

SUBMITTAL RECORD

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

DAT Feb	E: ruary 14, 2023
SIG	NATURE:
х	Grace Bowman

CONTRACTOR'S USE:

Date:	2/14/23 Project: USCG Wharf Extension			Contract #:	70Z04718DGILBAN00
Submittal	No: 56 Rev. No: 0 Spec. Section:			Dwg. No:	
Subcontra	actor / Supplier: WRA / Illingworth & Rodkin			Copies:	Electronic
Title:	Marine Mammal Monitoring & Hydroacoustic Report				
Item	Description (Describe Topic and Contents of Submittal)	(see		riewer's Action for comments,	_
		NET	MCN	REJ	R&R SUB
1	Marine Mammal Monitoring Report – WRA				
2	Hydroacoustic Monitoring Report – Illingworth & Rodkin				
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SUBMITTAL RECORD

LEGEND

Reviewer's Remarks:



MEMORANDUM

то:	Scott Williams	FROM:	Patricia Jaramillo Project Biologist WRA, Inc.
cc:	Michael Nieto Southern California Natural Resource Director WRA, Inc.		
DATE:	February 10, 2023		
SUBJECT:		utter (WH	for the Base Los Angeles Long Beach EC) wharf Project (NMFS Ref. No. WCRO- 728-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.

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

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

	Active Pi	le Driving	
Species	No	Yes	Total
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

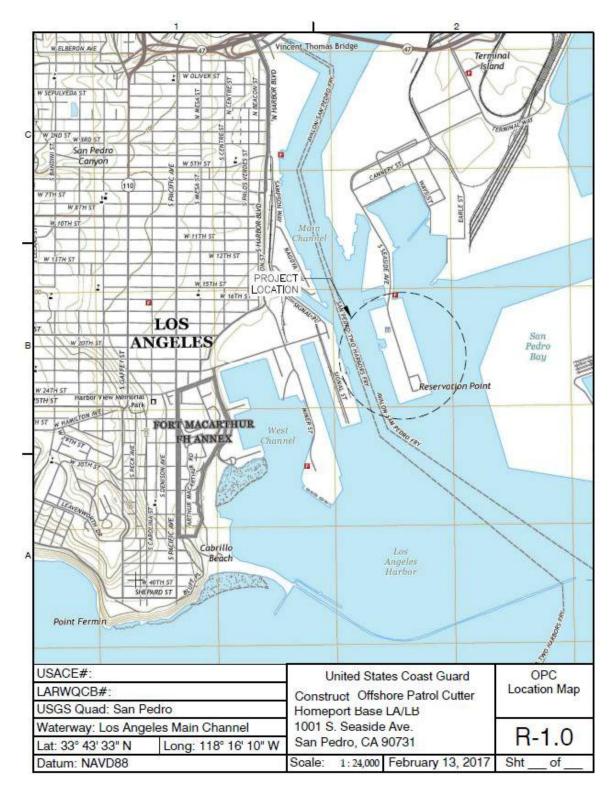


Figure 1. Map of the Offshore Patrol Cutter Project location at USCG Base LA/LB inside of the dotted circle and within the eastern edge of Los Angeles Harbor's Main Channel at Reservation Point



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.



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



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



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

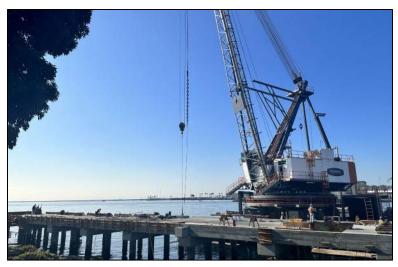




Fender pile pulling at the Project Site on November 3, 2022. Facing west.



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



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



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



Appendix C. Monitoring Logs

UN 22 Observer: party Jaramillo 7:00 am Daily Start Time: 4:30 pm General Weather AM ST CLOUDY Daily End Time: 8.15 pm PM SUNNY , WAYM Dir. of Activity Resight? Notes/Other Human Activity Age Dist Beh Buoy# # of Ind HO Time Species Ind Bear Sex Travel/ (Y/N) Beh Type Beh Class Time Census Water above water activities only N 1 9:01 CSL 40m 2480 J U WEST S SW 1 N 2 9:23 CSL WEST S SW 1 40m 270° U V N 3 W:25 CSL wests sw 70m 208 U N 4 11:02 CSL 228 V EN SW 300 J N 5 11:07 CSL J EN SW 50 166 V 6 11:18 V E N EW CSL 1 50 205 N RN SW CSL 1 264 U 7 2:02 20 V 8 9 10 11 12 13 14 15 16 17 18 19 20 Species Abbreviations CSL CA Sea Lion CSL 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 Unknown Other Other Species UDOL Unknown Dolphin ULWH Unk Large Whale Risso's dolphin PGW **Pacific Grey** CLT CA Least tern PHS Harbor Seal CMD Common Dolphin Unknown Pinniped Whale

Sheet 1 of ___

PWS Pac White-sided Dolphin

Observer: patty J. Daily Start Time: ___9am General Weather AM Cloudy 169 Daily End Time: 4:30 pm PM partly cloudy Dir. of Activity Resight? Dist Notes/Other Human Activity Age # of Ind HO Buoy# Ind Beh Species Bear Sex Travel/ Type (Y/N) (m) Class Beh Beh Water Time Census no pile driving occurred JAS SM CSL 10:54 520 228 N U CSL 11:20 N 360 251 SW V V CSL 12:30 SW 340 221 V U dredging activities 5 6 8 9 10 11 12 13 14 15 16 17 18 19 20 Species Abbreviations GST ELS N. Elephant Seal Green sea turtle Mixed **Multiple Species PWH** Pilot Whale Dead CSL CSL CA Sea Lion Other UDOL Other Species Unknown Dolphin ULWH Unk Large Whale Stellar Sea Lion Unknown CBD Coastal B'nose Dolphin SSL PHS Harbor Seal CMD Unknown Pinniped **PGW Pacific Grey** CLT CA Least tern Common Dolphin RDO Risso's dolphin Whale

Sheet 2 of ___

Pac White-sided Dolphin

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Pac White-sided Dolphin

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	PWS	Pac White-	sided Do	lphin															

Sheet ____ of ____

Sheet ____

Date: 1118

Observer: PT

AM Cloudy 1 47

PM Sunny 72

General Weather

Daily Start Time: 6.30 cm
Daily End Time: 4:20pm

	Time	Species	# of Ind Water	# of Ind HO	Dist (pi)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2º Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
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	6.37	CSL	2		10	330			N	8W					2	13
	10:55	CSL	1		120	310			N	SW					2	
	10:57	CSL	1			200			5	SN					2	
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1	12:44	csl	-1		50	310			2	SW					2	27.
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Species Abbreviations

CSL CA Sea Lion CSL CBD Coastal B'nose Dolphin

SSL PGW Pacific Grey Whale

Dead CSL Stellar Sea Lion

Unknown CA Least tern

N. Elephant Seal

GST Green sea turtle Other Other Species

Harbor Seal

PHS

Mixed UDOL CMD

Multiple Species Unknown Dolphin

Common Dolphin

PWH ULWH

UPIN

Pilot Whale Unk Large Whale

Unknown Pinniped

Risso's dolphin Pac White-sided Dolphin

RDO

Observer: \$\P\J Daily Start Time: 6.30am General Weather AM SWIN VV Daily End Time: ____U'. 30 pm sunny, 74 PM Notes/Other Human Activity Resight? Activity Dir. of Buoy# (Y/N) Beh Type # of Dist (mi) Travel/ Beh Beh Bear Sex # of Ind HO Time Ind Class Species Census Time and the Water no in water 5 SW 100 224 worke at 7:03 CSL SW 5 204 N 10 SW N 20 208 2 observation SW N 250 100 N 824 5 205 30 SW 205 N 30 BW 600 230 SW 224 80 9 10 11 12 13 14 15 16 17 18 Pilot Whale PWH **Multiple Species** 19 Mixed Unk Large Whale Green sea turtle ULWH GST ELS N. Elephant Seal Unknown Dolphin 20 Species Abbreviations UDOL Unknown Pinniped Other Species Dead CSL UPIN Other Common Dolphin Unk Unknown CMD CA Sea Lion Harbor Seal Stellar Sea Lion CSL PHS CLT CA Least tern Coastal B'nose Dolphin SSL Pacific Grey CBD PGW Risso's dolphin Whale RDO

Sheet ____ of ____

Pac White-sided Dolphin

Observer: Daily Start Time: 70M sunny, 67 General Weather AM Daily End Time: 5:15 pm sunny, windy, 73 Notes/Other Human Activity Resight? Activity Type Dir. of Beh Buoy# Age Class Dist (m) Travel/ Beh Beh Bear Sex # of Ind HO Ind Time Time | Species Census Water noin the act. SW pile driving 70 224 1 7:0800 CSL no in the act 80 N 100 230 2 8:48 CSL SW 70 240 3 Dam CSL SW 30 1210 4 10:20 CSL S SW 50 240 5 10:40 CSL N 50 190 6 10:49 CSL N 70 216 50 218 7 11-24 CSL 5 8 11.28 CSL 92 9 4:59 CSL 7 50 146 10 5:00 CSL 11 12 13 14 15 16 17 18 19 Pilot Whale Multiple Species Mixed Green sea turtle 20 Species Abbreviations Unk Large Whale ELS N. Elephant Seal GST Unknown Dolphin ULWH Dead CSL UDOL Other Species Unknown Pinniped CSL CA Sea Lion Other Unk Unknown Common Dolphin Stellar Sea Lion Harbor Seal CBD Coastal B'nose Dolphin PHS CLT CA Least tern Pacific Grey RDO Risso's dolphin Whale PWS Pac White-sided Dolphin

Sheet ____ of ____

Observer: P7 Date: General Weather AM partly Cloudy, late Daily End Time: 4.15 pm PM clear, smny, 70 Notes/Other Human Activity Resight? (Y/N) Activity 2 Beh Buoy# Type Age Class Travel/ Dist (m) Beh Sex Time Bear # of Ind HO no in-water pile Ind Census Species Time F SW N 110 248 1 7:38 CSL N 200 226 2 7:57 CSL 50 150 50 222 4 8:49 N 350 226 5 9.06 S 100 190 6 9:14 S 90 270 S 200 244 8 (:37 S 30 204 9 2:46 10 11 12 13 14 15 16 17 18 Pilot Whale PWH Multiple Species 19 Mixed Unk Large Whale Green sea turtle GST ULWH Unknown Dolphin ELS N. Elephant Seal 20 Species Abbreviations Unknown Pinniped UDOL Other Species UPIN Dead CSL Common Dolphin Other Unk Unknown CMD CSL CA Sea Lion Harbor Seal Stellar Sea Lion PHS CLT CA Least tern CBD Coastal B'nose Dolphin SSL Pacific Grey Whale RDO Risso's dolphin PWS Pac White-sided Dolphin Sheet ____ of ____

ate: 8172 General Weather AM

Observer: Eliza Schlein

67, cloudy

Daily Start Time: 7:15 am

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	Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
		Water													no in water pile driving
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	ICSL	1	0	10	197	M	UK	336	SW					-	no pile driving within 15 minus
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1 /	Species Abbreviation	ons				222	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
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C	SL CA Sea Lion	CSL	Dead CSL				Other Species	UDOL	Unknown Dolphin	ULWH	Unk Large Whale
_		. 001	Stellar Sea Lion	Unk	Unknown	Other	Other openies		a Delable	UPIN	Unknown Pinniped
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- 3		PGW	Pacific Grey	CLT	CA Least terri	191022000					
R	RDO Risso's dolphin	,	Whale								

