	7am	pile dr	12:30	1:19		4.7	2	70			N	N	N	N	N	N/A	N/A	N	PJ
8/17	7am	pile dr	3:20	4:45		4.5	5	73		12mph E	N	N	N	N	N	N/A	N/A	N	PJ
8/18	7am	pile dr.	~~9:20~~ 7:56	~~9:47~~ 9:20		2.23	2	70	high	8mph ~~SE~~ E	N	N	N	N	N	N/A	N/A	N	PJ
8/18	7am	pile dr.	12:18	1:33		3.67	2	71	high	8mph NE	N	N	N	N	N	N/A	N/A	N	PJ
8/22	7am	pile driving	10:49	11:17			2	67	high	7mph E	N	N	N	N	N	N/A	N/A	N	ELS
8/22	7am	pile driving	14:36	15:11		3.29	2	71	high	10mph E	N	N	N	N	N	N/A	N/A	N	ELS
8/23	6:56 AM	pile driving	7:56	8:52		3.58	95	67	high	1mph NW	N	N	N	N	N	N/A	N/A	N	ELS
8/23	6:56 AM	pile driving	11:36	12:18		3.35	10	72	high	6mph NE	N	N	N	N	N	N/A	N/A	N	ELS
8/23	6:56 AM	pile driving	14:13	14:42		2.76	5	73	high	11mph NE	N	N	N	N	N	N/A	N/A	N	ELS
8/23	6:56 AM	pile driving	15:49	16:29		3.48	5	74	high	10mph NE	N	N	N	N	N	N/A	N/A	N	ELS
8/24	7AM	pile driving	8:54	9:57		3.99	95	69	high	5mph NW	N	N	N	N	N	N/A	N/A	N	ELS
8/24	7AM	pile driving	11:16	12:09		3.62	75	72	high	7mph N	N	N	N	N	N	N/A	N/A	N	ELS
8/24	7AM	pile driving	14:02	14:32		2.47	10	76	high	9mph N	N	N	N	N	N	N/A	N/A	N	ELS
8/24	7AM	pile driving	15:48	16:04		2.87	5	76	high	9mph N	N	N	N	N	N	N/A	N/A	N	ELS
8/25	7AM	pile driving	8:13	8:55		3.57	5	71	high	1mph W	N	N	N	N	N	N/A	N/A	N	ELS
8/~~30~~ 31	7am	pile dr	8:32	9:08		2.67	~~60~~	68	high	2mph SE	N	N	N	N	N	N/A	N/A	N	PJ

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2022

Date	Time	Description of Work: In Water Work Activity	Notes for Pile Installation Days Only: Time Initiate Pile Installation	Time Complete Pile Installation	Pile No. or Location	Weather: Tide Level	% Cloud Cover	Temp.	Visibility	Wind Speed & Direction (mph)	Surface Water Visual Observations: Floating Particles Y/N	Suspended Materials Y/N	Sheen Grease or Oil Y/N	Water Discoloration Y/N	Odor Y/N	Turbidity Plume & Length of Plume Y/N	Silt Curtain in Good Condition Y/N	Turbidity Notes/Actions Taken	Name of Observer
8/30	7am	pile dr.	10:55	11:51		4.59 ~~2.67~~	0	75	high	6mph NE	N	N	N	N	N	~~N/A~~	N/A	N/A	PJ
8/30	7am	pile dr.	3:56	4:30		2.65	0	74	high	15mph NE	N	N	N	N	N	N	N/A	N/A	PJ
9/7	7am	pile dr	10am	11:40		4.3	2	78	high	1mph N	N	N	N	N	N	N/A	N/A	N/A	PJ
9/8	7am	pile dr.	8:24	9:45		4.6	80	74	high	6mph W	N	N	N	N	N	N	N/A	N/A	PJ
9/8	7am	pile dr.	11:38	12:23		3.29	40%	83	high	2mph NW	N	N	N	N	N	N/A	N/A	N/A	PJ
9/9	7am	pile driving	11:45	~~12:06~~		3.07	100%	91	high	3-5mph	N	N	N	N	N	~~N/A~~	N/A	N/A	MJW
9/12	8am	pile dr	8:24	9:18		3.34	55%	74	high	1mph SE	N	N	N	N	N	N/A	N/A	N/A	PJ
9/12	[redacted]	pile dr.	3:02pm	4:30 pm		2.18	100%	81	high	14mph E	N	N	N	N	N	N/A	N/A	N/A	PJ
9/13	7am	pile dr.	8:51	10:26		3.57	100%	72	high	3mph NW	N	N	N	N	N	N/A	N/A	N/A	PJ
9/14	7am	pile dr.	12:37pm	2:09		5.32	5%	77	high	7mph N	N	N	N	N	N	N/A	N/A	N/A	PJ
9/14	7am	pile dr.	9:22	10:34		3.41	55	71	high	5mph NW	N	N	N	N	N	N/A	N/A	N/A	PJ
9/19	7am	pile dr	9:08	10:12		3.85	5	67	high	2mph SW	N	N	N	N	N	N/A	NA	N/A	PJ
9/19	7am	pile dr.	11:21	12:14pm		3.39	5	73	high	5mph NE	N	N	N	N	N	N/A	N/A	N/A	PJ
9/19	7am	pile dr.	1:48	2:26pm		3.58	5	75	high	10mph NE	N	N	N	N	N	N/A	N/A	N/A	PJ
9/19	7am	pile dr.	3:06	3:48.		4.06	5	75	high	10mph NE	N	N	N	N	N	N/A	N/A	N/A	PJ
9/20	7am	pile dr.	7:47	~~8:58~~ 8:58		4.09	10	67	high	3mph S	N	N	N	N	N	N/A	N/A	N/A	PJ
9/20	7am	pile dr.	10:13	10:59		3.74	20	72	high	3mph NE	N	N	N	N	N	N/A	N/A	N/A	PJ
9/20	7am	pile dr.	12:42	1:24 pm		2.97	45	77	high	9mph NE	N	N	N	N	N	N/A	N/A	N/A	PJ
11/ ~~8~~ 7	7am	pile dr.	10:44	12pm		2.8	50	60	high	3 SW	N	N	N	N	N	N/A	N/A	N/A	PJ
11/10	6:30	pile dr.	8:58	12:29		6.1	1%	50	high	4 SW	N	N	N	N	N	N/A	N/A	N/A	PJ
11/28	6:30	pile dr.	8:58	10:01		5.7	80%	57	high	4 NW	N	N	N	N	N	N/A	N/A	N/A	PJ
11/29	7am	pile drive	8:42	9:27		3.52	85	58	high	6 W	N	N	N	N	N	N/A	N/A	N/A	PJ
12/5	6:30	pile dr.	9:30	11:16		4.2	50	58	high	8 NE	N	N	N	N	N	N/A	N/A	N/A	PJ

USCG Los Angeles Wharf
2022

		Description of Work	Notes for Pile Installation Days Only			Weather					Surface Water Visual Observations									Name of Observer
Date	Time	In Water Work Activity	Time Initiate Pile Installation	Time Complete Pile Installation	Pile No. or Location	Tide Level	% Cloud Cover	Temp.	Visibility	Wind Speed & Direction (mph)	Floating Particles Y/N	Suspended Materials Y/N	Sheen Grease or Oil Y/N	Water Discoloration Y/N	Odor Y/N	Turbidity Plume & Length of Plume Y/N	Silt Curtain in Good Condition Y/N	Turbidity Notes/Actions Taken		
12/8	6:30	pile dr.	7:48	9:39		6.1	1%	46	high	4 SW	N	N	N	N	N/A	N/A	N/A	N/A		PJ
12/12	7am	pile dr	8:38	11:50		4.8	100	48	high	0 mph	N	N	N	N	N/A	N/A	N/A	N/A		MS
~~12/13~~	~~5:30~~	~~pile dr~~																		
1/5	7am	pile dr	10:51	2:04		2.3	80	62	high	14 SW	N	N	N	N	N/A	N/A	N/A	N/A		MS
1/6	7:30	pile dr	1:04	2:30		1.0	0	54	high	4 SE	N	N	N	N	N	N/A	N/A	N/A		PJ
1/9	8am	pile dr	7:56	8:10		5.0	100	58	high	13 NW	N	N	N	N	N	N/A	N/A	N/A		PJ
1/11	8am	pile dr	1:14pm	2:57pm		3.7	80	60	high	3 NE	N	N	N	N	N	N/A	N/A	N/A		PJ
1/16	8:30	pile dr	10:45	11:13		0.8	85	55	high	19 E	N	N	N	N	N	N/A	N/A	N/A		PJ
1/25	7:30	pile dr	10:10	11:30		4.8	0	56	high	5 SW	N	N	N	N	N	N/A	N/A	N/A		DJ

Appendix D. Hydroacoustic Monitoring Report

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Hydroacoustic Monitoring Report

USCG Construct OPC Homeport LA / LB Project

August 23, 2022 - Project 22-079

Hydroacoustic measurements were made during the impact driving of four 24-inch octagonal concrete piles at the United States Coast Guard Homeport LA/LB base in Long Beach, California on August 23, 2022. The project location is shown in Figure 1. The hammer used was a DelMag D-80 diesel impact hammer. Two-foot-thick plywood cushion blocks were used during pile driving.

Figure 1: Project Vicinity

Acoustic Terms

Various acoustical terms are used in this report. Sound pressure is the instantaneous absolute positive or negative pressure and is presented in this report as a decibel referenced as 1 micro Pascal (dB re 1 µPa). While several noise metrics are used to describe sounds in the environment, the root-mean-square (RMS) sound pressure level is an appropriate descriptor to describe measured sounds from continuous and impulsive sounds but with different averaging time constants. The RMS sound

pressure level is presented in dB re 1 µPa and is averaged over a defined time period in a stated frequency range or band. The appropriate time period to average for the RMS computation varies by the type of sound (e.g., pulsed or continuous). The average sound level during the measurement period is also computed to be the equivalent average sound pressure level measured each second over the duration of the sound (L_{eq}). Sound Exposure Level (SEL) is proportionally equivalent to the time integral of the pressure squared and is also described in this report in terms of dB re 1 μPa^2 sec over the duration of a sound event. The Peak sound pressure is the largest absolute value of the instantaneous sound pressure. Sounds for this pile installation are measured over the frequency range of 20 to 20,000 hertz (Hz). These acoustic metrics have the following definitions as applied to this purpose:

Peak: The maximum or absolute highest value of the measured sound pressure expressed in dB re 1 µPa. Impact pile driving events are characterized by the maximum and median Peak pressure per strike (of all strikes).

SEL - Sound Energy Level: the total sound energy during a measured event expressed in dB re 1 μPa^2 sec. The events used to describe the project sounds are individual pile strikes and also pile installation activities that are made up of all pile strikes (cSEL). Pile installation events are characterized by the median SEL per strike (of all strikes) and the cSEL for the entire pile driving event.

RMS – Root-Mean-Square: The method used to describe the energy of a sampled waveform in terms of sound pressure expressed in dB referenced to 1 µPa. This is defined mathematically as the square root of the mean value of the squared values of the sampled sound pressures taken over an interval. The RMS is measured for individual pile pulses (or impacts) over the period of time during the measurement that energy in the sampled waveform for an impact is between 5 percent and 95 percent of the total sampled energy. For continuous sounds, the period used to measure RMS is one second. Pile installation events are characterized by the median RMS per strike (of all strikes).

Measurement Equipment and Locations

The measurement equipment and specifications used for this project are shown in Table 1. Larson Davis Model 831C sound level meters (SLMs) were used to monitor the hydroacoustic sound levels in real time. The SLMs connected to RESON TC 4033 hydrophones were used for mid-depth measurements and Loggerhead acoustic recorders were deployed near the bottom. Three measurements positions were established at 10m, 23 to 30m and 55 to 87m from the pile. Loggerheads are bottom-mounted recording devices, where sound levels are subsequently analyzed. Note that the monitoring plan indicated measurements at 10, 20 to 30 and 200 to 300 meters. However, a position at 200 to 300 meters could not be established because of vessel activity along the existing dock beyond 200 meters and busy vessel traffic in the channel. Subsequently, measurements indicated that impact zones were likely within 100 meters so the far position was moved to near 60 meters.

Table 1: Equipment Used for Underwater Sound Monitoring

Item	Specifications	Quantity	Usage
RESON TC 4033Hydrophone	Receiving Sensitivity - -203 dB ± 2 dB re 1 V/µPa at 250 Hz	3	Measures and records underwater sounds at mid-depth position. SLM both measures (in dB) and digitally records sounds for subsequent analysis .
Larson Davis 831C Sound Level Meter	Sampling Rate - 51.6 kHz	3	
Loggerhead SNAP HTI96-min Hydrophone/Audio Recorder	Sampling rate- 48KHz Hydrophone Receiving Sensitivity - -180 and -209 dB	3	Records pile driving sound levels at hydrophone position near bottom
GRAS 42AA & 42 AC Pistonphone Calibrator	Accuracy - IEC 942 (1988) Class 1	1	Calibration check of hydrophone in the field.

Measurement Results

Ambient measurements were made from 14:45 to 16:10 on June 29, 2022 at 110 meters from the construction site along the existing dock. Observed levels on August 23, 2022 were consistent with those levels.