PWS Pac White-sided Dolphin

Sheet ____ of _

Observer: Eliza Schlein Date: 8/23 Daily Start Time: 6:56 am General Weather AM 66, Cloudy Daily End Time: 17:15 Resight? Notes/Other Human Activity Activity Beh Buoy# Travel/ Bear Type Ind # of Ind HO Beh Time Species Class Beh Census Water No in waterpile driving 128 Unk 7:08 CSL 325 190 Unle 7:13 CSL 148 unk 223 UNK 7:30 CSL 339 P.SW 190 Unk Unk leaving also often soft stant 120 4 7:40 CSI 162 Vak pile driving still paused 314 Unk Unk SHSW 180 8:07 CS1 307 no in water pile driving adult 232 M 7 8:27 CSI 284 UNK UNK 110 8 9:09 CSL 214 UNK 50 9 9,40 CSL 160 UNK 189 10 9:48 CSL SW adult M 214 11 10:05 (5) SW. L adult 253 M.F 12 10:14 (5) 264 177 Unh 13 10:35 CSL 14 0:43 056 Light before soft start water plante UNK Unh 304 15 11:00 CGL SW adult

19 13:46 (5) Pilot Whale Multiple Species 20 13.58 CSL Mixed Green sea turtle Unk Large Whale ELS N. Elephant Seal GST Species Abbreviations Unknown Dolphin UDOL Dead CSL Unknown Pinniped Other Species Other CSL CA Sea Lion Unk Unknown Common Dolphin CMD Stellar Sea Lion Harbor Seal PHS SSL CBD Coastal B'nose Dolphin CLT CA Least tern PGW Pacific Grey RDO Risso's dolphin

310

268

204

Unk

Unh

Unle

Una

SW

SW

SW

SW

PWS Pac White-sided Dolphin

16 11.19 CS

17 11:53 CSI

13.19 CSL

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212

100

	Ger	neral Wea		AM 60 PM 74		1				_ Da	aily St aily Er	art Tim	e: <u>6.5</u>	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
t	15:24	UDOL	1	0	90	200	Unk	Unk	206	PP						Alo in worker pile diving Ouring driving while pared After pile diving completed
t	6.04	CSL	1	0	130	288	W	udult	148	SW						During driving Well passed
	6:45		1	0	30	206	Unk	Unk	331	SW						After give diving range office
ľ	-		1													
				7.5												
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							7.7									
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	L C	pecies Ab		CSL	Dead CS		ELS	N. Elephan	t Seal	GST			sea turtle	Mixed	Multiple S	
D	O R	oastal B'no isso's dolpi ac White-sid	nin	PGW	Stellar S Pacific G Whale	at zavinitatio	Unk	Unknown CA Least to	ern	Other		Other S Harbor	Species Seal	CMD	Unknown	The same and a strictle

			РМ	4,00	urn) clow	dy		_ Da	ily Er	d Time	e: <u>4;3</u>	4 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)	Note	s/Other Human Activity
7:25	CSL	1	Ð	150	298	Unh	Unk	334	SW						No in	water work
8:01		1	0	15	275	M	adult	306	SW							
3136	4	1	Õ	10	152	Unh	Unk	160	SW						Noins	water pile driving
:00	CSL	2	0	160	314	Unh	UNK	336	GW						ouring pause	1 2 dreat blows during
1:09	CSL	i	0	30	1860	Unle	Unk	379	SW						, , ,	to Lety pile in place
35	CSI	1	0	100	197	() Ne	Vak	296	SW						During pile	drived work stopped
1:37	CSL	1	D	20	195	Unk	Unle	164	SW						Noin	water pile driving
1:58	1	1	0	150	223	M	adult	325	SW		A	1000				1 1
42	CSL	2	0	56	200	Unle	Unk	321	SW						Ouring elsin	ing wah stopped
10,	(SL	1	0	20	292	Unk	Unk	140	SW						No in w	
10.6	CBD	2	0	76	226	Unk	Unk	319	5W	-				4-13:13		1
11:	CSL	1	0	30	170	W	adult	317	SW							
:46	CBD	2	Ò	10	207	()nh	Vale	310	SW							
:38	CSL	2	0	70	174	Unk	Unk	293	SW					4-14:41	1	
45	CSL	1	0	20	218	M	Unk	297	SW							
:56	CSL	1	0	80	166	Unk	Unk	228	SW							
	CSL	2	0	20	193	Unh	Unk	368	SW							
33	CSL	1	0	40	190	Μ	Unk	258	SW							
	Species At													1		
	CA Sea Lior		DD	Dead C	20 (808)	ELS	N. Elephan	it Seal	GST		Green	sea turtle	Mixed	Multiple Sp	pecies PW	H Pilot Whale
	Coastal B'ne	- 110	hin SSL	Stellar S	Sea Lion	Unk	Unknown		Other		Other S	Species	UDOL	Unknown I	Dolphin ULI	WH Unk Large Whale
0	Risso's dolp	hin	PGW	Pacific (Grey	CLT	CA Least to	ern	PHS		Harbor	Seal	CMD	Common I	Oolphin UP	

Sheet ___ of ___

Date: 8/25/22 Observer: Eliza Schlein

General Weather AM 69, PacMy (180dy PM 76, Sunny

Daily Start Time: 7AM

Daily End Time: 16 以8

10000	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
+	7:26	CSL		0	25	214	Unk	Unk	281	SW						No in water pile driving
	7:35			Õ	140	195	Unk	Unk	332	L	SW					
	7.43		1	Ö	130	174	Unk	Unk	110	SW					4-1111	
ţ	LH1	-	1	0	10	156	M	UNK	153	SW						lolow to min in to keep tocation
1	7:56		1	Ó	10	194	Unk	Unk	176	SW						
	8:30		1	D	80	195	Unu	Unk	135	5W			-	-		During driving Work stopped During powse in work. Youse Pringle
		CSL		0	46	101	Unh	Unk	306	9W						No in water pile driving
	9:01	CSL	1	0	OP	209	Unh	Unk	312	SW	-		-			NO III WOLLEY PLIP SILLENS
-	9:101	CSL	1	0	10	155	W	Unle	124	SW	-	-				
K	7:16	CSL	1	0	35	213	Unk	Unle	305	SW	-		-	-		
1	9:36	CSL	1	0	10	218	W	adult	294	SW	-				4-9:43	
	9:39	CSL	-1	0	80	210	Unk	UNK	316	SV					1 1 1	
1	9.52	CSL		0	20	224	W	jw	143	SW			104		1	
	10:07	CSL	1	0	40	180	Unk	Unk	173	SW						
	11:18		1	0	20	212	Unk	Unk		SN						During in water rock remove
	5:12		1	2	150	300	Unk	Unk		GW						3
1	15:47		1	0	30	222		Unk	161	SV	J					
1	6:15	CSL	1	0	10			Unk								1 (6)
1	16:14	PHS		0	40	100	UNIL	0110	300							
		Species													Multiple 5	Species PWH Pilot Whale

UDOL Other Unk Unknown Stellar Sea Lion Unknown Pinniped CBD Coastal B'nose Dolphin CMD Common Dolphin Harbor Seal PHS Pacific Grey Whale Risso's dolphin

PWS Pac White-sided Dolphin

Sheet	of

Date: 8 29

Observer: PJ

General Weather AM 68, Movey

Daily Start Time: 7 am

Daily End Time: 3:45 pm

8	7:38	CSL CSL	1		1	Bear	Sex	Age	Travel/ Census	1 Beh	2 Beh	Beh Time	Buoy#	Туре	(Y/N)	La ball work
8	7:38		1		ft	101			N	SW			-		N	no in the work
8	7:38	CSL	-	0	250	186			5	T)		N	no in the will di
8	3:02		1	1	50	182			3						~	stopped pile dr.
8		CSL			20	184			5	\vdash					17	stanged mile dr.
11	14 10	CSL			476	170		-	N						4	stapped pile dr.
1.1		CSL			50	226			S	1			1		N	noin the work
1.3.5	1:56				150	188			N	4					N	NO III BY
			1	7	150	200			10	1.4						
15	:35 (36								1						The same of the same
1	-													10	1.00	
			-									The state of				
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	1		-+												-	
	T															Species PWH Pilot Whale
	1												sea turtle	Mixed	Multiple :	Species Whale
_	+							N. Elephan	t Seal	GST				UDOL	Unknow	n Dolphin
	Spec	ies Abbre	eviation	S	Dead CSL		ELS			Other			Species	CMD	Common	n Dolphin UPIN Unknown Pitting
	OA S	ea Lion		CSL	Stellar Se	noi 1 e	Unk	Unknown		PHS		Harbo	r Seal	Cino		
SL	CAS	ou Diverse	Dolphin	SSL	Stellar Se	a 2.10	CLT	CA Least to	rn							
BD	Coas	tal B'nose	Doip	PGW	Pacific Gr	ey	-									
20	Risso	's dolphin /hite-sided		1	Whale											

Sheet ____ of _

		eral Wear	ther A	06 AM 66 PM 7	, 6	3000	A 5	unny		. Dai	ly Sta	irt Tim	e:	i. 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)		Other Human Activ
-	-	551			_	05.6			5	SW					22	noin	HOO WOYK
		CSL	1		00	266			5	SW					N	1	
		CSL	1		1200	310		-	N	10	SW				4		
	7:15		1		10	204		_	N	10	SW				9		
	7:17		1		-	2010			N	8W					N		
5	7:18	CSL	2		400			-	S	SW					N	15	
		CSL	1		50			-	9	Sh					N		and the same
		CSL	1		200			-	3	800					N.		,
8	7:5	CSL	2		100	202		-	N	SW	1	1			N		7
9	0:25	CSV	1		10			-	5	SV					N		The Laboratory
10	MO:05	CSL	1		100			-		Sh					Y		170
11	10:2	CSL	2		200				- N	_	-	+			N		
12	10:31	CSL	1		1150	243			_	SW		+		_	N		\vee
13		CSL	-1		12	0 200			N	SV	1	+			N	abys.1	eaving than
14		CSL	1		10	170			S	_	/	-			IN	non	Had won
15	2.1	CSL	- 1		200	2603	5		N	SV		+	+		N		in chann
10	3.50	CSL	- 1		80	192			S	SY	7	_	-	-		actor	rijedrive
10	UU	NISL	1		121	0 251			N	1	4	-	-	_	10	Alter	ble dr.

Species Abbreviations

CSL CA Sea Lion Coastal B'nose Dolphin CBD

19 20

RDO

Risso's dolphin

PWS Pac White-sided Dolphin

Dead CSL

Pacific Grey

Whale

CSL DD

SSL

PGW

20 280

Stellar Sea Lion CLT CA Least tern

ELS N. Elephant Seal Unk Unknown

GST Other PHS

SW

Green sea turtle Mixed Other Species

Harbor Seal

UDOL Common Dolphin CMD

Multiple Species

Unknown Dolphin

Pilot Whale Unk Large Whale

ULWH Unknown Pinniped

Sheet ____ of

Date:	8/31	Observer	PT	
Date.			1000	

General Weather AM SUMM, USE

Daily Start Time: 70000
Daily End Time: 12:30 pm

Time	Species	# of Ind	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy#	Activity Type	(AIN)	Notes/Other Human Activity
	Openic	Water		F4										V	no in the act.
	- ()	1		150	248			5	SW					N	1
7:14	-	1		50	323			S	800					4	
7:1=		4		100	325			N	SW					N	1/
7:10		_		750				S	SW		-			~	2
8:0		2		100	200			N	SW	-	-	-			crane issues
8-14	CSL	1		100					-	-	-	-			
		+							_	+	-	-			
				-						-	-	1			
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-	-	_													
		_													te Species PWH Pilot Whale
		t - Abbre	eviations				LS N. El	ephant Seal		SST	G	reen sea t	urtle Mix		le Species PWH Pilot Whale own Dolphin ULWH Unk Large Whale

CSL CA Sea Lion CBD Coastal B'nose Dolphin

PGW RDO Risso's dolphin

Dead CSL Stellar Sea Lion Pacific Grey

Whale

Unk Unknown CLT CA Least tern Other PHS

Harbor Seal

PWS Pac White-sided Dolphin

Sheet ____ of ____

Date: 47 Observer: PT

General Weather AM SWMy, 72°

PM Cloudy, 84°

Daily Start Time: 7am

Daily End Time: 4.30pm

Common Dolphin

UPIN

Unknown Pinniped

Tim	e 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
8:0	CSL	1		220	194			N	8N					N	noin the act
8.1	-	- 1		200	348			N	8W					N	1
8:1		1		100	340			N	5W					N	
8:2		2		250				N	SW					N),
8:3		1		300				N	SW					N	V
10:0		- (150	304			2	SW					N.	North Mary and Madage
[[100				S	80					N	obys leaving channel
12:0		-		50	184			N	8W					N	no in thoact
2:4		7		150	190			5	SW			-12		N	
4:0		7		200	6 19			5	SW			ш		N	
1.0	CS	,		100	224			N	80		7.5			N	The state of the s
														10	
				-							100				
											0.0	616	Thibu	100	
											TOPE				The second second
CSL	Species A CA Sea Lic	n	CSL	Dead C	SL	ELS	N Flori							WILL SE	A CANADA
RDO	Coastal B'nose Dolphin Risso's dolphin		ohin SSL PGW		Sea Lion	Unk	N. Elephar Unknown		GST Other			sea turtle Species		Multiple S	
PWS	Pac White-	Pac White-sided Dolphin		Whale	,	CLT	CA Least t	ern	PHS		Harbo		UDOL	Unknown Common I	Dolphin ULWH Unk I ame ton

Sheet ____ of ____

Date: _9/8_	Observer:			
General Weather	AM Cloudy, 80°	to, 730	Daily Start Time:	Fam
	PM_cloudy, 90)	Daily End Time:	

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity	
-	7:5) 0	CSL	-		70	164											
4	10:27		1		50	243			S	SW					N	noin the act	
4	11:27	CSL	2		200	194			N	300	_				N		
4	11:33		2		250	230			N						N		
1	11:45	CSL	1		150				-						^		
1	12:05		1		120	264			N						N		
1	2:22	CSL	3		100	246									N	4	
	3:45	CSL	1		300	190			N						2	no in the act	
1	3:60	CSL	1		150				5	\vdash					~	no in the act	
1	1:12	CSL	(250				5						10		
T	714	CSL	1			181	-		2	W					N	V	
Ť	11-10	000	-		270	181			'S	SW					N	no in the act	
t						_										107	
t						-											
H			_			_										90	
H			-			-										367-	
-	-	-															
-			_														
	_																
													500			D ₂	
		pecies Ab															

	Species Abbreviations										
CSL	CA Sea Lion	CSL	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			10.73.75 - 15.73.75 - 15.75 -
RDO	Risso's dolphin	PGW	Pacific Grey	CLT	CA Least tern				Unknown Dolphin	ULWH	Unk Large Whale
,,,,,	rado o dospinii	1000	Whale	CLI	CA Least tern	PHS	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
PWS	Pac White-sided Dolphin		***************************************								

Sheet

	Gen	eral Wea	ther A	AM Part DM 100%	14 C	(ovd	ain			Daily Start Time: 0700 Daily End Time: 15:00								
1	101 1		# of	# of Ind HO	Dist	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy#	Activity Type	Resight? (Y/N)			Human Activity
1	Time	Species	Water	# Of mid-	(m)											ho	in Had	Astery
1			1		3	200	FF		F	SW	_						-	
	0734	CSL	1		12	100	W 0002		N	cu	_					_	h	
Į	0736	CSL	1		145	20	2F#		N	SW						_	b	
ļ	1080	CSL	2		20	110	46		~	SW						-	h	
Ì	2507	CSL	4		115	235	M		N	Sh	_					-	-	
E	844	CCL			55	320	M		W	Su	_					-	7.	
Ī	844 1047 1649	CSL			10	200	Μ		N	Sw	_					*1	10000	halted Adiving
	649	CSL	1		S	240			~	Su				THE STATE OF THE S		6.10	2 00.012	Adium
ľ	100	CSL	1		35	200	M		15	54	_					No	MHL	a licit
ľ	1242	CIL	1		130	122	M		>	740		_	- 1			-		
1	1450	CSL			170	1				-	-					-		
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																Cascia	s PWH	Pilot Whale
	-									GS1		Gree	n sea turti	e Mixed	Multiple			Unk Large Whale
			hhraviat	tions	ns ELS N. El				N. Elephant Seal					UDOL	Unknow	u Doibi		Unknown Pinniped
	CSL	Species A CA Sea Lic	DDIEVIA	reviations CSL Dead CSL ELS N. Elephant Seal Unknown SSL Stellar Sea Lion CLT CA Least tern					Other Other Species UDOL PHS Harbor Seal CMD				Common Dolphin UPIN UNANDURA					

RDO PWS Pac White-sided Dolphin Sheet

Jarry, para. cloudy 155 Daily Start Time: 8cm Observer: PJ Daily End Time: ____Spm General Weather AM clear, 78 Notes/Other Human Activity PM Resight? (Y/N) Activity Dir. of Buoy# Beh Type Age Class Travel/ Beh Dist (m) Beh Time # of Sex Bear no in the # of Ind HO Census Ind Species N Water FA 800 70 202 N 800 CSV 8:01 200 181 5 SON 40 208 80 S 70 200 8W N 400 312 BW 5 8:42 50 280 SW SW 70 228 6 9124 MS 60 K87 7 11:25 SN 8 11:38 220 230 halted work til 3:53 S 150 192 9 1110 S 230 208 10 1:18 SN N 11 2:07 3 3:45 12 13 14 15 16 17 Pilot Whale PWH **Multiple Species** Unk Large Whale 18 Mixed Green sea turtle ULWH Unknown Dolphin Unknown Pinniped GST 19 ELS N. Elephant Seal UDOL UPIN Other Species Common Dolphin Species Abbreviations Other 20 Dead CSL CMD Harbor Seal Unk Unknown CSL PHS CA Sea Lion Stellar Sea Lion CLT CA Least tern CSL SSL Coastal B'nose Dolphin Pacific Grey CBD PGW Whale Risso's dolphin RDO PWS Pac White-sided Dolphin

F 310 0:310 0:470	Species CSU CSU CSU CSU CSU CSU	# of Ind Water	# of Ind HO	Dist (pt) 140 80 (00	106 246 20	Sex	Age Class	Dir. of Travel/ Census	1 Beh SW SW SW	2 Beh	2 Beh Time	Buoy #	Activity Type	Resight? (Y/N)	70	Notes/	Other Human Activi
F 310 0:310 0:470	CSL CSL CSL			140 80 100	246 210 190			2 2 5	sw sw						Λο	int	1
0:30	(8) (8)	1 1 1 1 1 1		(80) (00)	246 210 190			N	sw sw								
0:30	(8) (8)	1 1 1 1		(80) (00)	246 210 190			N	SW			77 . 21		V			
0:40	(SL	1 1 1		150	190			S	SW			77 22		-	1		
0.50	CSL	1 1		150	190			_	100			-1		V	1	<i>1</i>	
	CSV	1						_	478						110	124	
9730	CSV	1		100	7.00										14.0		
												m1 - 21			11.0		
															110		
												III in a					
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	pecies A		csL	Dead C	SL	ELS	N. Elephar	nt Seal	GST		Green s	sea turtle	Mixed	Multiple Spe	ecies	PWH	Pilot Whale
2000	CA Sea Lic		DD				Unknown		Other		Other S	pecies	UDOL	Unknown D	olphin	ULWH	Unk Large Whale
BD Co	Coastal B'	nose Dolp	ohin SSL PGW	Stellar S	Sea Lion	CLT	CA Least t		PHS		Harbor	and the same of th	CMD	Common De		UPIN	Unknown Pinnipe

Sheet_

Date: 0 114		bserver		J_				ii. Ch	art Tim	a. 70	m	
General Weather		part.			10_		-		d Time		450	m
# of	PM	Dist	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy#	Activity Type	Resig (Y/N

			F	PMP			dy,	Age	Dir. of Travel/	1 Beh	2 Beh	2 Beh	Buoy#	Activity Type	Resight? (Y/N)			Human Activity
		Species	# of Ind	# of Ind HO	Dist (m)	Bear	Sex	Class	Census	Beil	00	Time			N	no	inthe	
TI	ime	Species	Water		ft		SHE		N	82					· ·	1	+	
0	20	CSV	1		109				S	1							+-	
	38		,		200				S								+	
8	11	CSL	1		50	90			N						1,		1	
_	- ;3	CSU	-		133	230			N						₹/	- 4	9	
	30	CSL	1		300	170			5	4		_						
	.35	CSL	- (250	200					_							
4	: 30	CSL									_	_						
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CSL	Species Abbreviations CA Sea Lion Coastal B'nose Dolphin Risso's dolphin	SSL	Dead CSL Stellar Sea Lion Pacific Grey Whale	Unk	an Least tern	GST	Green sea turtle Other Species Harbor Seal	Milke	Multiple Species Unknown Dolphin Common Dolphin	ULWH	Dinniped	
pws	Pac White-sided Dolphin											

Sheet ___

Date: 91 15		Observer: PJ	Daily Start Time: 1 AM
General Weather	AM	Mady, 71	Daily End Time: 424 pm
	PM_	sunmy,74	Daily Lite 1

	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
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Other

PHS

Unknown

Dead CSL CSL CSL CA Sea Lion Stellar Sea Lion CBD Coastal B'nose Dolphin SSL CLT CA Least tern Pacific Grey Whale