Table 2 presents the results of the pile driving measurements. There were many dead blows in addition to the pile driving and some of the quieter strikes may not have triggered acoustical algorithms used to detect pile strikes.

Four piles were driven with events lasting about 10 minutes over a 30 to 60-minute period as pile driving was paused do to the presence of marine mammals (i.e., Sea lions). Approximately 250 to 460 strikes per pile were recorded. For the day, there were about 1,480 pile strikes.

Ambient sounds in the area included snapping shrimp that make very short, high amplitude sounds using their claw. Sounds from snapping shrimp are produced by the popping of a bubble that is produced when the larger claw opens and closes rapidly. There are numerous shrimp in the area around the pile driving activity producing snapping sounds that are almost constant with peak sound pressures of 140 to 170 dB. Pile driving sounds, which have greater acoustic energy, make peak sound pressures around 177 dB at 87 meters from the pile. The acoustic algorithms used to detect pile driving pulses are masked by these ambient sounds such that the RMS sound pressure level for each pile driving pulse cannot be accurately measured.

Distance to Thresholds

The 206 dB threshold was not exceeded anywhere as maximum peak levels at 10 meters were 197 dB or lower. For accumulated sounds, there were about 1,480 strikes measured with a 10-meter SELss level of 169.5 dB. The distance to the 187 dB threshold for fish was computed at 50 meters.

For marine mammals, Level A effects occur for Phocid pinnipeds at an accumulated SEL (weighted for frequency) of 185 dB and at 203 dB for Otariid pinnipeds. Based on all measurement points, the transmission loss for cSEL was computed to be 21* Log10 (distance). The distance to thresholds for cSEL and RMS levels were computed in Table 2.

Table 2: Daily Data Summary Sheet for Impact Pile Driving Activity August 23, 2022

Time	Pile ID	Hammer Type	No. of Strikes	Distance to Pile from Hydrophone (m)	Depth (m)		Peak (dB)			SEL (dB)			RMS (dB)	
					Water	Sensor	Max		Median	Max	Median	cSEL	Max	Median/ duration
08:32 to 08:52	Pile #46A	Impact Hammer D-80	251	10	9	5	190		188	167	165	189.1	178	175/0.09s
						8	194		193	169	168	191.7	183	181/0.1s
				30	9	5	184		180	161	159	182.9	168	166/0.22s
						8	186		182	160	158	181.6	170	168/0.24s
				87	9	5	--[1]		--[1]	--[1]	--[1]	--[1]	--[1]	--[1]
						8	177		172	152	150	173.0	166	154/0.42s
11:17 to 12:18	Pile #46B	Impact Hammer D-80	462	10	10	5	196		191	171	169	195.1	185	180/0.06s
						8	197		195	171	170	196.2	186	182/0.1s
				23	10	5	188		185	163	162	188.4	177	171/0.13s
						8	191		188	165	162	189.1	181	174/0.15s
				55	13	6	182		178	159	154	181.8	170	160/0.25s
						11	182		177	157	155	181.1	163	160/0.29s
14:13 to 14:42	Pile #48D	Impact Hammer D-80	439	10	10	5	195		191	171	169	195.6	184	181/0.06s
						9	197		195	171	170	195.9	185	183/0.10s
				30	10	5	187		183	165	160	186.9	186	168/0.16s
						9	191		188	164	161	187.9	182	173/0.16s
				62	13	6	180		176	156	154	180.4	165	159/0.26s
						11	181		177	159	154	182.2	168	159/0.30s

Table 2: Daily Data Summary Sheet for Impact Pile Driving Activity August 23, 2022														
Time	**Pile ID**	**Hammer Type**	**No. of Strikes**	**Distance to Pile from Hydrophone (m)**	**Depth (m)**		**Peak (dB)**			**SEL (dB)**			**RMS (dB)**	
					Water	**Sensor**	**Max**		**Median**	**Max**	**Median**	**cSEL**	**Max**	**Median/ duration**
16:04 to 16:30	48C		327	10	10	5	195		193	172	170	194.7	185	182/0.05s
						9	196		194	171	169	194.2	186	183/0.04s
				28	10	5	186		182	163	160	184.8	173	166/0.24s
						9	189		187	164	162	187.0	180	174/0.14s
				60	13	6	177		174	154	151	175.5	166	157/0.26s
						11	181		177	158	155	180.0	172	166/0.10s
Ambient[2] 14:45 to 15:15 **June 29**	--	--	--	--	8	5	172		--	--	--			125 Cont. Leq(80min)

Notes:

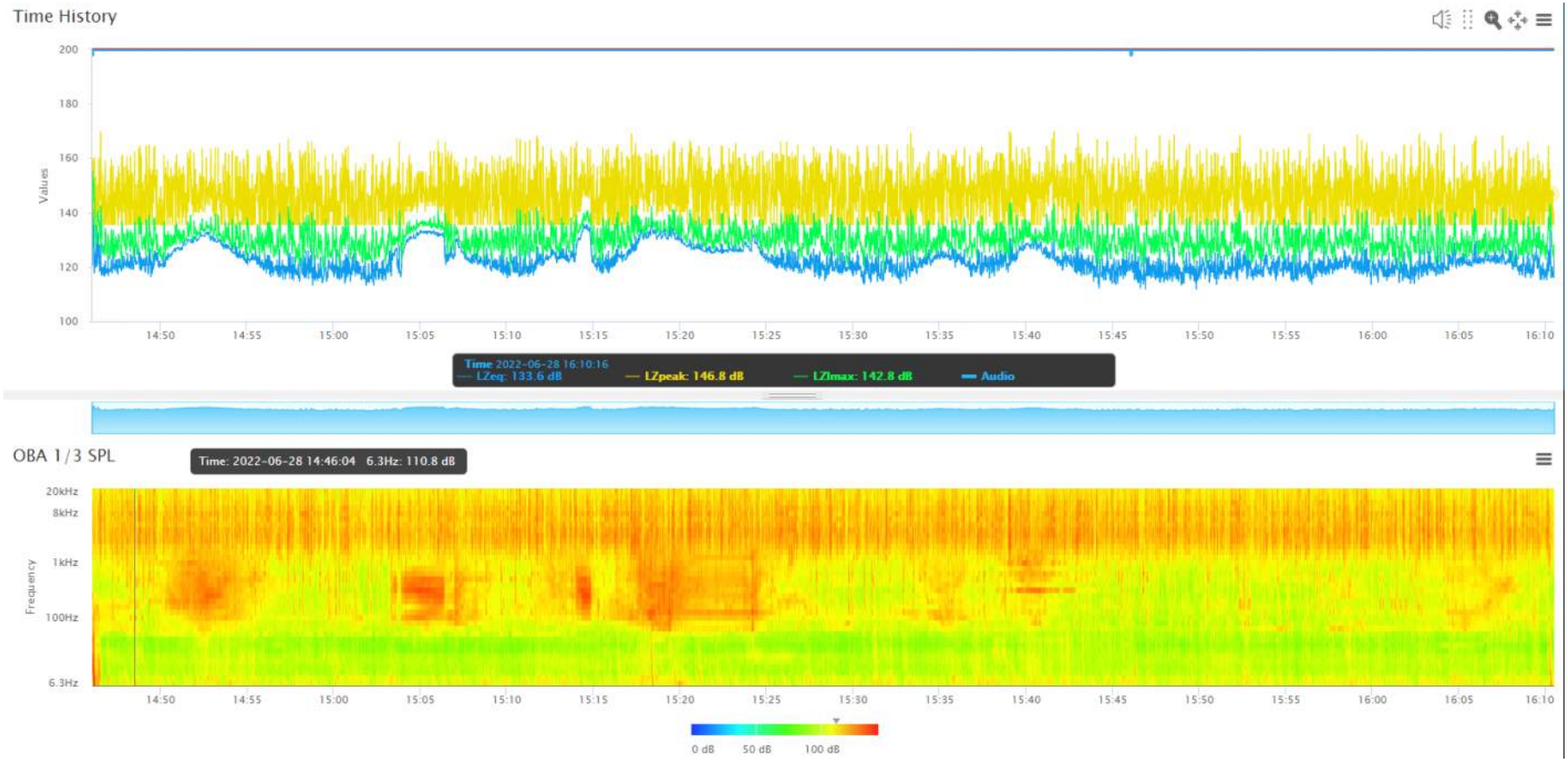
[1] *Hydrophone engulfed in kelp and measured low value; therefore, data discarded.*

[2] *Sounds dominated by vessel traffic and snapping shrimp sounds.*

Table 3: Distance to Applicable Underwater Noise Thresholds Impact Pile Driving Activity

Pile	187 dB cSEL Fish	185 dB cSEL Phocid Pinniped	203 dB cSEL Otariid Pinniped	160 dB RMS Behaivior
Test Pile #1, 46A, 46D, 48, 48	30 m Per pile	27m Per pile	4m Per pile	70m
Daily – August 23 4 piles	50m	47m	7m	

Ambient Measurement at 110 meters from construction on June 29, 2022. Note various vessel passages, with large vessels passing at 14:50-55 and 15:03-08, 15:15, and 15:17-25. A large container ship passed 137m at 14:05 and another at 155m at 15:15. Each were escorted by tug boats.

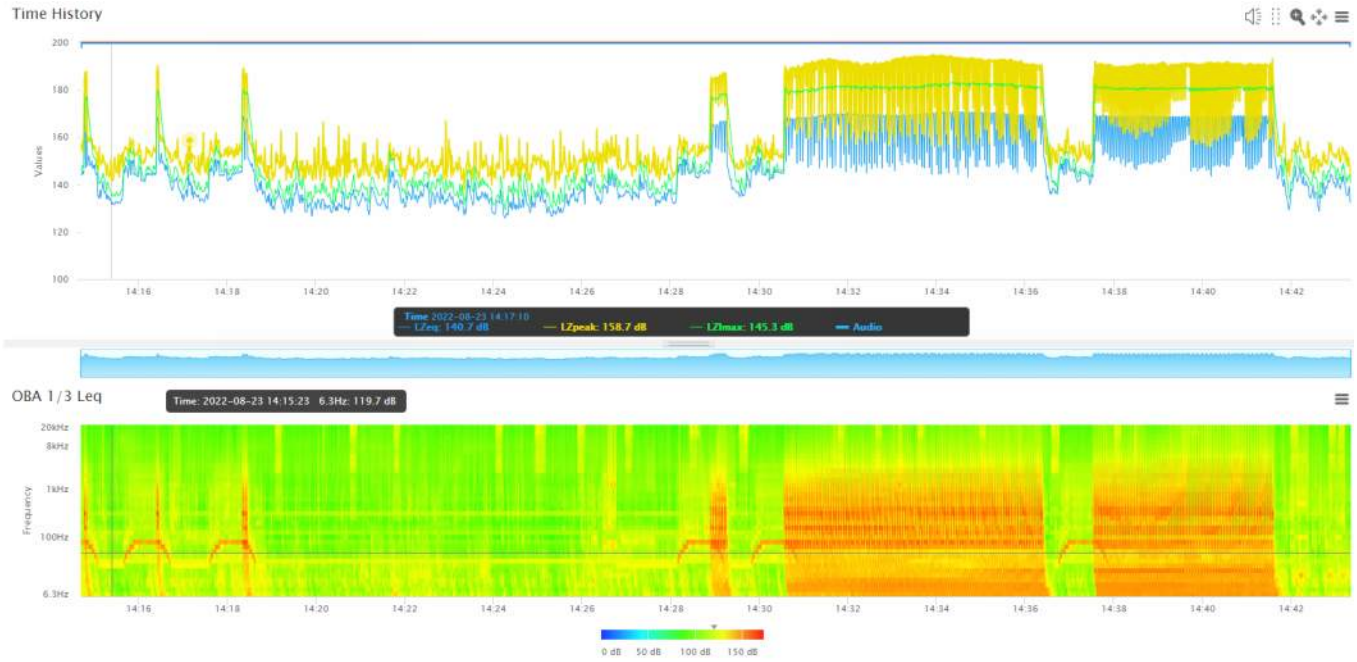


Measurements at 10 meters from Pile (mid depth)

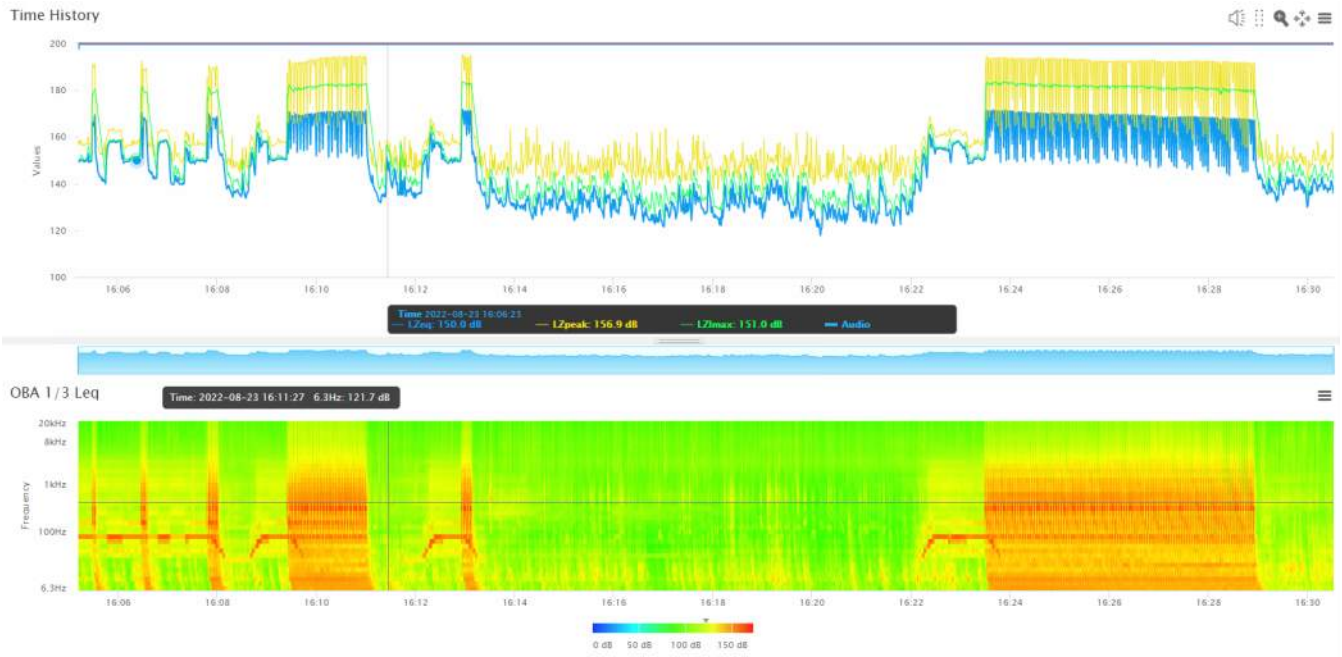
Pile 46A – 10m

Pile 46D – 10m

Pile 48D – 10m

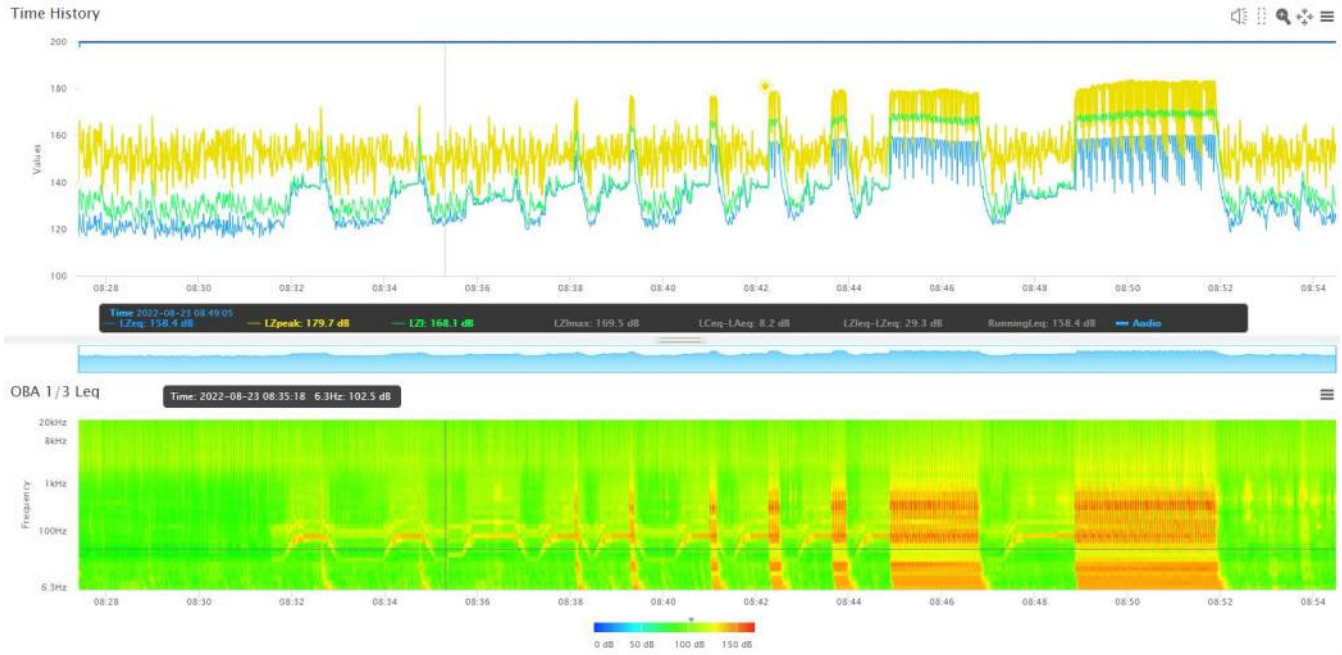


Pile 48C – 10m

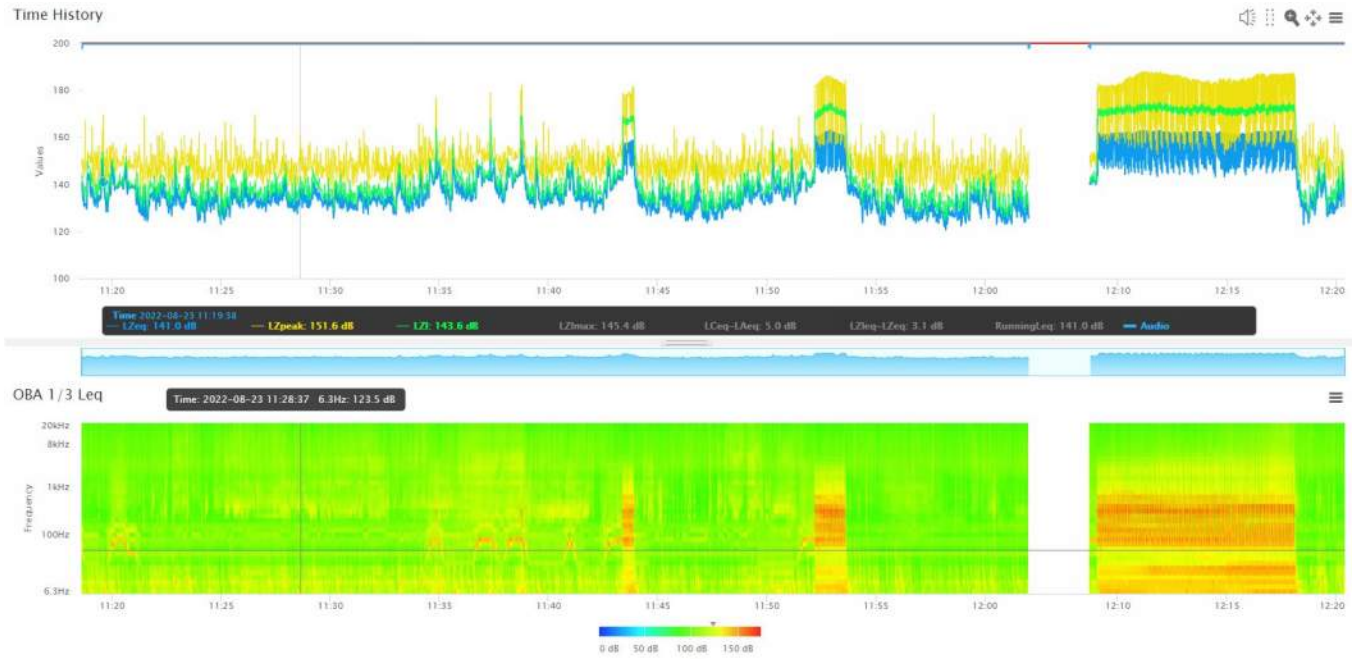


Measurements at 23 to 30 meters from Pile (mid depth)