RDO Risso's dolphin

PWS Pac White-sided Dolphin

Harbor Seal

Unknown Dolphin UDOL Common Dolphin CMD

		al Weat	her A	М	Observ	ver) 1 m	,4				Dai	ly Sta	rt Time	- 1ar	M 18 pm	1				
				PM						Age	Dir. of Travel/	1 Beh	2 Beh	2 Beh Time	Buoy#	Activity Type	Resight (Y/N)				uman Activity
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Date: 9120 Observer: 7am Daily Start Time: ___ SUNNY, 40 General Weather AM Daily End Time: ____ Notes/Other Human Activity Resight? Activity Dir. of (Y/N) Buoy# Beh Type Age Travel/ # of Dist Beh Beh Time Bear # of Ind HO Class Ind Census Species (m) no in Had act. Time Water N N 5W 181 156 N 7:14 CSZ SW 190 180 N CSL N 100 210 N CSL 200 200 N CSL N 70 286 N 2 2 90 31 N 205 5 200 7 11:4 300 190 100 9 10 11 12 13 14 15 16 17 18 19 20 Species Abbreviations N. Elephant Seal GST Green sea turtle Mixed **Multiple Species PWH** Pilot Whale CSL Dead CSL CSL CA Sea Lion Other Other Species UDOL Unk Large Whale Stellar Sea Lion Unk Unknown Unknown Dolphin ULWH SSL Coastal B'nose Dolphin CBD PHS Harbor Seal CMD Unknown Pinniped CA Least tern Common Dolphin UPIN PGW Pacific Grey RDO Risso's dolphin Whale Pac White-sided Dolphin

Sheet

Date: 9/21		Observer: PT		
General Weather	AM	SVMMy, 69	Daily Start Time:	8:30
	PM _	sunny, 75	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	Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
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CSL CA Sea Lion CBD Coastal B'nose Dolphin

PWS Pac White-sided Dolphin

CSL

Dead CSL

ELS N. Elephant Seal

GST Other

PHS

Green sea turtle Mixed

Multiple Species Unknown Dolphin

PWH Pilot Whale

Risso's dolphin

SSL Stellar Sea Lion PGW

Pacific Grey Whale

Unk Unknown CLT CA Least tern

Other Species UDOL Harbor Seal CMD

Common Dolphin

ULWH UPIN

Unk Large Whale Unknown Pinniped

Date: 11 3 Observer: PT

General Weather AM Cold, windy 159 Daily Start Time: 1:30 am

PM Cold, Windy 163 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	Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
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CSL CA Sea Lion CSL 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 CLT CA Least tern PHS Harbor Seal CMD Common Dolphin UPIN Unknown Pinniped

PWS Pac White-sided Dolphin

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Ollegt	01

Date: _\\ 4	ObserverPJ		
General Weather	AM_ SUMMY 155	Daily Start Time:	
	PM_ SUNMY 1 COS	Daily End Time: \2:50	

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

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CBD Coastal B'nose Dolphin

RDO Risso's dolphin

SSL

Stellar Sea Lion

Unk Unknown

GST Other Green sea turtle Mixed Other Species UDOL

Harbor Seal

Multiple Species

Pilot Whale

ULWH Unk Large Whale

PWS Pac White-sided Dolphin

Pacific Grey Whale **PGW**

CLT CA Least tern

PHS

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Unknown Dolphin Common Dolphin

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					bserver.			-		Dai	ly Sta	ırt Time	e: 6.	300	m		
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Date: 11 20		Observer: PT	
General Weather	AM	Fam, novely, 54°	Daily Start Time: 74 W
	PM_	64°, cloudy	Daily End Time: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

	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
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Species Abbreviations

CSL CA Sea Lion
CBD Coastal B'nose Dolphin

RDO Risso's dolphin

20

CSL Dead CSL

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PGW

Dead CSL Stellar Sea Lion Pacific Grey Whale Unk Unknown
CLT CA Least tern

GST Other PHS Other Species UDOL
Harbor Seal CMD

Multiple Species
Unknown Dolphin
Common Dolphin

ULWH Unk Large Whale

Unknown Pinniped

PWS Pac White-sided Dolphin

Sheet ___

Date: 12/5

General Weather AM Cloudy, 55°

PM partly cloudy | 61°

Daily Start Time: 6:30 A M

Daily End Time: 3.15pm

	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
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Species Abbreviations

Whale

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

Pac White-sided Dolphin

Date: 12 6 Observer: P5

General Weather AM SUNNY, 46° Daily Start Time: 6:30000

PM SUNNY, 43° Daily End Time: 11:150000

Pac White-sided Dolphin

	Time	Species	# of Ind Water	# of Ind HO	Dist (m)	Bear	Sex	Age Class	Dir. of Travel/ Census	1' Beh	2 Beh	Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
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Unk Large Whale UDOL Unknown Dolphin Other Other Species Coastal B'nose Dolphin SSL Stellar Sea Lion Unknown **Unknown Pinniped** PHS CMD Common Dolphin Harbor Seal RDO Risso's dolphin **PGW Pacific Grey** CLT CA Least tern Whale

Date: 1212 Observer: MS

General Weather AM Cloudy, 48 Daily Start Time: 74M Daily End Time: 11.50 am PM cloudy Dir. of Resight? Notes/Other Human Activity Activity # of Age Buoy# Beh Travel (Y/N) Туре # of Ind HO Bear Sex Species Ind Beh Beh Class Time Census Water no in the act 8W 125 134 N 1 7:48 CSL 100 248 5 9:00 CSL 50 250 SW 9:11 45 SW 125 290 10:43 CSL 0 1 2 3 4 1 2 0 Pilot Whale Species Abbreviations **Multiple Species** Mixed Green sea N. Elephant Seal GST EL Dead CSL CSL CA Sea Lion Unk Large Whale CSL ULWH **Unknown Dolphin** UDOL Other Species Other Unknown Unknown Pinniped Unk Stellar Sea Lion SSL Coastal B'nose Dolphin Common Dolphin CBD CMD Harbor Seal PHS CA Least tern CL **Pacific Grey** PGW Risso's dolphin RDO Whale Pac White-sided Dolphin

Date: 12121 Observer: Pt

General Weather AM Sunny, 47° Daily Start Time: 6:30cm

PM Sunny, 67 Daily End Time: 5 pm

PWS Pac White-sided Dolphin

	Time	Species	# of Ind Water	# of Ind HO	Dist (pr)	Bear	Sex	Age Class	Dir. of Travel/ Census	1' Beh	2 Beh	Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
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Species Abbreviations PWH Pilot Whale ELS N. Elephant Seal GST Green sea turtle Mixed **Multiple Species** CSL CSL CA Sea Lion Dead CSL Unk Large Whale ULWH Other Other Species UDOL **Unknown Dolphin** CBD Coastal B'nose Dolphin SSL Stellar Sea Lion Unk Unknown UPIN **Unknown Pinniped** CMD Common Dolphin Risso's dolphin PGW CA Least tern PHS Harbor Seal **Pacific Grey** Whale

Date: 114123 Observer: MS General Weather AM 59, Cloudy rain Daily Start Time: 74477 Daily End Time: 4.30pm PM_cloudy Dir. of Species # of Ind HO Age Activity Resight? Ind Bear Travel Beh Buoy# Notes/Other Human Activity Class Beh Beh Type (Y/N) Water Census Time 1 1:23 CSL 300 264 225 227 fred no in the owork N 2 1:42 CSL fled N 3 3:48 CS1 SN1 N 3 5 6 0 Species Abbreviations CSL CA Sea Lion CSL Dead CSL EL. N. Elephant Seal **GST** Green sea Mixed **Multiple Species PWH** Pilot Whale turtle Other **Other Species** Unk Large Whale Unk Unknown UDOL ULWH Coastal B'nose Dolphin SSL Stellar Sea Lion Unknown Dolphin **Unknown Pinniped** RDO Risso's dolphin **Pacific Grey** CA Least tern PHS **Harbor Seal** Common Dolphin Whale Pac White-sided Dolphin PW

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				PM_C/U	voly.	00				_ Da	ily En	d Time	e:	Philip					
	Time	The second	# of Ind Water	# of Ind H	Piles	Bear	Sex	Age Class	Dir. of Travel/ Census	1 Beh	2 Beh	2 Beh Time	Buoy#	Activity Type	Resight? (Y/N)	1	Notes/Other I	Human Activity	
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	CSL	CA Sea Lio	n	CSL	Dead C	SL	ELS	N. Elepha	ant Seal	GS	Т	Gre	en sea tu	rtle Mixe	ed Multip	le Species	PWH	Pilot Whale	
	CBD	Coastal B'n	ose Dolp		Stellar	Sea Lion	Unk	Unknow	1	Oth	ner	Oth	ner Specie	s UDO	L Unkn	own Dolph	in ULWH	Unk Large Wha	ile
		Risso's dol		PGW	Pacific Whale	Grey	CLT	CA Least	tern	PH	S	Ha	rbor Seal	СМ	O Comr	non Dolph	in UPIN	Unknown Pinn	iped
	PWS	Pac White-	sided Do	phin	***************************************														

Date: 1/14/23 Observer: PT

General Weather AM Cloudy 55

PM Cloudy 57 Daily Start Time: 8: 30 am

Daily End Time: 12: 30 pm

		# of	PM _ cla		Bear	Sex	Age Class	Dir. of Travel/	1 Beh	2 Beh	2 Beh Time	Buoy#	Activity Type	Resight? (Y/N)	Notes/Other Human Activity
Time	Species	Ind Water	# of Ind HO	Dist (ph)	Dear		Class	Census	-		11110			N	no in the act.
2100	(5)	1		50	181			SKE	SW					N	no in the act.
1:06	CSL	1		120	77.50.00.00.00.00			N	SW						
0:12	CSL	'		100	()										
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	Species Abbreviations				N. Fleebant Soal	GST	Green sea turtle	Mixed	Multiple Species	PWH	Pilot Whale
CSL	CA Sea Lion	CSL	Dead CSL	ELS	N. Elephant Seal	001	Oleen een tale		B. Labla	ULWH	Unk Large Whale
	C . I Di Delebia	SSL	Stellar Sea Lion	Unk	Unknown	Other	Other Species	UDOL	Unknown Dolphin		
CBD	Coastal B'nose Dolphin	33L	Stellar Gea Lion	27.22		nue	Harbor Seal	CMD	Common Dolphin	UPIN	Unknown Pinniped
RDO	Risso's dolphin	PGW	Pacific Grey Whale	CLT	CA Least tern	PHS	narbor Sear	CINID			
PWS	Pac White-sided Dolphin										

Date: 125 Observer: RT General Weather AM Synny 47 Daily Start Time: 7:30MM Daily End Time: 11,30 MM PM_SVMy,56 Dir, of Dist Resight? (Y/N) Species Ind # of Ind HO Age 2 Activity Bear (m) Sex Travel Beh Buoy# Notes/Other Human Activity Water Class Beh Beh Type Census Time 0:2V CSL 200 314 SW no in the work 0 2 3 4 5 6 7 8 9 0 **Species Abbreviations** Green sea CSL CA Sea Lion CSL Dead CSL N. Elephant Seal **GST** Mixed **Multiple Species** Pilot Whale **PWH** turtle Coastal B'nose Dolphin SSL Stellar Sea Lion Unk Unknown Other Other Species UDOL Unk Large Whale **Unknown Dolphin** ULWH RDO Risso's dolphin **PGW Pacific Grey** CA Least tern PHS Harbor Seal **Unknown Pinniped** CMD Common Dolphin UPIN Whale Pac White-sided Dolphin

USCG Los Angeles Wharf

20	022	December of	_			_		0.00000						Surface Water Visu	al Observ	ations			
Date	Time	Description of Work In Water Work Activity	Notes for Time Initiate Pile Installation	Pile	Pile No. or Location	Tide Level	% Cloud Cover	Weath Temp.	Visibility	Wind Speed & Direction	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	Sitt Curtain in Good Condition Y/N	Turbidity Notes/Actions Taken	Name of Observer
	644	pile		enstallation	1	4.19		140	han	(mph)	N	RIA	N	N	2	NIA	MA	N	P.J
6/29		driving	12:-27	7:13pm 3:30		4.47\$	2	108	high	100	A F	NA	N	N	N	NA	NA	N	PJ
76	12:27	CHINITE	pm	10:49	45	1.62		46	high	1-1-	N	_	2	7	2	NA	MIA	N	PJ
-	9:04	-	9:29	10.25	1	2.7	3	67	high		2	2	N	N	N	NIA	NA	N	PJ
111	6:30	pile dr.	12:330			5.0	5	70	1	200	2	N	2	N	2	MK	NIA	N	PJ
-		piledr.		4:00		3.9	W	74		umphe	2	N	2	7	1	NIA	MA	N	62
8/16/	_	piledr	3:30	9:38		1.0	15	67		umph	7	N	N	7	7	NIA	NA	N	PI
	11	2116	8:34	1:19		4.7	2	70		PC	7	N	N	N	7	NIA	MA	N	PJ
1.	16	111601		4:45		4.5	5	73	7	12mpn	7	N	N	7	N	NIK	NA	N	20
817	11	111001	3:20	9:47				70	nigh	SMPh	7	N	2	7	N	NA	MIA	N	PJ
			7:56	9:30		2.23	2	71	high	SMPH	N	7	N	N	7	MIR	NA	12	PJ
18 7		1 1	12:18	1:33		3.67	2	67	high	Theph	N		N	N	N	NIA	NITA	N	ELS
	- 11		0:49	11:17		3.29	2	71	high	10 - 00	N	N	N	N	N	NIA	NIA	N	ELS
to be 1	- 11	1	4:36	15:11			_	17		1 mph		,	1	N	N	NIA	NIA	N	ELS
	36 P		1.56	8:52			95	61	high	6 mgh	N	N	N	1	N	1	1	N	FLS
1361	56m PJ	e driving 11	:36	12:18		3.36	10	-	high	NE	N	N	N,	N	1	NIA	NA	-	-
23 65	Far fo	le driving	4:13	4:42	-	2.76	5	73	high	11 ME	N	N,	N	N	N	NA	NIA	N	ELS
23 6.5	AM 91	e daving	5:49	16:29		3.48	5	74		10 Meh	N	N	N	N	N	N/A	N/A	N	ELS
1.1	-	16 quine a	8:54	9:57	HUG.	3.99	95	69	high	5 Mgh	N	N	N	N	M	NA	NA	7	ELS
	M D		1.16	12:09		3.62	75	72	high	7 mph	N	N	N	N	N	N/A	NA	N	ELS
	AM DI			14:32		2.47	10	76	high	amph	N	N	N	N	N	NA	NA	10	ELS
2 11	-		5:48	16:04		1.81	5	76		amph	N	N	N	N	N	NA	NIA	N	ELS
	1.1		8:13	8:55	1	3.57	5	71	high	Imph	N	N	N	N	N	NIA	NA	N	ELS
-	1 21	1	V 1	9:08			#	108	high	emph	N	N	N	N	N	NA	- 11	N	PJ
20 7	am p	110 011 8	5:32	01.00	1	0 1 0	K	-0	110]	SE		10			1	1.//	111		117

USCG Los Angeles Wharf

2022 Description of Work Notes for Pile Installation Days Only							Weather			Surface Water Visual Observations								
Time	In Water Work Activity	Time Initiate Pile Installation	Time Complete Pile Installation	Plie 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	Name of Observer
Tam	audr.	10:55	11:51		267	0	75	high	emph	N	N	2	N	N	-	MA	MA	PT
7AIT	alaly	3:56	4:30		2.65	0	74	high		N	N	N	2	2	2	M	NIM	PU
7an	npiledr	100m	11.40		4.3	2	78	high	Imph	N	N	N	N	N	NA	N/K	NA	PJ
Tar	m piledy	8:24	9:45		4.6	80	74	high	6mpn	N	N	N	N	N	N	MA	MA	PJ
Tav	moiled	11.38	12:2	3	3.20	400	083		umph	N	N	N	2	~	NA	MA	NIK	PJ
	1	11:45	18216		3.07	100%	91		3-5mh	N	N	1	N	N	K/A	NA	N/A	MTW
2 8a	moisod				3.30	55%			imph	N	N	N	N	2	NA	NA	NIA	PT
1	1		on 4:30	2	2.15	100	, 81		11	N	N	N	N	N	NA	NIA	NA	PJ
-	1		1				72	high	3M Ph	N	N	N	N	N	NA	NA	NA	PJ
			2:09		5.37	50	77	high	No	N	N	2	7	7	NA	NA	NA	PJ
-	1 100		10:31	4	3.4		71	high			~	M	~	2	NA	NA	NA	PJ
1070	m piled	1.08	10:12	+	3.89	5	67	high	2mpn SW	N	2	٢.	2	N	MA	NA	NA	PT
-		6:11.	1 12:14	bm	3.3	95	73	high	5 Mph	N	2	H	2	7	, //	NIA	NA	RT
		110	83 0		3.58	5	75	high	, WE	1.	N	N	7	N	NA		N/A	PT
9 70	um piled 1	1.3:06			4.0	05	75	high	, ME	10	N	2	N	N	-	MA	NA	PJ
	mared	r. 7:47	HE.S	8	4.0	110	67	high			N	ч	N	N			-	PJ
20 70	1			-		-			NE		2	7	2	2			- 1	PJ
0 70	m pile dr	. 12:47	21:24	m	2.9	7 45	77	1	1 NE	1 2	N	N	7	1	1			PJ
-	1	-			2.8	50	7.50	high			N	12	N	N	NA		1	PJ
			12:20	1		1 3	-	-		4	-	-			-	1	112	PJ
1	1	8:58	10:01			-			1				1	-	-		(1)	195
1 .	Chiles		-	-	_		-	-	VV	-	_		1 1	1		4 .//	4 114	Y DT
	7am	Time In Water Work Tam piledy Time in Work Notes for Par Time in Work Notes for Par Tam piledr 10:55 7am piledr 3:56 7am piledr 10 am Tam piledr 8:24 Tam piledr 8:24 Tam piledr 8:34 2 Sam piledr 8:34 2 Sam piledr 8:34 3 Tam piledr 8:34 3 Tam piledr 9:23 4 Tam piledr 9:35 6 Tam piledr 10:13 8 Tam piledr 10:14 9 Tam piledr 10:13 8 Tam piledr 10:14 9 Tam piledr 10:14	Time In Water Work Time Initiated Complete Pole Installation Dr. 12 15 11:51 7 am piledy 3:56 4:30 7 am piledy 10 am 11:40 7 am piledy 8:34 9:18 2 8 am piledy 8:34 9:18 2 8 am piledy 8:34 9:18 2 7 am piledy 8:51 10:24 3 7 am piledy 9:08 10:13 9 7 am piledy 9:08 10:13 9 7 am piledy 11:48 2:24 9 7 am piledy 7:45 9 7 am piledy 7:45 9 7 am piledy 7:45 9 7 am piledy 10:41 10:41	Work Time In Water Work Activity Time Initiate Complete Pile Installation	Time In Water Work Time Initiate Pile Pile No. or Pile Installation Days Only Tam All dr. 10:55 11:51 Tam All dr. 10:55 11:51 Tam piledr 10 am 11:40 Tam piledr 8:24 9:45 Tam piledr 8:24 9:18 3.07 Tam piledr 8:34 9:18 3.07 Tam piledr 8:31 16:26 3.07 Tam piledr 8:51 16:26 3.57 Tam piledr 9:27 10:34 10:34 10:30 Tam piledr 9:37 10:34 3.41 10:34 10:45 10:	Time In Water Work Pie Installation Days Only Time In Water Work Activity I Time Installation Pie Installat	Time In Work Work Time Initiate Pile Tomplete Pile No. or Pile Installation Complete Pile Installation Pile No. or No. or Pile No. or Pile No. or Pile No. or No. or Pile No. or No. or Pile No. or Pile No. or	Time in Water Work Time Institute Complete Pile No. or Pile Institute Complete Pile No. or Pile Institute Complete Pile No. or Pile Institute Connection I S. D.	Time in Washer Work Primes Pri	Wood Notice to the Institution Days Only Weather Weather Time Institute Day Only Time Institute Day Only Day Only	Time In Water Work Probabilities Days Only Time In Water Work Probabilities Days Only Time In Water Work Probabilities Days Only The In Water Work Probabilities Days Only Tom PURI 1 10:55 1:51 2:57 2:58 2:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:59 2:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 1:51 2:57 1:50 75 high Speed a Particles Plan No. 1 10:55 75 high Speed a P	Window Work Time Installation Time In Window Work Time Installation Time In Window Work Time Installation Pia No. or Localition Localition Localition Pia No. or Visibility Speed & Protricts Materialis Speed & Protricts Materialis Speed & Protricts Materialis Constitution Pia No. or No. No.	Time in Washer Work Time Institution Days Coly Weather Work Time Institution Chapter Piace or Piace Institution Chapter Piace Institution Institution Chapter Institution Ins	Time In Water Work Probabilistics Dept Corp. The Invasion of the Institute Dept Probabilistics of Part In the Invasion Probabilistics of	Time In Water Water In Time Intelligent Completing Pile No. or No.	Word Word	The Water was become the installation by the complete of the confidence of the installation of the install	

USCG Los Angeles Wharf

20		Description of Work	Notes for Pi	le Installation D	lays Only			Weather	,					Surface Water Visu	al Observ				
Date	Time	In Water Work Activity	Time tritiate 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	Sit Curtain in Good Condition Y/N	Turbidity Notes/Actions Taken	Name of Observer
12/9	66.30	piedr.	7.48	9:301		6.1	10/0	46	high	4 SW	N	N	N	N	NA	NA	MA	MA	PT
		piudr				4.8	100	48	nigh	Omph	N	N	N	N	M		NA	NA	MS
No.	- KO	POWER														, I	. 4	Ila .	
15	7am	Piler	40:21	2:04		2.3	80	62	nigh	145W	N	~	N	N	M	NA	NA		MS
16	7:30	pilledr	1.04	2:30		1.0	O	59	nigh	YSE	N	N	N	N	N	マネ	NIA	N/A	PJ
10	Sam	piledr	7:56	8:10		5.0	100	58	nigh	13 NW	N	N	N	N	N	NH	NA	N/K	PT
14	Solm	pilldr	1:14pm	2:57pm	1	3.7	80	60	high	3 NE	N	N	N	2	M	NA	MIA	MIA	PT
114	8:30	pilldr	10:45	11:13		0.8	85	55	high	119E	N	N	N	N		NIA	NIA	NA	PT
		Pile dr		11:00		4.8	0	56	high	19E	N	N	N	N		NA	MA	NIK	DI
									,										
			2-4					- 1			-								
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Appendix D. Hydroacoustic Monitorir	ng 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 μ Pa). 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 μ Pa 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 (Leq). 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 μ Pa² 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 μ Pa. 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 μ Pa² 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 μ Pa. 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