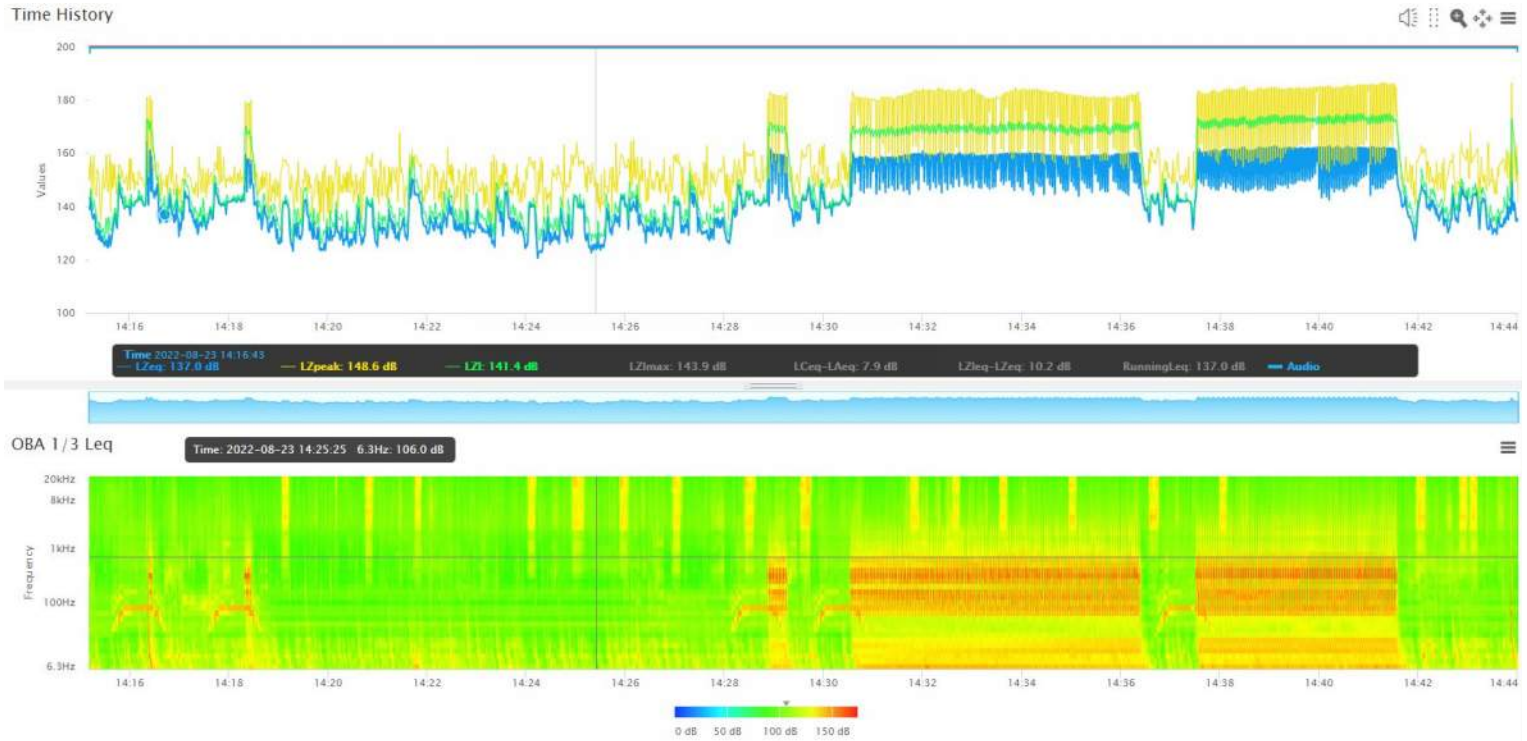
Pile 46A – 30m



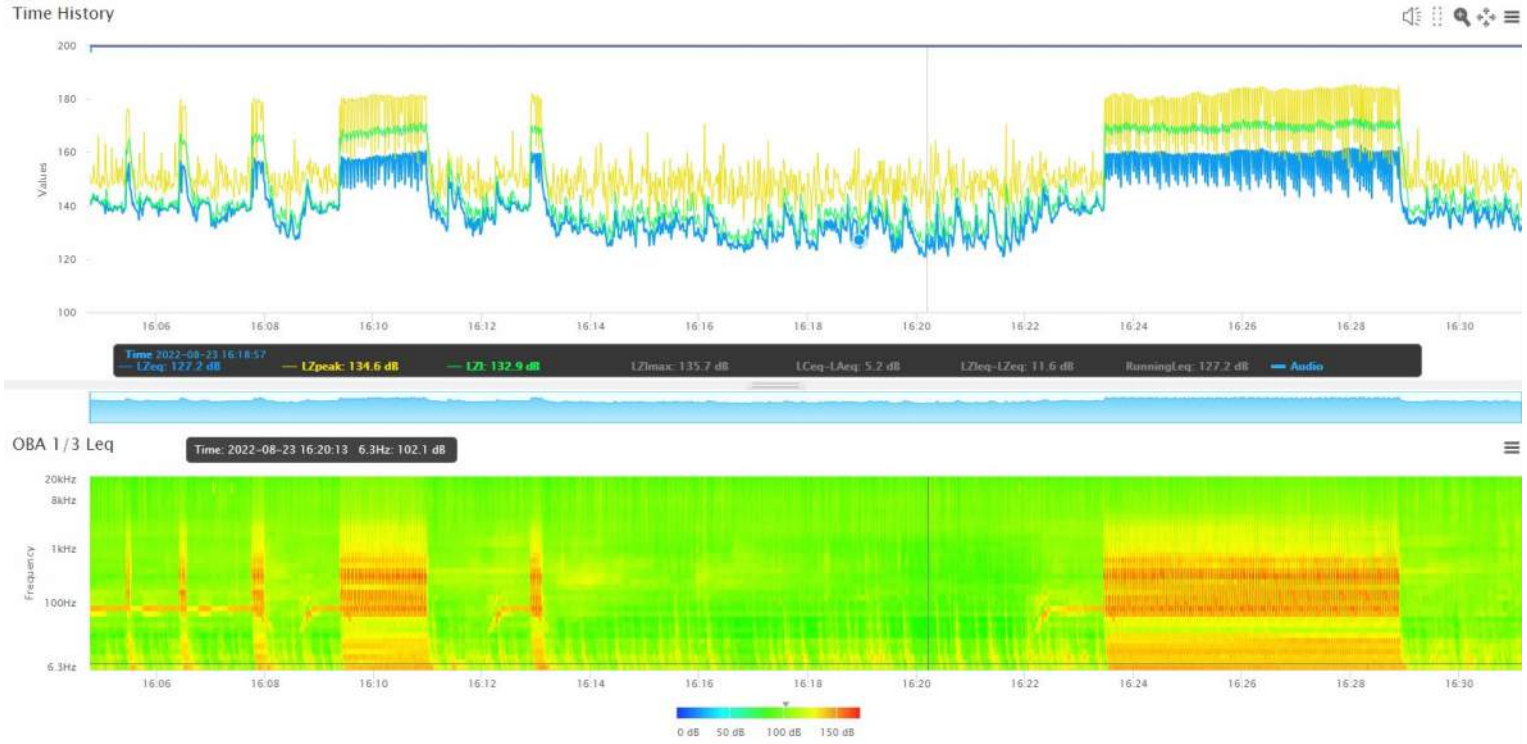
Pile 46D – 23m



Pile 48D – 30m

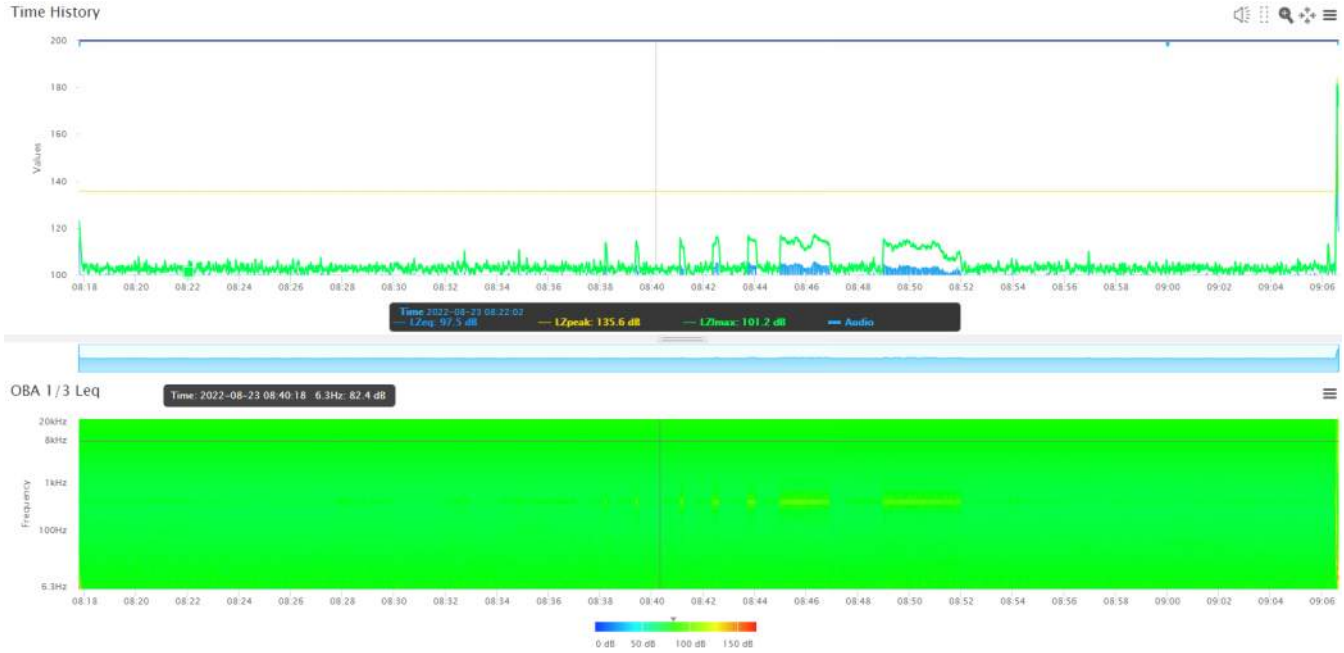


Pile 48C – 28m

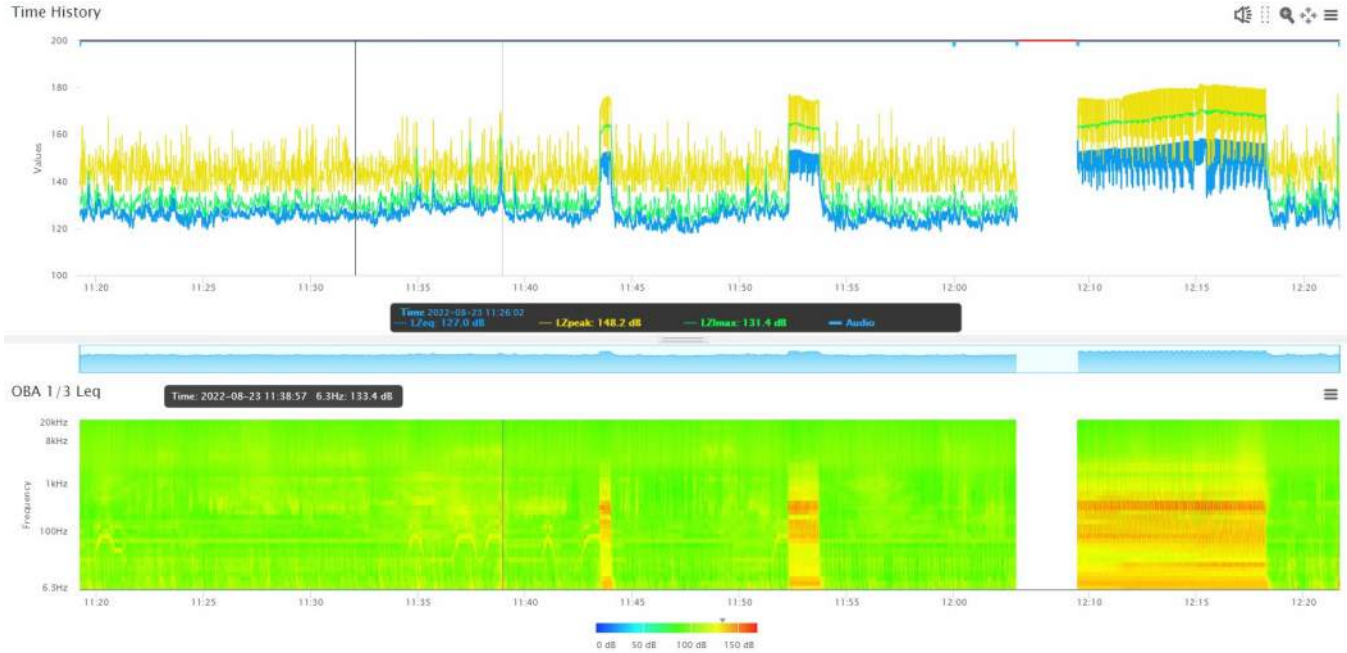


Measurements at 87, 55, 62 and 60 meters from Pile (mid depth)