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Item	Specifications	Quantity	Usage
RESON TC 4033Hydrophone	Receiving Sensitivity - $-203 \text{ dB} \pm 2 \text{ dB} \text{ re } 1 \text{ V/}\mu\text{Pa}$ at 250 Hz	3	Measures and records underwater sounds at mid-depth position. SLM both measures (in dB) and digitally records sounds for
Larson Davis 831C Sound Level Meter	Sampling Rate - 51.6 kHz	3	subsequent analysis
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:	Table 2: Daily Data Summary Sheet for Impact Pile Driving Activity August 23, 2022												
				Distance to	Dept	h (m)	Pea	ık (dB)		SEL (dl	3)	RN	AS (dB)
Time	Pile ID	Hammer Type	No. of Strikes	Pile from Hydrophone (m)	Water	Sensor	Max	Median	Max	Median	cSEL	Max	Median/ duration
				10	9	5	190	188	167	165	189.1	178	175/0.09s
						8	194	193	169	168	191.7	183	181/0.1s
08:32 to	Pile	Impact Hammer	251	30	9	5	184	180	161	159	182.9	168	166/0.22s
08:52	#46A	D-80	201		-	8	186	182	160	158	181.6	170	168/0.24s
				87	9	5	1	1	1	1	1	1	1
				0/	9	8	177	172	152	150	173.0	166	154/0.42s
				10	10	5	196	191	171	169	195.1	185	180/0.06s
		_		10	10	8	197	195	171	170	196.2	186	182/0.1s
11:17 to	Pile	Impact Hammer	462	23	10	5	188	185	163	162	188.4	177	171/0.13s
12:18	#46B	D-80			10	8	191	188	165	162	189.1	181	174/0.15s
				55	13	6	182	178	159	154	181.8	170	160/0.25s
					13	11	182	177	157	155	181.1	163	160/0.29s
				10	10	5	195	191	171	169	195.6	184	181/0.06s
				10	10	9	197	195	171	170	195.9	185	183/0.10s
14:13 to		Impact Hammer	439	30	10	5	187	183	165	160	186.9	186	168/0.16s
14:42	#48D	D-80	437	30	10	9	191	188	164	161	187.9	182	173/0.16s
						6	180	176	156	154	180.4	165	159/0.26s
				62	13	11	181	177	159	154	182.2	168	159/0.30s

Table 2:	Table 2: Daily Data Summary Sheet for Impact Pile Driving Activity August 23, 2022												
				Distance to	Dept	h (m)	Pea	ık (dB)		SEL (d)	B)	RN	AS (dB)
Time	Pile ID	Hammer Type	No. of Strikes	Pile from Hydrophone (m)	Water	Sensor	Max	Median	Max	Median	cSEL	Max	Median/ duration
				10	10	5	195	193	172	170	194.7	185	182/0.05s
				10	10	9	196	194	171	169	194.2	186	183/0.04s
16:04 to	48C		327	28	10	5	186	182	163	160	184.8	173	166/0.24s
16:30	400		321	28	10	9	189	187	164	162	187.0	180	174/0.14s
				60	13	6	177	174	154	151	175.5	166	157/0.26s
				00	13	11	181	177	158	155	180.0	172	166/0.10s
Ambient ² 14:45 to 15:15					8	5	172						125 Cont. Leq(80min)
June 29													

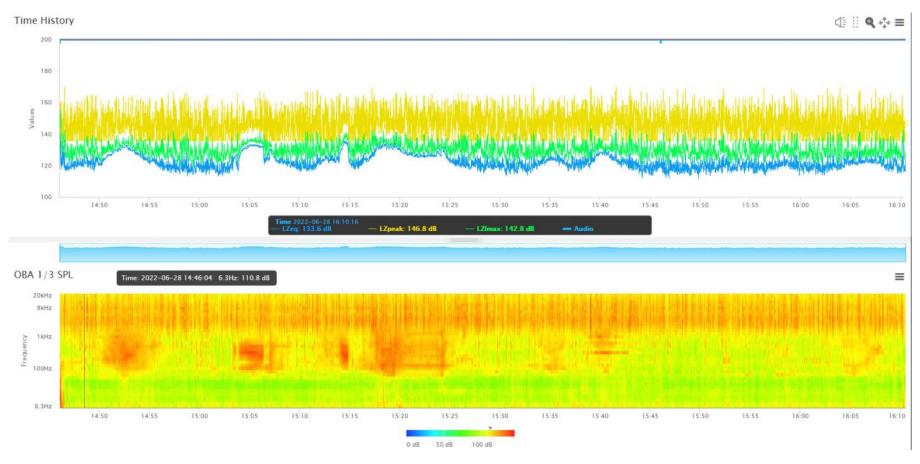
Notes:

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	185 dB cSEL	203 dB cSEL	160 dB RMS
	Fish	Phocid Pinniped	Otariid Pinniped	Behaivior
Test Pile #1, 46A, 46D,	30 m	27m	4m	
48, 48	Per pile	Per pile	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)

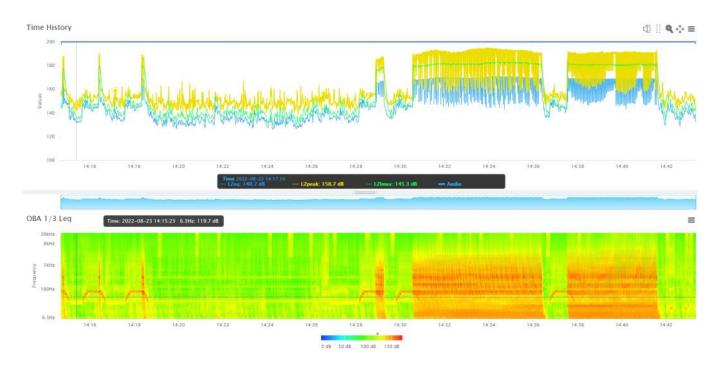
Pile 46A – 10m



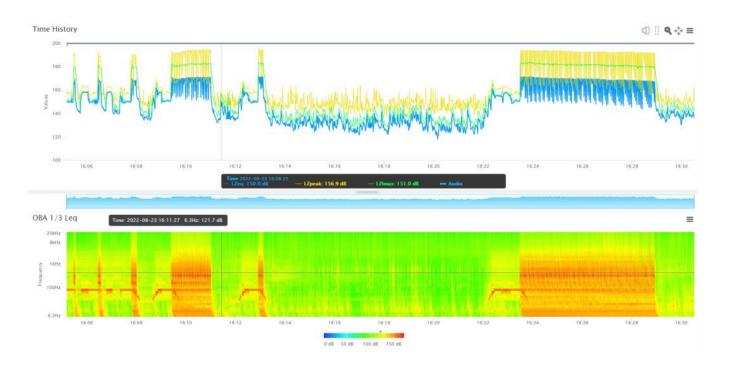
Pile 46D - 10m



Pile 48D - 10m

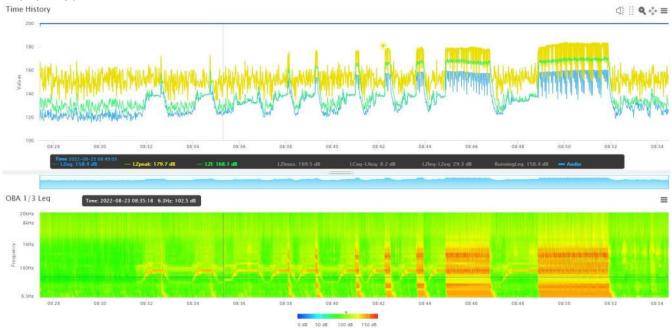


Pile 48C - 10m



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

Pile 46A - 30m



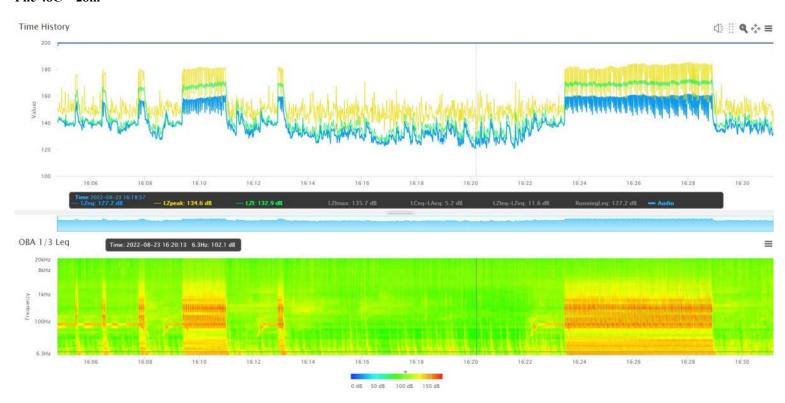
Pile 46D - 23m



Pile 48D - 30m

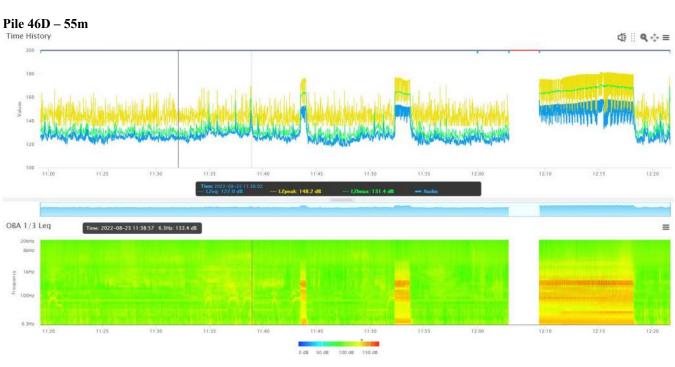


Pile 48C - 28m

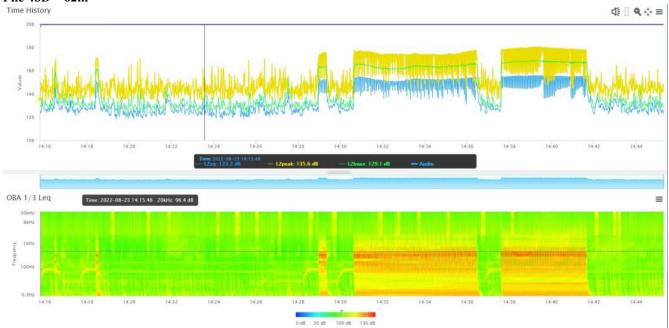


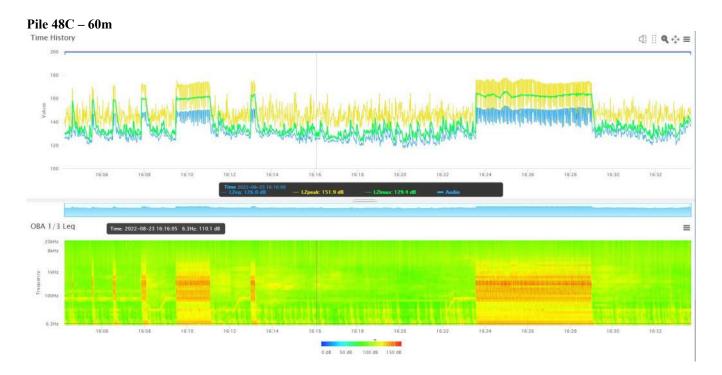
Measurements at 87, 55, 62 and 60 meters from Pile (mid depth)