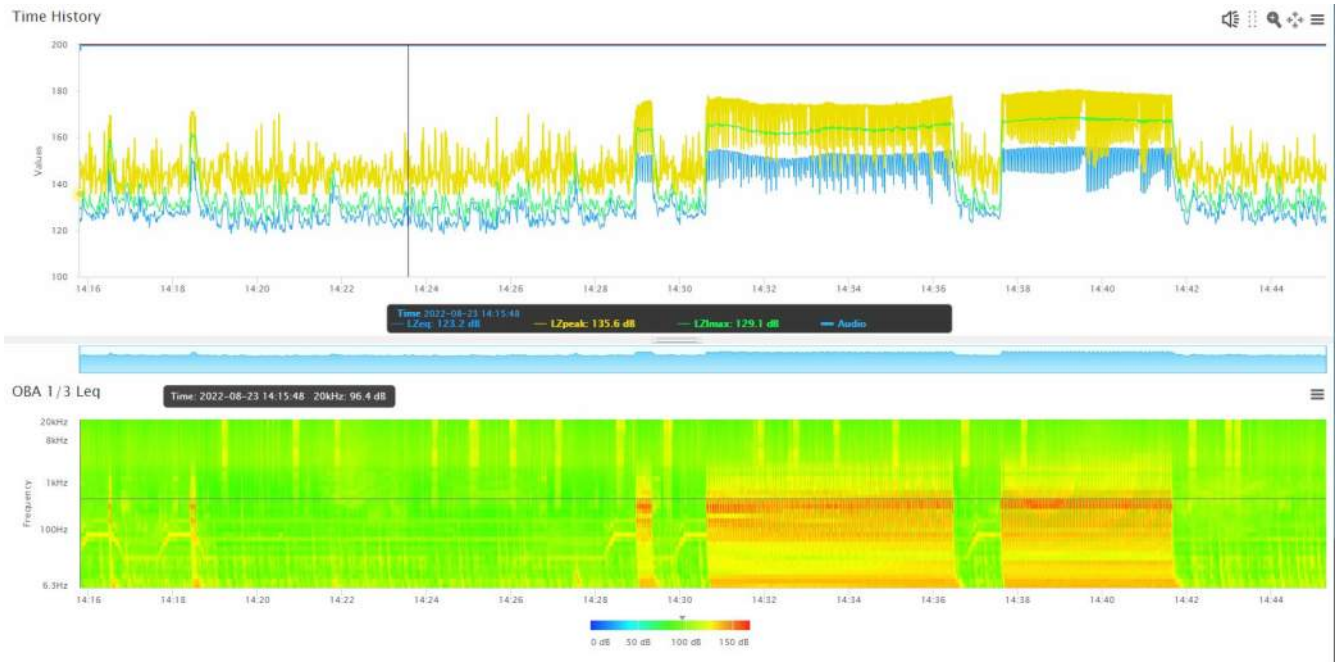
Pile 46A – 87m



Pile 46D – 55m



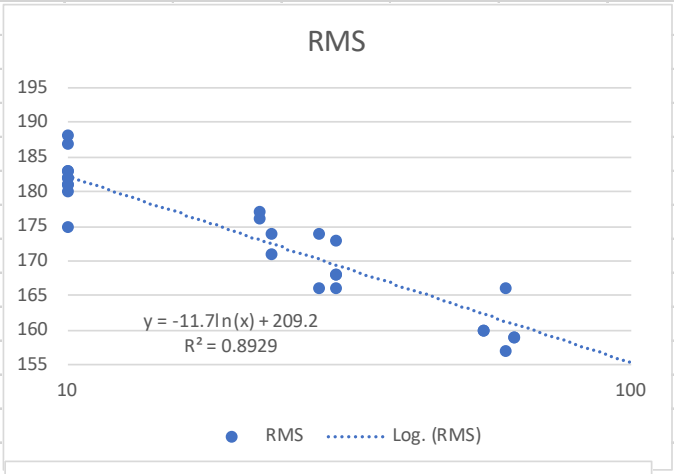
Pile 48D – 62m

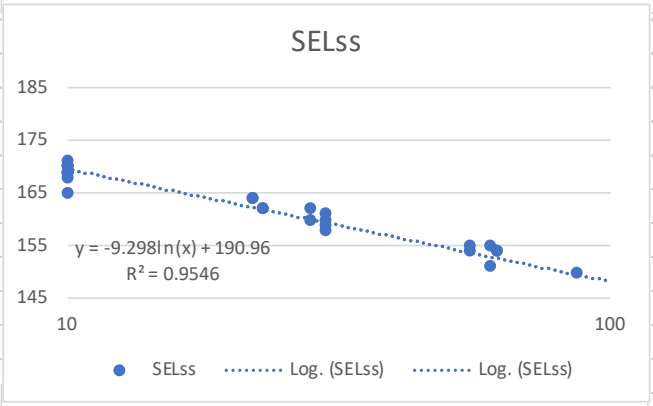


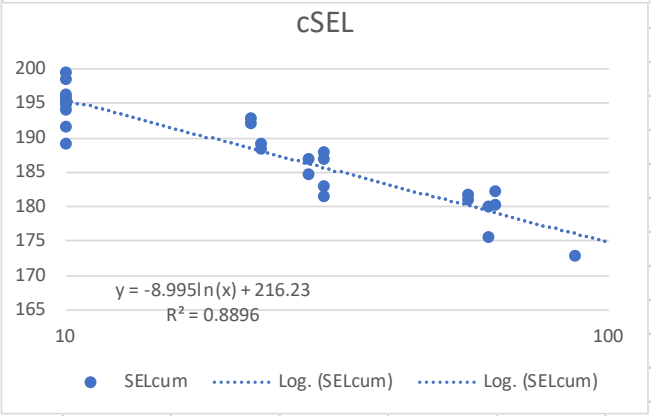
Pile 48C – 60m

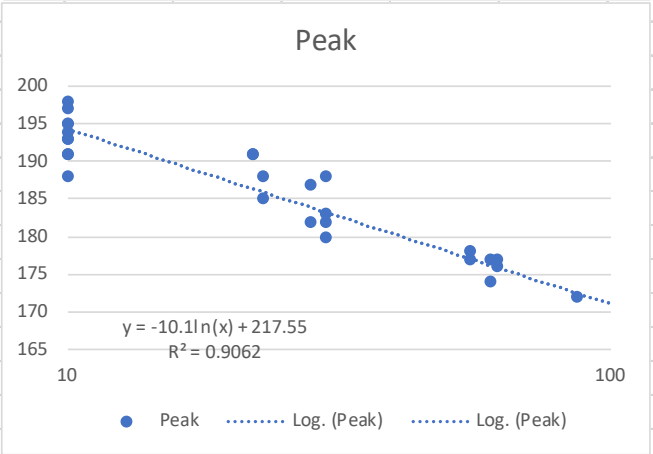
Threshold Distance Calculations

29-Jun				
Test Pile #1				
23-Aug-22				
Piles 46A, 46D, 48D, 48C				
Distance	**Peak**	**RMS**	**SELstrike**	**SELcum**
10	197	188	169	198.4
10	198	187	171	199.5
22	191	176	164	192.9
22	191	177	164	192
110	168	156	144	173.7
110	168	160	144	172.9
10	188	175	165	189.1
10	193	181	168	191.7
30	180	166	159	182.9
30	182	168	158	181.6
87	172	154	150	173
10	191	180	169	195.1
10	195	182	170	196.2
23	185	171	162	188.4
23	188	174	162	189.1
55	178	160	154	181.8
55	177	160	155	181.1
10	191	181	169	195.6
10	195	183	170	195.9
30	183	168	160	186.9
30	188	173	161	187.9
62	176	159	154	180.4
62	177	159	154	182.2
10	193	182	170	194.7
10	194	183	169	194.2
28	182	166	160	184.8
28	187	174	162	187
60	174	157	151	175.6
60	177	166	155	180
Ln	10.1	11.7	9.298	8.995
Log10	**23.3**	**26.9**	**21.4**	**20.7**
SL	217.55	209.2	190.96	216.23
10m	194.3	182.3	169.5	195.5
Distance to 187 dB SELcum			50	
Distance to 160 dB RMS			70	









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Hydroacoustic Monitoring Report

USCG Construct OPC Homeport LA / LB Project

January 18, 2023 - Project 22-079

Hydroacoustic measurements were made during the impact driving of two 24-inch square concrete fender piles at the United States Coast Guard Homeport LA/LB base in Long Beach, California on January 18, 2023. The project location is shown in Figure 1. The hammer used was a DelMag D-80 diesel impact hammer. Two-foot-thick plywood cushion blocks were used during pile driving. Impact driving occurred for two piles.

Figure 1: Project Vicinity

Acoustic Terms

Various acoustical terms are used in this report. Sound pressure is the instantaneous absolute positive or negative pressure and is presented in this report as a decibel referenced as 1 micro Pascal (dB re 1 µPa). While several noise metrics are used to describe sounds in the environment, the root-mean-square (RMS) sound pressure level is an appropriate descriptor to describe measured sounds from

continuous and impulsive sounds but with different averaging time constants. The RMS sound pressure level is presented in dB re 1 µPa and is averaged over a defined time period in a stated frequency range or band. The appropriate time period to average for the RMS computation varies by the type of sound (e.g., pulsed or continuous). The average sound level during the measurement period is also computed to be the equivalent average sound pressure level measured each second over the duration of the sound (L_{eq}). Sound Exposure Level (SEL) is proportionally equivalent to the time integral of the pressure squared and is also described in this report in terms of dB re 1 μPa^2 sec over the duration of a sound event. The Peak sound pressure is the largest absolute value of the instantaneous sound pressure. Sounds for this pile installation are measured over the frequency range of 20 to 20,000 hertz (Hz).

These acoustic metrics have the following definitions as applied to this purpose:

> **Peak**: The maximum or absolute highest value of the measured sound pressure expressed in dB re 1 µPa. Impact pile driving events are characterized by the maximum and median Peak pressure per strike (of all strikes).
>
> **SEL -** Sound Energy Level: the total sound energy during a measured event expressed in dB re 1 μPa^2 sec. The events used to describe the project sounds are individual pile strikes and also pile installation activities that are made up of all pile strikes (cSEL). Pile installation events are characterized by the median SEL per strike (of all strikes) and the cSEL for the entire pile driving event.
>
> **RMS** – Root-Mean-Square: The method used to describe the energy of a sampled waveform in terms of sound pressure expressed in dB referenced to 1 µPa. This is defined mathematically as the square root of the mean value of the squared values of the sampled sound pressures taken over an interval. The RMS is measured for individual pile pulses (or impacts) over the period of time during the measurement that energy in the sampled waveform for an impact is between 5 percent and 95 percent of the total sampled energy. For continuous sounds, the period used to measure RMS is one second. Pile installation events are characterized by the median RMS per strike (of all strikes).

Measurement Equipment and Locations

The measurement equipment and specifications used for this project are shown in Table 1. Larson Davis Model 831C sound level meters (SLMs) were used to monitor the hydroacoustic sound levels in real time. The SLMs connected to RESON TC 4033 hydrophones were used for mid-depth measurements and Autonomous acoustic recorders were deployed near the bottom. Measurement positions were established at 10, 68, and 212 meters from the piles (as shown in Figure 2).

Table 1: Equipment Used for Underwater Sound Monitoring

Item	Specifications	Quantity	Usage
RESON TC 4033Hydrophone	Receiving Sensitivity - -203 dB ± 2 dB re 1 V/µPa at 250 Hz	3	Measures and records underwater sounds at mid-depth position. SLM both measures (in dB) and digitally records sounds for subsequent analysis .
Larson Davis 831C Sound Level Meter	Sampling Rate - 51.6 kHz	3	
Autonomous unit with REASON TC 4013 Hydrophone and Audio Recorder	Hydrophone Receiving Sensitivity - 203 dB + 2 dB re 1 V/µPa	3	Records pile driving sound levels at hydrophone position near bottom
GRAS 42AA & 42 AC Pistonphone Calibrator	Accuracy - IEC 942 (1988) Class 1	1	Calibration check of hydrophone in the field.

Figure 2: Measurement Positions

Measurement Results

Ambient measurements were made from 14:45 to 16:10 on June 29, 2022, at 110 meters from the construction site along the existing dock.

Table 2 presents the results of the pile driving measurements. There were many dead blows in addition to the pile driving and some of the quieter strikes may not have triggered acoustical algorithms used to detect pile strikes. Data analysis indicate about 85 pile strikes, depending on the triggering system.

Pile 1 pile driving began around 07:47, with a series of 2 dead blows consistent pile driving beginning about 07:49 and was stopped at 07:50. Pile driving for pile 2 began around 07:56, with a series of 3 dead blows consistent pile driving beginning about 07:58 and was stopped at 07:59. At this point the bottom guides were removed and both piles were driven a few additional blows to get to the final tip elevation. There were 7 blows on Pile 1 and 11 blows for pile 2. All pile driving was completed in approximately at approximately 08:28.

Note that sound measurements of pile driving were clearly audible at 212 meters from the pile. However, ambient sounds in the area included snapping shrimp that make very short, high amplitude sounds using their claw. Sounds from snapping shrimp are produced by the popping of a bubble that is produced when the larger claw opens and closes rapidly. There are numerous shrimp in the area around the pile driving activity producing snapping sounds that are almost constant with peak sound pressures of 140 to 170 dB. Pile driving sounds, which have greater acoustic energy, make peak sound pressures around 160 dB at 212 meters from the pile. The acoustic algorithms used to detect pile driving pulses are masked by these ambient sounds such that the RMS sound pressure level for each pile driving pulse cannot be accurately measured. Therefore, the impulse detector of the sound level meter was used to provide an estimate of pulsed RMS levels. This likely provides an overestimate due to the inclusion of non-pile driving sound and the shorter RMS averaging duration employed by the impulse detector.

Distance to Thresholds

As per the NMFS guidelines, impact driving SEL level per strike below 150 dB would not accumulate enough energy to cause any significant impacts to fishes in the area. This would apply to measurements made at 212 meters since the SEL levels are below 150 dB. The 206 dB threshold was not exceeded anywhere as maximum peak levels at 10 meters were 198 dB or lower.

For marine mammals, Level A effects occur for Phocid pinnipeds at an accumulated SEL (weighted for frequency) of 185 dB and at 203 dB for Otariid pinnipeds. Based on all measurement points, the transmission loss for cSEL was computed to be 23* Log10 (distance). The distance to thresholds for cSEL and RMS levels were computed and shown in Table 3 and the calculations are shown in **Attachment F**. Note these distances to the thresholds are based on results from both piles.

Table 2: Daily Data Summary Sheet for Impact Pile Driving Activity Test Pile #1, January18, 2023

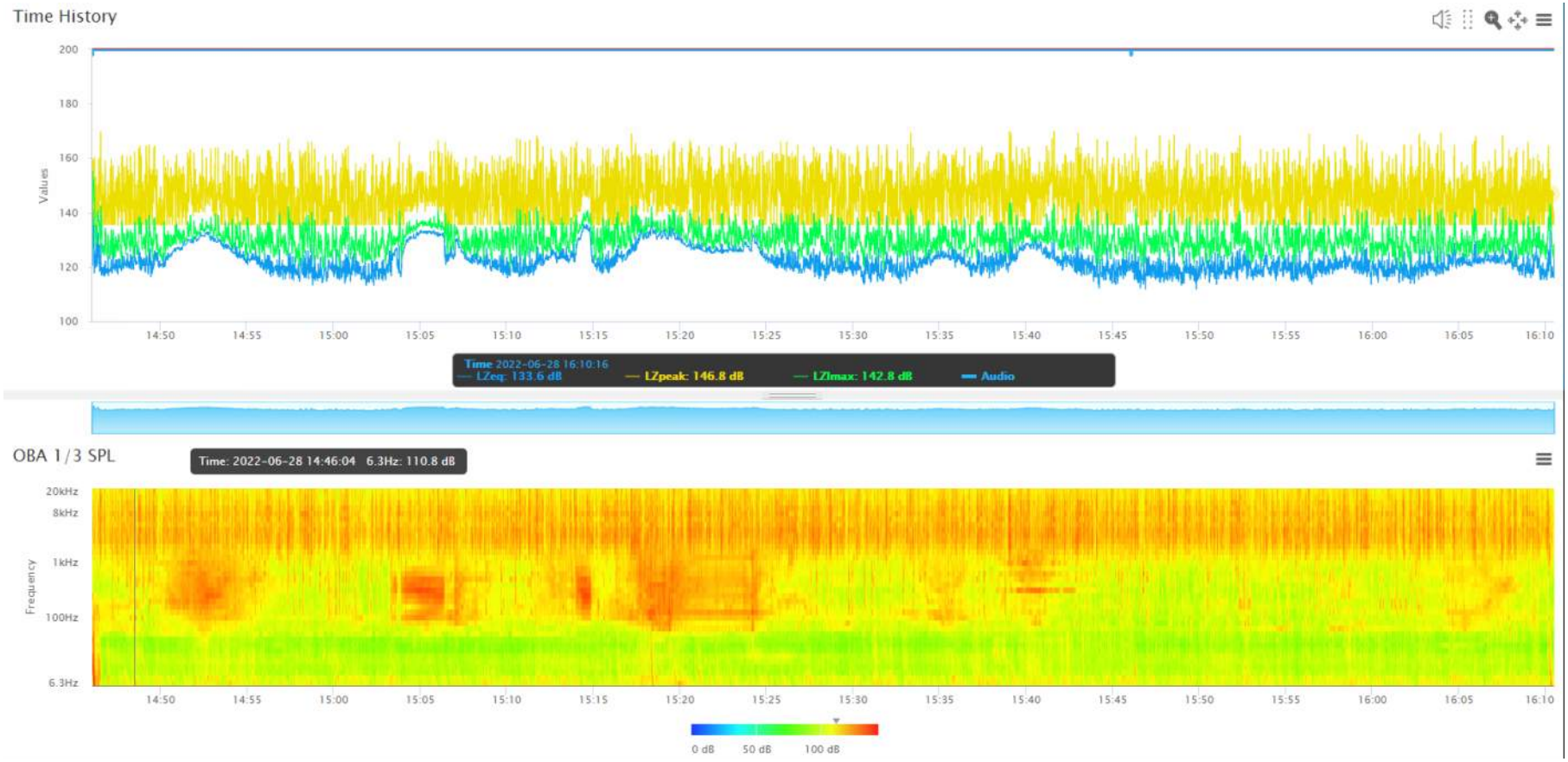
Time	Pile ID	Hammer Type	No. of Strikes	Distance to Pile from Hydrophone (m)	Depth (m)		Peak (dB)			SEL (dB)			RMS (dB)	
					Water	Sensor	Max		Median	Max	Median	cSEL	Max	Median/ Duration
Part 0ne 07:47 – 07:50 Part two 08:18 – 08:19	Fender Pile	Impact Hammer D-80	41	10	9	4	198		190	173	167	185	185	179 0.07sec
						8	194		188	172	166	184	184	177 0.15sec
				68	9	4	179		173	157	151	169	168	162 0.09sec
						8	175		156	153	143	163	164	152[a]
				212	9	4	172		159	147	140	157[b]	158	151[a]
						8	165		152	141	136	152[b]	151	144[a]
Part 0ne 07:56 – 07:59 Part two 08:25 – 08:27	Fender Pile	Impact Hammer D-80	44	10	9	4	191		190	170	167	184	181	180 0.06sec
						8	189		187	168	167	183	179	178 0.15sec
				68	9	4	174		171	153	152	168	164	162 0.09sec
						8	169		161	153	149	166	161	157[a]
				212	9	4	169		157	141	138	155[b]	151	150[a]
						8	150		147	136	133	150[b]	145	141[a]
Ambient [c] 14:45 to 15:15 June 29	--	--	--	--	8	5	172		--	--	--	--		125 Cont. Leq(80min)

[a] No Audio data to calculate pulse duration
[b] Single strike sounds less than 150 dB do not accumulate to cause injury to fish, marine mammal cSEL only.
[c] Dominated by sounds from snapping shrimp and vessel passages.