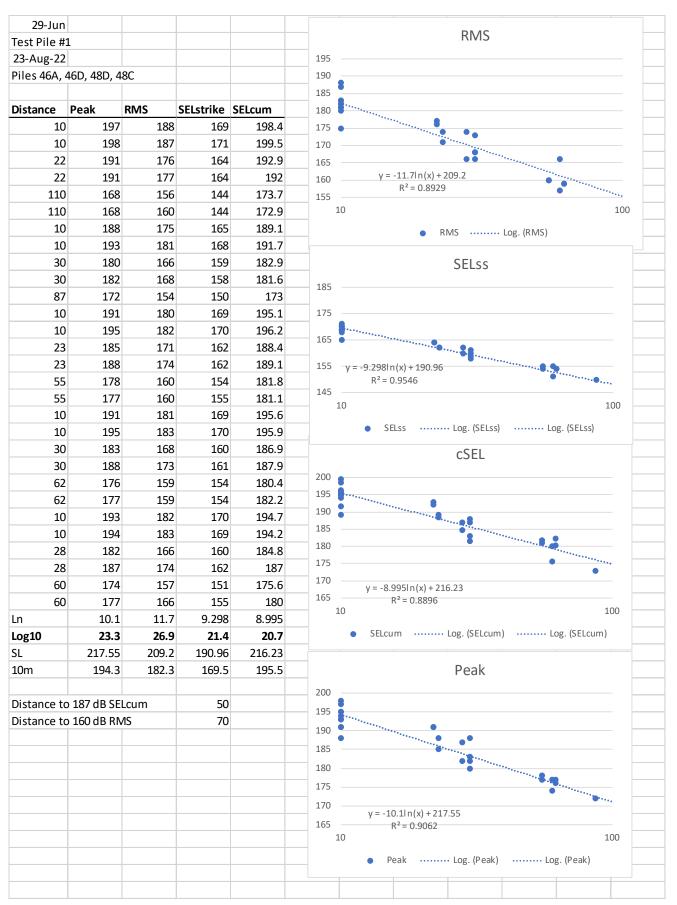


Pile 48D - 62m





Threshold Distance Calculations





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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 μ Pa). 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 μ Pa 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 μ Pa² 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 μ Pa. 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 μ Pa² 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 μ Pa. 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 Sensitivity203 dB $\pm $ 2 dB re 1 V/ μ Pa at 250 Hz	3	Measures and records underwater sounds at mid-depth position. SLM both measures (in dB) and digitally records sounds for			
Larson Davis 831C Sampling Rate - Sound Level Meter 51.6 kHz		3	subsequent analysis			
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

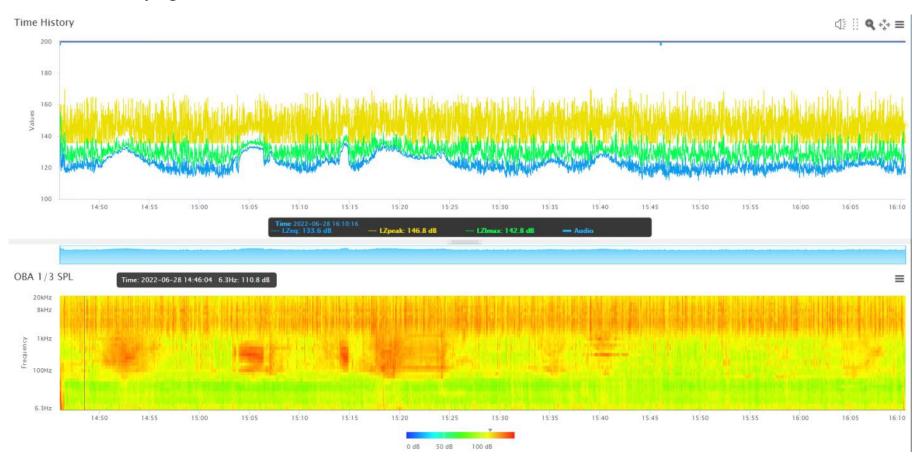
				Distance to	Dept	h (m)	Pea	k (dB)		SEL (d)	B)	RMS (dB)		
Tima	Pile ID	Hammer Type	No. of Strikes	Pile from Hydrophone (m)	Water	Sensor	Max	Median	Max	Median	cSEL	Max	Median/ Duration	
Part One	Post One	1.0	9	4	198	190	173	167	185	185	179 0.07sec			
07:47 – 07:50		Impact		10	9	8	194	188	172	166	184	184	177 0.15sec	
Part two	Fende r Pile	Hammer D-80	nmer 41	68	9	4	179	173	157	151	169	168	162 0.09sec	
08:18 – 08:19						8	175	156	153	143	163	164	152ª	
00.17					212	0	4	172	159	147	140	157 ^b	158	151a
			212	212 9	8	165	152	141	136	152 ^b	151	144 ^a		
Part One				10	0	4	191	190	170	167	184	181	180 0.06sec	
07:56 – 07:59		Impact		10	10	9	8	189	187	168	167	183	179	178 0.15sec
Part two	Fende r Pile	Hammer D-80	ner 44	68	9	4	174	171	153	152	168	164	162 0.09sec	
08:25 –		D-00				8	169	161	153	149	166	161	157ª	
08:27					0	4	169	157	141	138	155 ^b	151	150 ^a	
				212	9	8	150	147	136	133	150 ^b	145	141ª	
Ambient ^c 14:45 to 15:15 June 29					8	5	172						125 Cont. Leq(80m in)	

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.

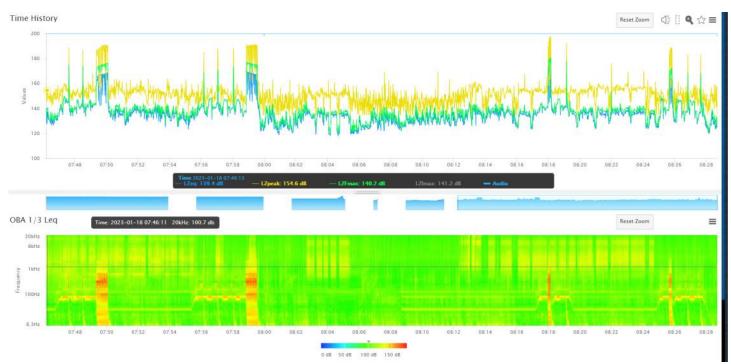
Table 3: Distance to Applicable Underwater Noise Thresholds Impact Pile Driving Activity

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

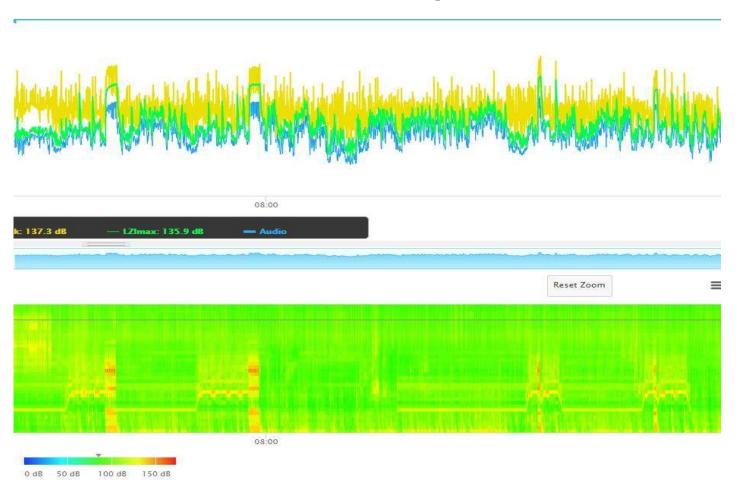
Attachment A - Ambient Measurement at 110 meters from construction on June 29, 2022. Note various vessel passages, with large vessels passing at 14:50-55 and 15:03-08, 15:15, and 15:17-25. A large container ship passed 137m at 14:05 and another at 155m at 15:15. Each were escorted by tug boats.



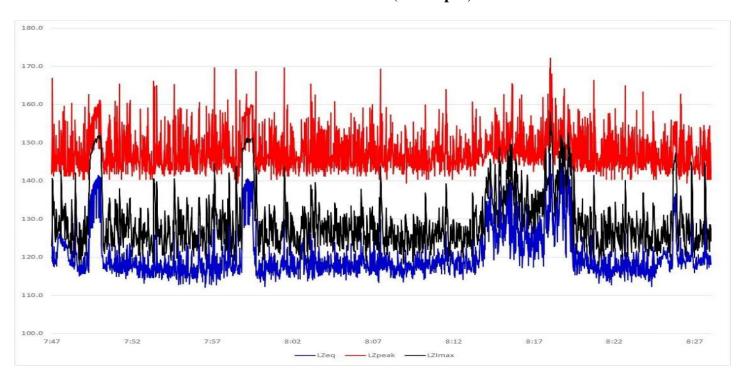
Attachment B - Measurements at 10 meters from Pile (mid depth)



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 RMS Composite piles 25-Jan-23 Piles A-I Peak SELstrike SELcum RMS Distance $y = -10.49 \ln(x) + 202.61$ $R^2 = 0.9362$ • RMS Log. (RMS) Log. (RMS) **SELss** y = -9.778ln(x) + 189.47 $R^2 = 0.9589$ • SELss ······ Log. (SELss) ····· Log. (SELss) cSEL $y = -9.897 \ln(x) + 207.19$ $R^2 = 0.9693$ Ln 9.526 10.49 9.77 9.897 SELcum Log. (SELcum) Log. (SELcum) Log10 21.9 24.2 22.5 22.8 SL 217.02 202.61 185.46 202.98 Peak 10m 195.1 178.5 163.0 180.2 Distance to 187 dB SELcum Distance to 160 dB RMS $y = -9.526 \ln(x) + 214.8$ $R^2 = 0.8185$

Peak ······ Log. (Peak) ····· Log. (Peak)

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

IMPACT PILE DRIVING REPORT PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN VERSION 1.2-Multi-Species: 2022 (if OTHER INFO or NOTES get cut-off, please include information elsewhere) USCG Construct OPC Homeport LA/LB Project PROJECT INFORMATION PEAK **RMS SELss** OTHER INFO two 24-inch concrete fender piles January 18, 2023 Single strike level (dB) 198 167 179 Distance associated with single strike 10 10 10 level (meters) 23 Transmission loss constant 2 **NOTES** Number of piles per day Number of strikes per pile 43 Number of strikes per day 86 Attenuation 0 Cumulative SEL at measured distance 186 RESULTANT ISOPLETHS **FISHES** (Range to Effects) **BEHAVIOR ONSET OF PHYSICAL INJURY** SEL_{cum} Isopleth Peak RMS Isopleth Isopleth Fish ≥ 2 g Fish < 2 g 182.3 **ISOPLETHS** (meters) 4.5 9.4 14.0 Fishes present Isopleth (feet) 14.7 45.9 598.2 **SEA TURTLES PTS ONSET** BEHAVIOR Peak Isopleth SEL_{cum} Isopleth RMS Isopleth **ISOPLETHS** (meters) 1.7 14.9 0.3 Sea Turtles present Isopleth (feet) 5.6 49.0 MARINE MAMMALS LF Cetacean **MF Cetaceans HF Cetaceans PW Pinniped OW Pinnipeds** PTS ONSET (Peak isopleth, meters) 1.2 0.4 0.3 6.7 1.4 PTS ONSET (Peak isopleth, feet) 4.0 1.3 22.0 4.4 1.1 PTS ONSET (SELcum 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. presentPhocids 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 μ Pa). 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 μ Pa 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 μ Pa² 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 μ Pa. 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 μ Pa² 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 μ Pa. 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 Sensitivity203 dB ± 2 dB re 1 V/μPa at 250 Hz	3	Measures and records underwater
Larson Davis 831C Sound Level Meter	Sampling Rate - 51.6 kHz	2	 sounds at mid-depth position. SLM both measures (in dB) and digitally records sounds for subsequent analysis.
Larson Davis 831C Sampling Rate - Sound Level Meter 51.6 kHz		1	
Autonomous Hydrophone/Audio Recorder Sampling rate- 48KHz Hydrophone Receiving Sensitivity180 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.