Table 3: Distance to Applicable Underwater Noise Thresholds Impact Pile Driving Activity

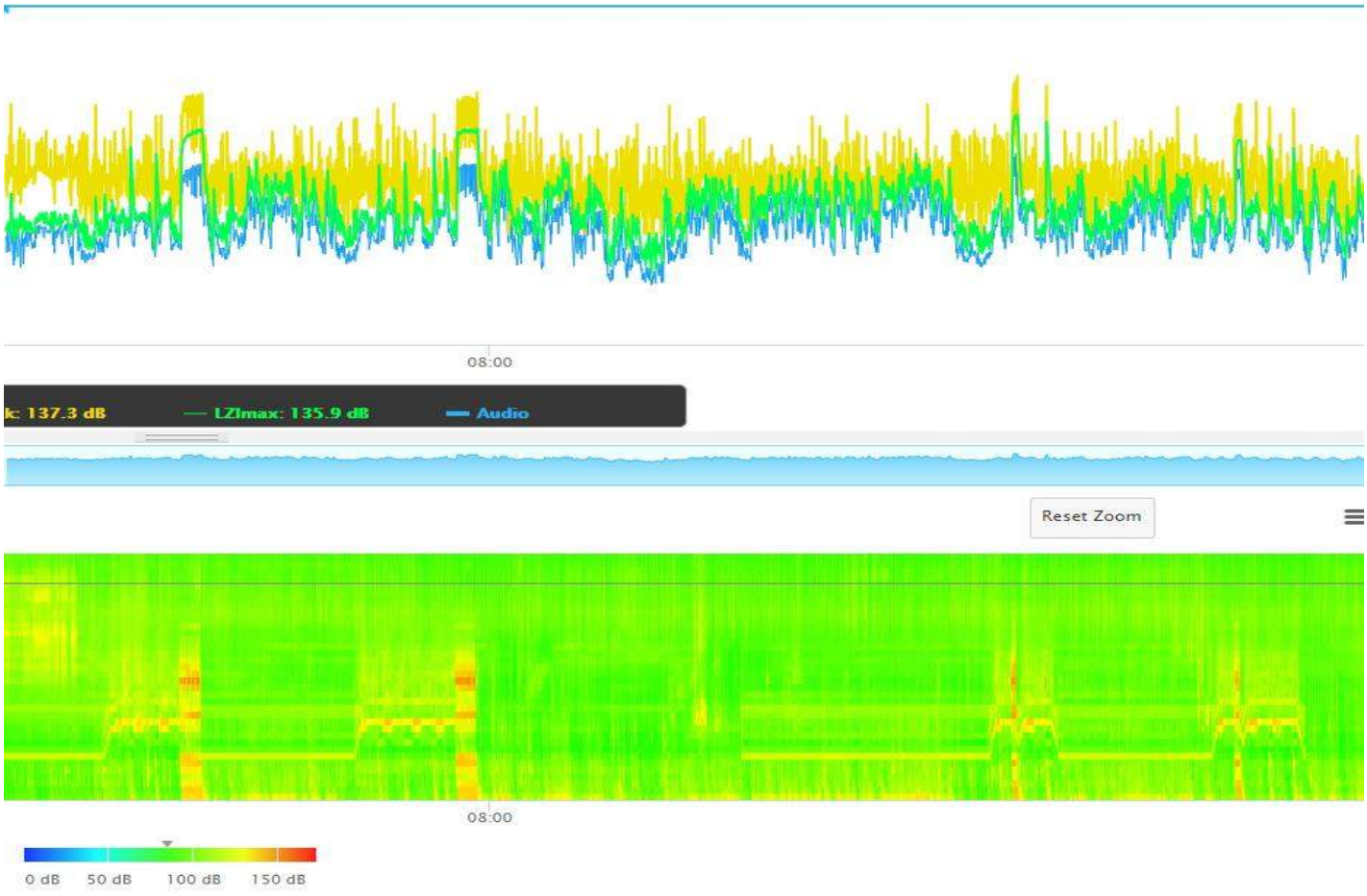
Pile	187 dB cSEL Fish	185 dB cSEL Phocid Pinniped	203 dB cSEL Otariid Pinniped	160 dB RMS Behavior
Fender piles	9	9	2	67

Attachment A - Ambient Measurement at 110 meters from construction on June 29, 2022. Note various vessel passages, with large vessels passing at 14:50-55 and 15:03-08, 15:15, and 15:17-25. A large container ship passed 137m at 14:05 and another at 155m at 15:15. Each were escorted by tug boats.

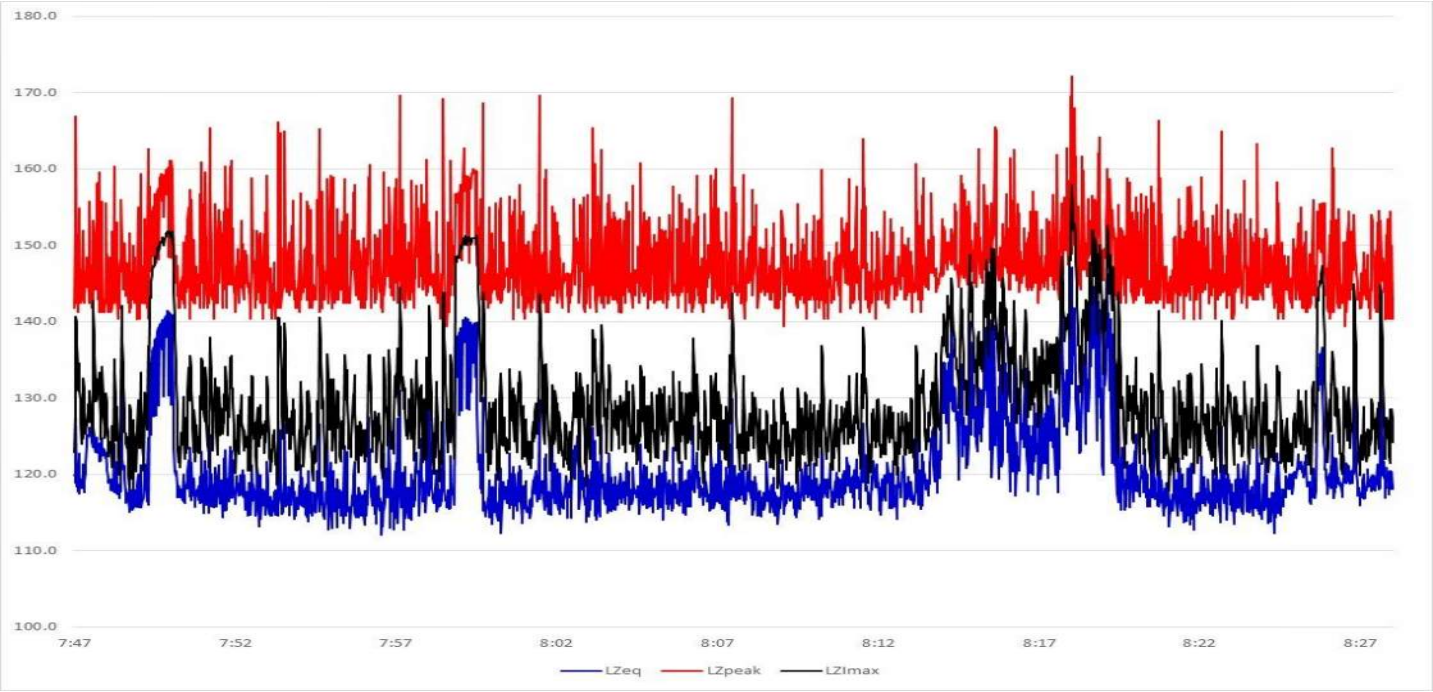


Attachment B - Measurements at 10 meters from Pile (mid depth)

Attachment C - Measurements at 68 meters from Pile (mid depth and near bottom)



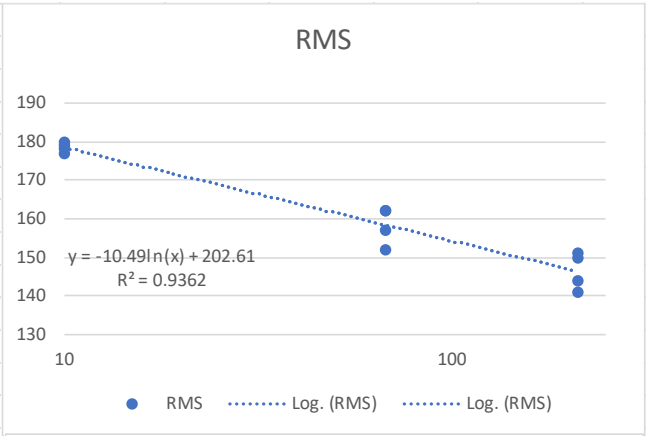
Attachment D - Measurements at 212 meters from Pile (mid depth)

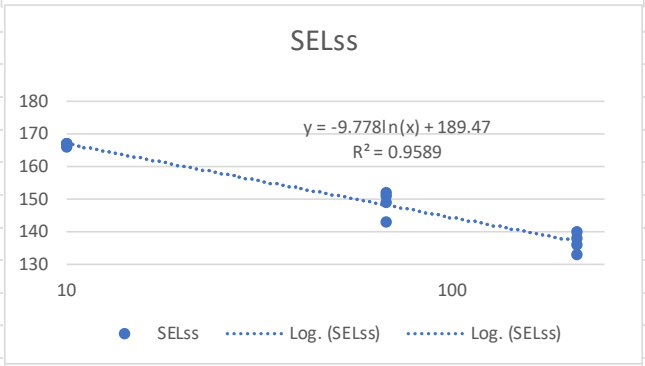


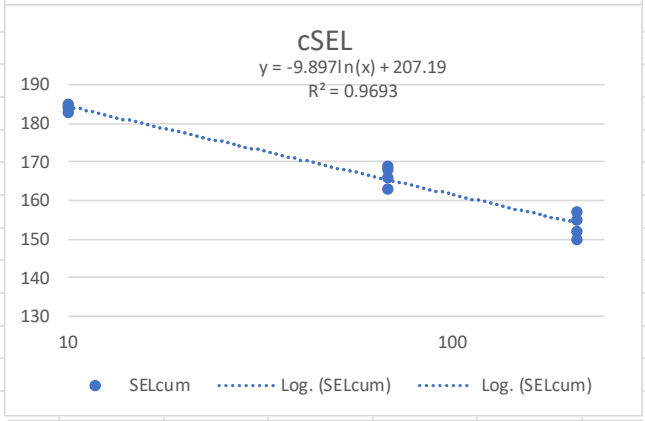
Attachment E - Threshold Distance Calculations

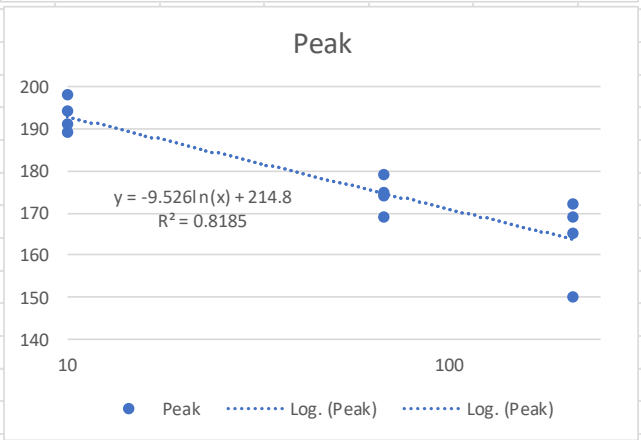
Composite piles
25-Jan-23
Piles A-I

Distance	Peak	RMS	SELstrike	SELcum
10	198	179	167	185
10	194	177	166	184
10	191	180	167	184
10	189	178	167	183
68	179	162	151	169
68	175	152	143	163
68	174	162	152	168
68	169	157	149	166
212	172	151	140	157
212	165	144	136	152
212	169	150	138	155
212	150	141	133	150
Ln	9.526	10.49	9.77	9.897
Log10	**21.9**	**24.2**	**22.5**	**22.8**
SL	217.02	202.61	185.46	202.98
10m	195.1	178.5	163.0	180.2
Distance to 187 dB SELcum			9	
Distance to 160 dB RMS			67	