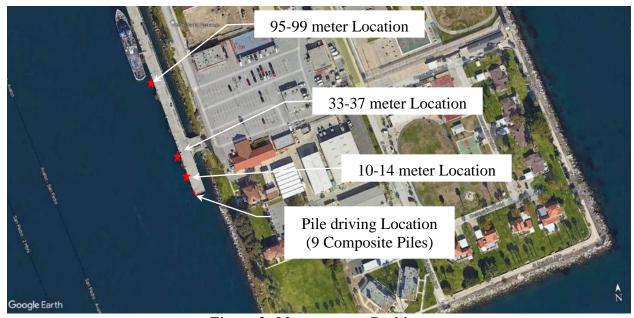


Figure 2: Measurement Positions

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

			Measured	- ` ′		Pea	k (dB)		SEL (dB	5)	RMS (dB)																					
Time	Pile ID	No. of Strikes	Distance to Pile (m)	Wate r	Sensor	Max	Median	Max	Median	cSEL	Max	Median	Duration																			
			10-14	8	4	194	188	166	162	189	179	174	0.0565																			
					7	A	A	167	164	191	179	176	A																			
10:14 -	Fender Piles A	442	4.42	440	4.40	4.42	4.42	4.40	440	4.40	4.42	4.42	4.42	4.42	440	442	442	442	442	442	4.42	22 27	o	4	186	181	160	155	182	173	168	0.0551
11:00	11:00 through I (9 Piles)		33-37	8	7	188	182	162	158	184	174	170	0.0612																			
																					05.00	8	4	174	169	148 ^B	143 ^B	170 ^B	161 ^C	156 ^C	D	
			95-99	95-99	95-99	95-99	95-99	95-99	93-99	95-99	95-99	95-99	95-99	95-99	95-99	95-99	95-99	95-99	95-99	95-99	8	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)																						

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

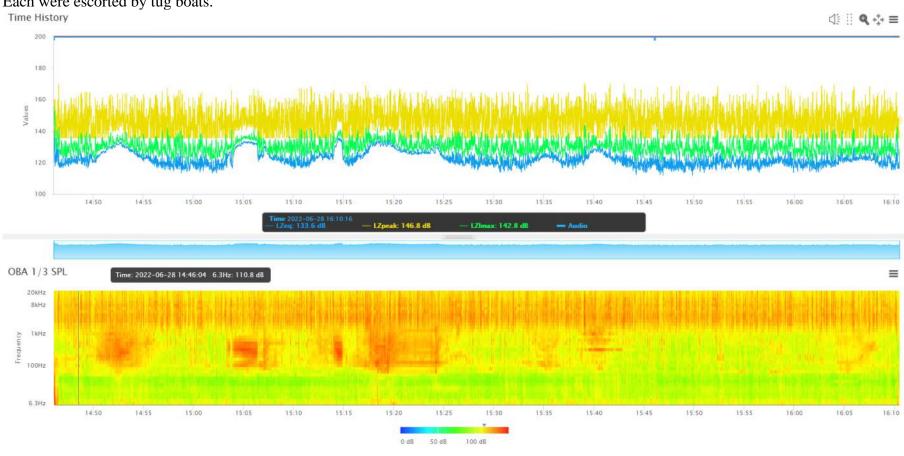
Pile	187 dB cSEL Fish	185 dB cSEL Phocid Pinniped	203 dB cSEL Otariid Pinniped	160 dB RMS Behavior
Fender piles	16	16	2	62

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.

^CEstimated based on impulse level measured by SLM

Autonomous unit failed to record

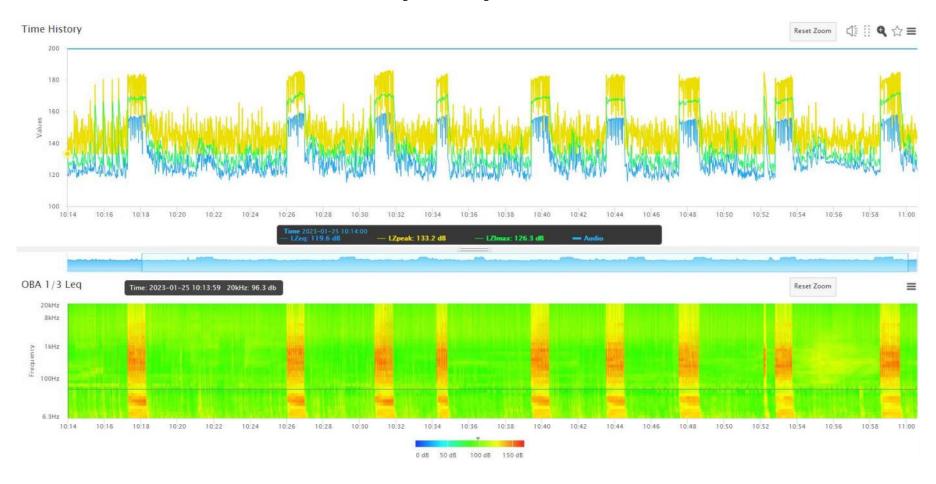
Attachment A - Ambient Measurement at 110 meters from construction on June 29, 2022. Note various vessel passages, with large vessels passing at 14:50-55 and 15:03-08, 15:15, and 15:17-25. A large container ship passed 137m at 14:05 and another at 155m at 15:15. Each were escorted by tug boats.



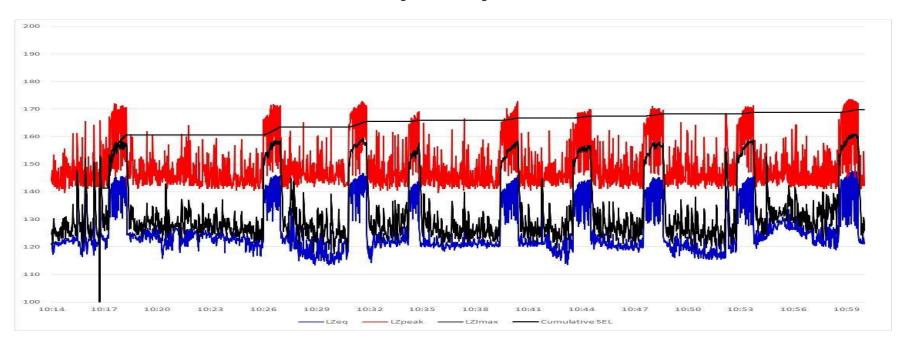
Attachment B - Measurements at 10 -14 meters from the pile (mid depth) Piles A - I



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 $\boldsymbol{A}-\boldsymbol{I}$



Attachment E - Threshold Distance Calculations

Composito	niles				RMS
Composite	piles				195
25-Jan-23					190
Piles A-I					185
D!-+	DI-	DNAC	CEI -4-:11	CE1	180
Distance	Peak	RMS	SELstrike		loop .
10	194	174		180	175 170
10	193	176		180	165
11	195	176		182	y = -8.569ln(x) + 196.62
12	194	175		178	R ² = 0.942
12	194	176			10 100
13	191	174		179	● RMSLog. (RMS)Log. (RMS)
13	189	172			Log. (NIVIS)
13	190				CELoo
14	191	174			SELss
33	184	168			185
33	186			174	y = -8.9ln(x) + 185.46
34	186	170	158	175	R ² = 0.9466
35	184	168	156	171	165
35	183	169	156	173	155
36	184	168	155	172	145
36	183	166	154	171	145 10 100
36	183	167	154	171	
37	185	168	156	174	SELss Log. (SELss) Log. (SELss)
95	172	156	144	161	
95	172	157	144	160	cSEL
96	173	157	144	161	185
97	169	154		156	94 0
98	173			159	• 8 The second s
98	170	155		159	175
99	171	156		160	y = -9.162ln(x) + 202.98 R ² = 0.9342
99	171	157		159	165
99	174	160		163	160
33		200	2.10	100	
					155 10 100
Ln	9.737	8.569	8.9	9.162	
Log10	22.4				SELcum Log. (SELcum) Log. (SELcum)
SL	217.02				
10m	194.6				Peak
LOITI	134.0	170.9	105.0	101.5	200
Distance to	197 AB CC	Loum	16		195
Distance to Distance to			62		190
pistance (C	TOO OR KI	ris	02		
					y = -9.737ln(x) + 217.02
					180
					170
					165
					10 100
					PeakLog. (Peak)Log. (Peak)
					Log. (I carr)

IMPACT PILE DRIVING REPORT PRINT IN LANDSCAPE TO CAPTURE ENTIRE SCREEN VERSION 1.2-Multi-Species: 2022 (if OTHER INFO or NOTES get cut-off, please include information elsewhere) 16-inch composite piles for the USCG Port of LA project 22-079 PROJECT INFORMATION PEAK **SELss** RMS OTHER INFO Nine 16-inch composite piles January 25, 2023 Single strike level (dB) 194 163 175 Distance associated with single strike 12 12 12 level (meters) Transmission loss constant 21 **NOTES** Number of piles per day 9 50 Number of strikes per pile Number of strikes per day 450 Attenuation Cumulative SEL at measured distance 190 RESULTANT ISOPLETHS **FISHES INJURY BEHAVIOR** (Range to Effects) **ONSET OF PHYSICAL** Peak SEL_{cum} Isopleth RMS Isopleth Isopleth Fish ≥ 2 g Fish < 2 g ISOPLETHS (meters) 3.2 15.8 24.6 Fishes present 186.1 Isopleth (feet) 10.6 52.0 80.6 610.4 **SEA TURTLES PTS ONSET BEHAVIOR** Peak Isopleth SEL_{cum} Isopleth RMS Isopleth **ISOPLETHS (meters)** Sea Turtles present 0.2 2.5 12.0 Isopleth (feet) 0.6 8.1 39.4 **MARINE MAMMALS HF Cetaceans PW Pinniped** LF Cetacean **MF Cetaceans OW Pinnipeds** PTS ONSET (Peak isopleth, meters) 8.0 0.2 5.0 0.9 0.2 PTS ONSET (Peak isopleth, feet) 2.5 8.0 16.4 0.6 2.8 PTS ONSET (SEL_{cum} isopleth, meters) 24.5 2.3 2.4 27.8 15.7 PTS ONSET (SEL_{cum} isopleth, feet) 80.5 7.4 91.2 51.5 7.9 ALL MM MF Cet. present HF Cet. presentPhocids present Otariids present Behavior (RMS isopleth, meters) 62.2 LF Cet. present Behavior (RMS isopleth, feet) 203.9