Attachment F - Data from NMFS Multi-Species Spread Sheet (August 2022b)

IMPACT PILE DRIVING REPORT
VERSION 1.2-Multi-Species: 2022
USCG Construct OPC Homeport LA/LB Project

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN
(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	198	167	179
Distance associated with single strike level (meters)	10	10	10
Transmission loss constant	23		
Number of piles per day	2		
Number of strikes per pile	43		
Number of strikes per day	86		
Cumulative SEL at measured distance	186		

OTHER INFO: two 24-inch concrete fender piles January 18, 2023

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth
		Fish ≥ 2 g	Fish < 2 g	
ISOPLETHS (meters)	4.5	9.4	14.0	182.3
Isopleth (feet)	14.7	30.7	45.9	598.2

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.3	1.7	14.9
Isopleth (feet)	1.1	5.6	49.0

Sea Turtles present

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	1.2	0.4	6.7	1.4	0.3
PTS ONSET (Peak isopleth, feet)	4.0	1.3	22.0	4.4	1.1
PTS ONSET (SEL_{cum} isopleth, meters)	14.0	1.6	15.7	9.3	1.7
PTS ONSET (SEL_{cum} isopleth, feet)	45.8	5.2	51.4	30.5	5.5
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	67.0	LF Cet. present			
Behavior (RMS isopleth, feet)	219.8				

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Hydroacoustic Monitoring Report

USCG Construct OPC Homeport LA / LB Project

January 25, 2023 - Project 22-079

Hydroacoustic measurements were made during the impact driving of nine 16-inch composite fender piles at the United States Coast Guard Homeport LA/LB base in Long Beach, California on January 25, 2023. The project location is shown in Figure 1. The hammer used was a DelMag 19-52 diesel impact hammer.

Figure 1: Project Vicinity

Acoustic Terms

Various acoustical terms are used in this report. Sound pressure is the instantaneous absolute positive or negative pressure and is presented in this report as a decibel referenced as 1 micro Pascal (dB re 1 µPa). While several noise metrics are used to describe sounds in the environment, the root-mean-square (RMS) sound pressure level is an appropriate descriptor to describe measured sounds from continuous and impulsive sounds but with different averaging time constants. The RMS sound

pressure level is presented in dB re 1 µPa and is averaged over a defined time period in a stated frequency range or band. The appropriate time period to average for the RMS computation varies by the type of sound (e.g., pulsed or continuous). The average sound level during the measurement period is also computed to be the equivalent average sound pressure level measured each second over the duration of the sound (L_{eq}). Sound Exposure Level (SEL) is proportionally equivalent to the time integral of the pressure squared and is also described in this report in terms of dB re 1 μPa^2 sec over the duration of a sound event. The Peak sound pressure is the largest absolute value of the instantaneous sound pressure. Sounds for this pile installation are measured over the frequency range of 20 to 20,000 hertz (Hz).

These acoustic metrics have the following definitions as applied to this purpose:

> **Peak**: The maximum or absolute highest value of the measured sound pressure expressed in dB re 1 µPa. Impact pile driving events are characterized by the maximum and median Peak pressure per strike (of all strikes).
>
> **SEL** - Sound Energy Level: the total sound energy during a measured event expressed in dB re 1 μPa^2 sec. The events used to describe the project sounds are individual pile strikes and also pile installation activities that are made up of all pile strikes (cSEL). Pile installation events are characterized by the median SEL per strike (of all strikes) and the cSEL for the entire pile driving event.
>
> **RMS** – Root-Mean-Square: The method used to describe the energy of a sampled waveform in terms of sound pressure expressed in dB referenced to 1 µPa. This is defined mathematically as the square root of the mean value of the squared values of the sampled sound pressures taken over an interval. The RMS is measured for individual pile pulses (or impacts) over the period of time during the measurement that energy in the sampled waveform for an impact is between 5 percent and 95 percent of the total sampled energy. For continuous sounds, the period used to measure RMS is one second. Pile installation events are characterized by the median RMS per strike (of all strikes).

Measurement Equipment and Locations

The measurement equipment and specifications used for this project are shown in Table 1. Larson Davis Model 831C sound level meters (SLMs) were used to monitor the hydroacoustic sound levels in real time. The SLMs connected to RESON TC 4033 hydrophones were used for mid-depth measurements and Loggerhead acoustic recorders were deployed near the bottom. Measurement positions were established at 10, 68, and 212 meters from the piles (as shown in Figure 2).

Table 1: Equipment Used for Underwater Sound Monitoring

Item	Specifications	Quantity	Usage
RESON TC 4033Hydrophone	Receiving Sensitivity - -203 dB ± 2 dB re 1 V/µPa at 250 Hz	3	Measures and records underwater sounds at mid-depth position. SLM both measures (in dB) and digitally records sounds for subsequent analysis.
Larson Davis 831C Sound Level Meter	Sampling Rate - 51.6 kHz	2	
Larson Davis 831C Sound Level Meter	Sampling Rate - 51.6 kHz	1	
Autonomous Hydrophone/Audio Recorder	Sampling rate- 48KHz Hydrophone Receiving Sensitivity - -180 and -209 dB	3	Records pile driving sound levels at hydrophone position near bottom
GRAS 42AA & 42 AC Pistonphone Calibrator	Accuracy - IEC 942 (1988) Class 1	1	Calibration check of hydrophone in the field.

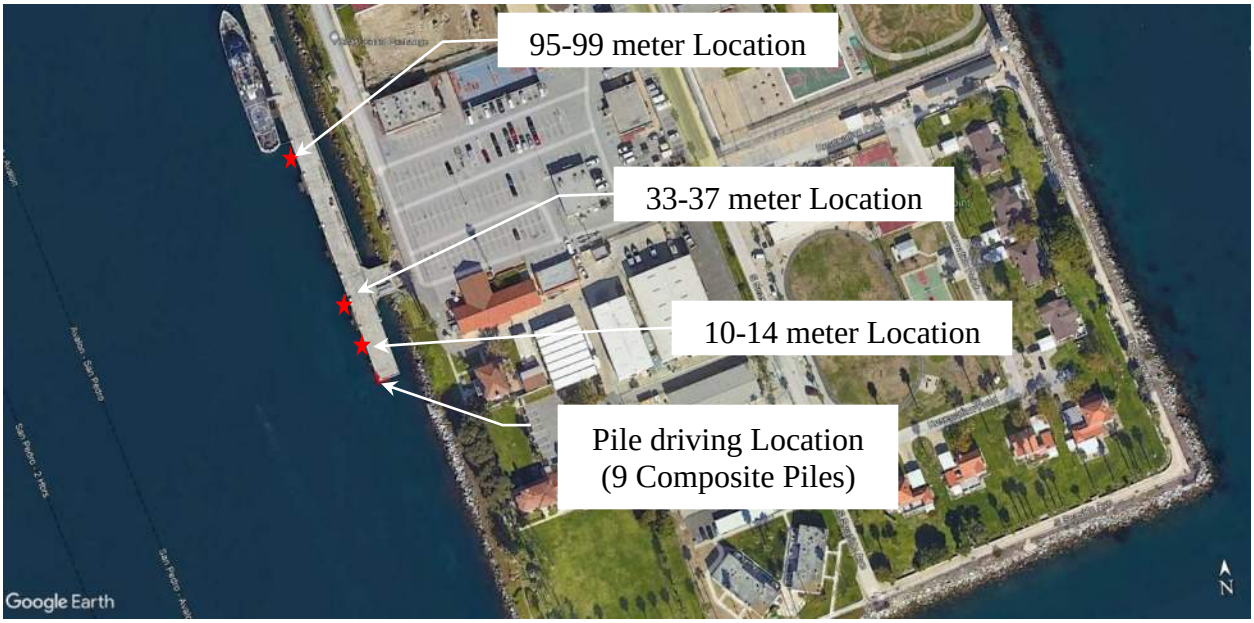


Figure 2: Measurement Positions

Measurement Results

Ambient measurements were made from 09:47 to 10:15 on January 25, 2023, at 95 meters from the construction site along the existing dock.

Table 2 presents the results of the pile driving measurements. There were many dead blows in addition to the pile driving and some of the quieter strikes may not have triggered acoustical algorithms used to detect pile strikes. Data analysis indicate about 442 pile strikes, depending on the triggering system to detect acoustic pulses.

Pile driving began around 10:15, with a series of 4 dead blows, and consistent pile driving beginning about 10:17 and occurring at 9 different times until 11:00 when pile driving was completed. The longest continuous pile driving lasted a little over one-minute. There was about 10 minutes of pile driving spread out over about 45 minutes

Note that sound measurements of pile driving were clearly audible at 95-99 meters from the pile. However, ambient sounds in the area included snapping shrimp that make very short, high amplitude sounds using their claw. Sounds from snapping shrimp are produced by the popping of a bubble that is produced when the larger claw opens and closes rapidly. There are numerous shrimp in the area around the pile driving activity producing snapping sounds that are almost constant with peak sound pressures of 140 to 170 dB. Pile driving sounds, which have greater acoustic energy, make peak sound pressures around 170 dB at 95-99 meters from the pile. The acoustic algorithms used to detect pile driving pulses are masked by these ambient sounds such that the RMS sound pressure level for each pile driving pulse cannot be accurately measured. Therefore, the impulse detector of the sound level meter was used to provide an estimate of pulsed RMS levels. This likely provides an overestimate due to the inclusion of non-pile driving sound and the shorter RMS averaging duration employed by the impulse detector.

Distance to Thresholds

As per the NMFS guidelines, impact driving SEL level per strike below 150 dB would not accumulate enough energy to cause any significant impacts to fishes in the area. This would apply to measurements made at 95-99 meters since the SEL levels are below 150 dB. The 206 dB threshold was not exceeded anywhere as maximum peak levels at 10 meters were 194 dB or lower.

For marine mammals, Level A effects occur for Phocid pinnipeds at an accumulated SEL (weighted for frequency) of 185 dB and at 203 dB for Otariid pinnipeds. Based on all measurement points, the transmission loss for cSEL was computed to be 20* Log10 (distance). The distance to thresholds for cSEL and RMS levels were computed and shown in Table 3 and the calculations are shown in **Attachment F**. Note these distances to the thresholds are based on results from all the pile driving.

Table 2 - Daily Data Summary Sheet for Impact Pile Driving Activity Composite Piles A through I, January 25, 2023

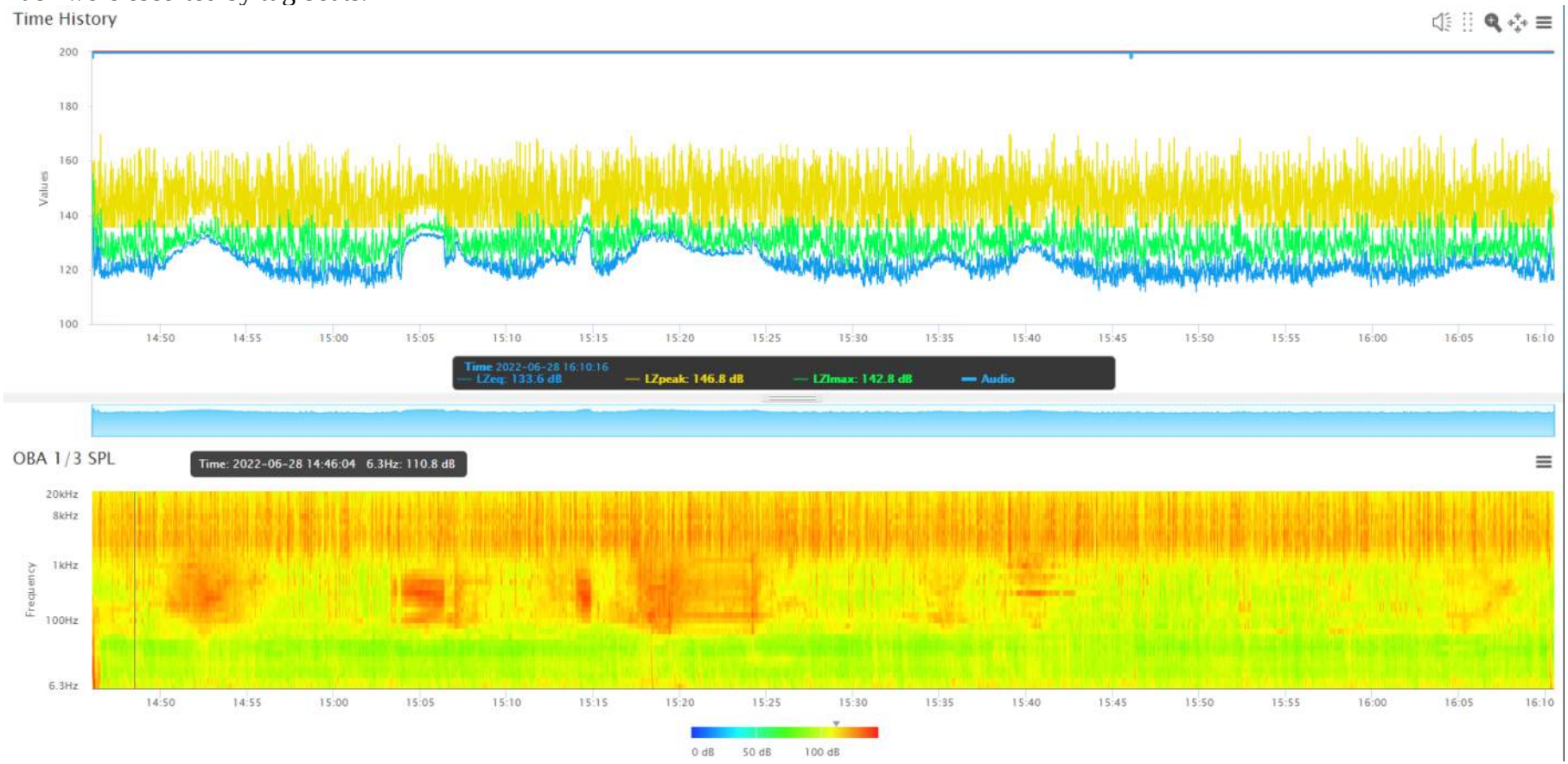
Time	Pile ID	No. of Strikes	Measured Distance to Pile (m)	Depth (m)		Peak (dB)		SEL (dB)			RMS (dB)		
				Water	Sensor	Max	Median	Max	Median	cSEL	Max	Median	Duration
10:14 - 11:00	Fender Piles A through I (9 Piles)	442	10-14	8	4	194	188	166	162	189	179	174	0.0565
					7	--[A]	--[A]	167	164	191	179	176	--[A]
			33-37	8	4	186	181	160	155	182	173	168	0.0551
					7	188	182	162	158	184	174	170	0.0612
			95-99	8	4	174	169	148[B]	143[B]	170[B]	161[C]	156[C]	--[D]
					7	--[D]	--[D]	--[D]	--[D]	--[D]	--[D]	--[D]	--[D]
AMBIENT MEASUREMENTS[B]													
6/29/2022 14:45 to 15:15	--	--	--	8	5	172	--	--	--	125 Cont. Leq (80 min)	--	--	--

[A] Peak data was clipped at 187 dB
[B] Single strike sounds less than 150 dB do not accumulate to cause injury to fish, marine mammal cSEL only.
[C] Estimated based on impulse level measured by SLM
[A]utonomous unit failed to record

Table 3: Distance to Applicable Underwater Noise Thresholds Impact Pile Driving Activity

Pile	187 dB cSEL Fish	185 dB cSEL Phocid Pinniped	203 dB cSEL Otariid Pinniped	160 dB RMS Behavior
Fender piles	16	16	2	62

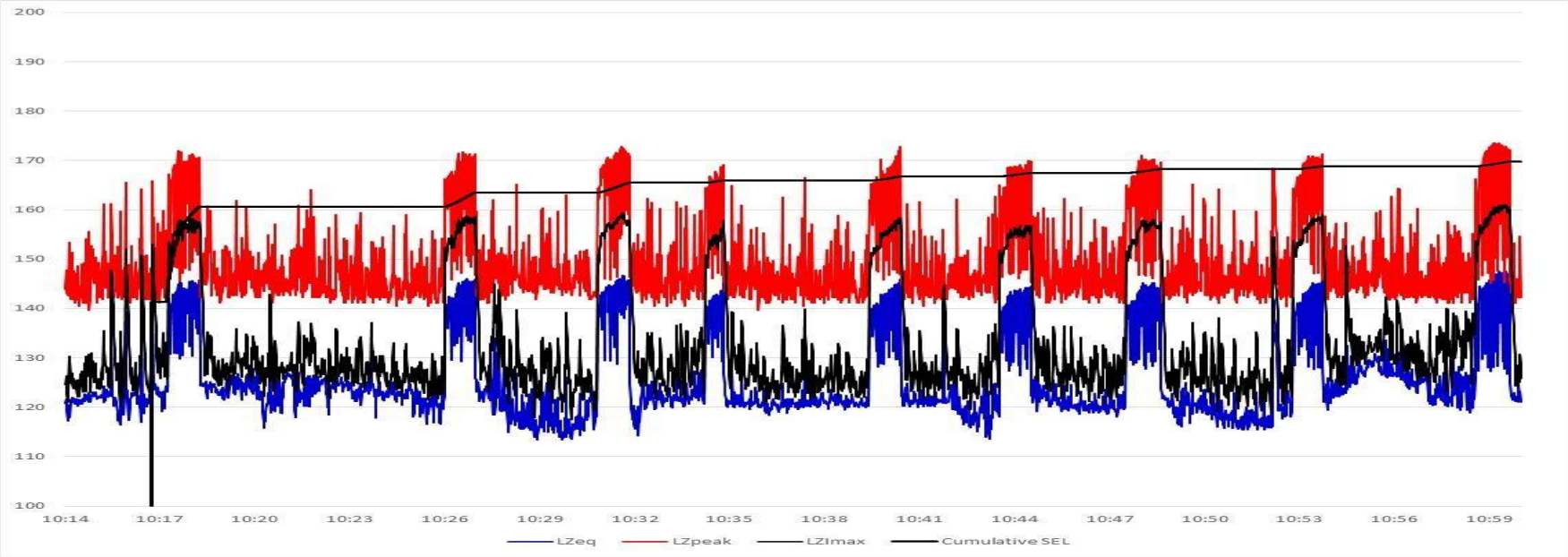
Attachment A - Ambient Measurement at 110 meters from construction on June 29, 2022. Note various vessel passages, with large vessels passing at 14:50-55 and 15:03-08, 15:15, and 15:17-25. A large container ship passed 137m at 14:05 and another at 155m at 15:15. Each were escorted by tug boats.



Attachment B - Measurements at 10 -14 meters from the pile (mid depth) Piles A – I

Attachment C - Measurements at 33-37 meters from the pile (mid depth) Piles A – I

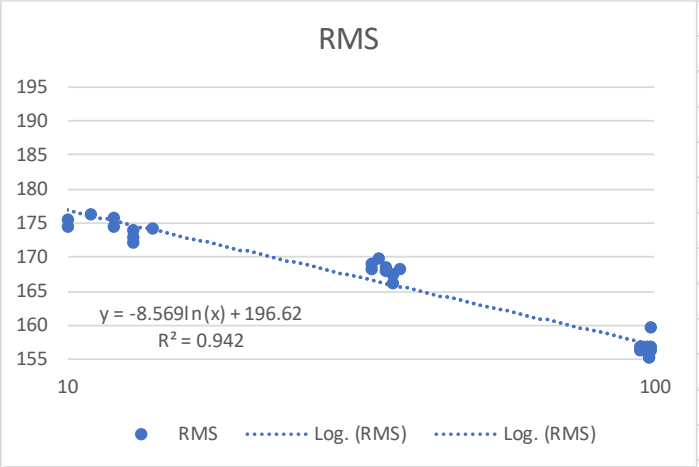
Attachment D - Measurements at 95-99 meters from the pile (mid depth) Piles A – I

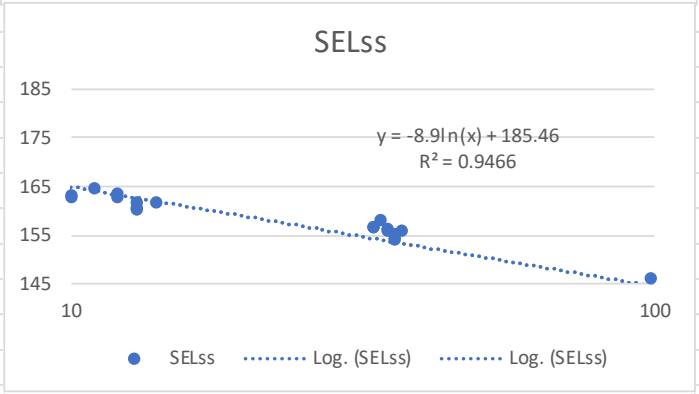


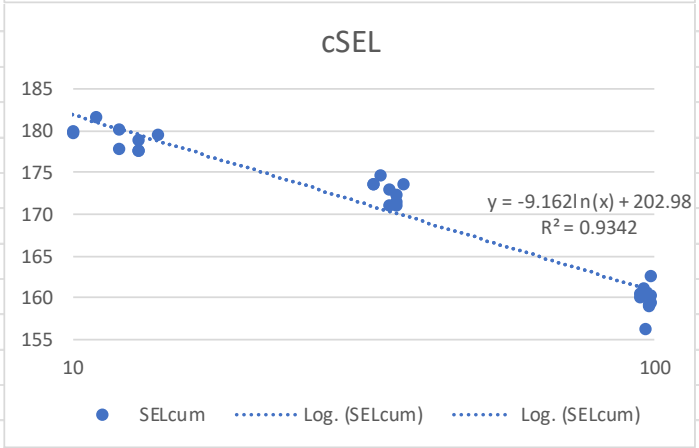
Attachment E - Threshold Distance Calculations

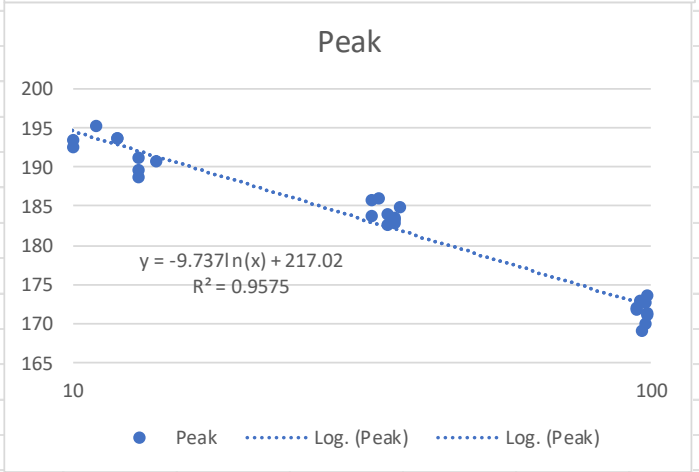
Composite piles
25-Jan-23
Piles A-I

Distance	Peak	RMS	SELstrike	SELcum
10	194	174	163	180
10	193	176	163	180
11	195	176	165	182
12	194	175	163	178
12	194	176	164	180
13	191	174	162	179
13	189	172	161	178
13	190	173	160	178
14	191	174	162	179
33	184	168	157	174
33	186	169	157	174
34	186	170	158	175
35	184	168	156	171
35	183	169	156	173
36	184	168	155	172
36	183	166	154	171
36	183	167	154	171
37	185	168	156	174
95	172	156	144	161
95	172	157	144	160
96	173	157	144	161
97	169	154	142	156
98	173	155	143	159
98	170	155	143	159
99	171	156	144	160
99	171	157	144	159
99	174	160	146	163
Ln	9.737	8.569	8.9	9.162
Log10	**22.4**	**19.7**	**20.5**	**21.1**
SL	217.02	196.62	185.46	202.98
10m	194.6	176.9	165.0	181.9
Distance to 187 dB SELcum			16	
Distance to 160 dB RMS			62	









IMPACT PILE DRIVING REPORT

VERSION 1.2-Multi-Species: 2022

16-inch composite piles for the USCG Port of LA project 22-079

PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN

(if OTHER INFO or NOTES get cut-off, please include information elsewhere)

PROJECT INFORMATION	PEAK	SELss	RMS
Single strike level (dB)	194	163	175
Distance associated with single strike level (meters)	12	12	12
Transmission loss constant	21		
Number of piles per day	9		
Number of strikes per pile	50		
Number of strikes per day	450		
Cumulative SEL at measured distance	190		

OTHER INFO: Nine 16-inch composite piles January 25, 2023

NOTES: 0

Attenuation: 0

RESULTANT ISOPLETHS

(Range to Effects)

FISHES

	ONSET OF PHYSICAL INJURY			BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth		RMS Isopleth
		Fish ≥ 2 g	Fish < 2 g	
ISOPLETHS (meters)	3.2	15.8	24.6	186.1
Isopleth (feet)	10.6	52.0	80.6	610.4

Fishes present

SEA TURTLES

	PTS ONSET		BEHAVIOR
	Peak Isopleth	SEL_{cum} Isopleth	RMS Isopleth
ISOPLETHS (meters)	0.2	2.5	12.0
Isopleth (feet)	0.6	8.1	39.4

Sea Turtles present

MARINE MAMMALS

	LF Cetacean	MF Cetaceans	HF Cetaceans	PW Pinniped	OW Pinnipeds
PTS ONSET (Peak isopleth, meters)	0.8	0.2	5.0	0.9	0.2
PTS ONSET (Peak isopleth, feet)	2.5	0.8	16.4	2.8	0.6
PTS ONSET (SEL_{cum} isopleth, meters)	24.5	2.3	27.8	15.7	2.4
PTS ONSET (SEL_{cum} isopleth, feet)	80.5	7.4	91.2	51.5	7.9
	ALL MM	MF Cet. present	HF Cet. present	Phocids present	Otariids present
Behavior (RMS isopleth, meters)	62.2	LF Cet. present			
Behavior (RMS isopleth, feet)	203.9				