TECHNICAL MEMORANDUM

TO:	**Chad Curs, Bergerson Construction**
FROM:	Courtney Straight, Northwest Environmental Consulting, LLC
DATE:	December 24, 2020
SUBJECT:	**Marine Mammal Monitoring**
PROJECT:	USACE Columbia River King Pile Project

INTRODUCTION

This Memorandum summarizes marine mammal monitoring completed for the USACE Columbia River King Pile Project, as required per the monitoring and restrictions of pile driving operations shown in the King Pile Navigation Aids, Project Manual, Contract W9127N19C0038.

Marine Mammal monitoring was required to be performed during any pile driving activities at the project location in the Columbia River. Bergerson Construction retained Northwest Environmental Consulting to perform the required marine mammal monitoring. Monitoring occurred per the attached USACE Columbia River King Pile Project Marine Mammal Monitoring Plan (See Attachment A).

PILE DRIVING ACTIVITIES

Monitoring was conducted during pile driving activities between Monday, October 5th and Thursday, December 17th (see table below for details of monitoring/sightings). The monitoring was performed from the barge, work boat, or from shore at the best vantage point for each location. The Level B monitoring zone was established as the farthest distance visible using binoculars and the Level A monitoring zone was established using a range finder according to distances designated in the IHA.

A take was recorded for any marine mammals observed during pile driving in both zones or in the Level B take was recorded if a mammal was observed in the Level B monitoring zone during or a half hour before or after pile driving. It was assumed that the animal was still likely in the zone within the pre and post monitoring time period because of the size of the zone. It would be unlikely that a marine mammal would move out of the zone within 30 minutes if observed near the work site.

SUMMARY OF MONITORING ACTIVITIES

The marine mammal monitoring was done by Brad Thiele, Courtney Straight, Mary Powers, Kimberly Smith, and Joseph Vinarcsik (see Attachment B – Marine Observer Resumes). A total of 36 harbor seals and 9 Steller sea lions were observed in the Level B Take zone throughout the project. No marine mammals were observed within the Level A Take zone at any point during pile driving activities. The take values do not exceed the limits designated in the IHA. See Attachment C – Observation Summary Table for the complete daily summary.

Attachment A – Marine Mammal Monitoring Plan

Northwest
Environmental Consulting, LLC

600 North 36th Street, Suite 423
Seattle, Washington 98103
(206) 234-2520

MEMORANDUM

TO: Chad Curs, Bergerson Construction

FROM: Brad Thiele, Northwest Environmental Consulting, LLC

DATE: September 30, 2020

SUBJECT: **Marine Mammal Monitoring**

PROJECT: **USACE Columbia River King Pile Project**

INTRODUCTION

This Memorandum summarizes proposed marine mammal monitoring plans for the USACE Columbia River King Pile Project, as required per the monitoring and restrictions of pile driving operations shown in the King Pile Navigation Aids, Project Manual, Contract W9127N19C0038.

MONITORING PROTOCOL

Monitoring plans will follow the measures outlined in the King Pile Navigation Aids, Project Manual, Contract W9127N19C0038. A single monitor is proposed for daily monitoring. This monitor will have ample downtimes, between piles set up and driving, movement of the equipment between sites, and is not likely to have to observe for over 4 hours continuously during construction, if the 4 continuous hour monitoring limit is reached, the monitor will be given at least a 30 minute break before pile work continues. The monitor will observe from a designated safe area on the barge where lines of site over the water are best and may move around as necessary to observe as much area as possible.

A summary of key points is below.

General

- Implement soft-start procedures at the beginning of each day to provide warning and/or give animals in close proximity a chance to leave the area prior to impact driver operating at full capacity.
- Marine mammal observers meeting NMFS requirements are required 30 minutes prior to initiation of pile driving, during all pile driving installation/removal activities, and for 30 minutes post completion of pile driving.
- There must be at least one observer at each king pile marker installation site during all pile installation activities.
- Observers are required to work in shifts for a maximum of four hours with at least a one-hour break between shifts and may not perform observation duties for more than 12 hours in a 24-hour period. This means one observer is required to be on staff to facilitate marine mammal observation during all pile driving activities for the duration of the project.

Level B Take Authorization and Shutdown Zone Requirements

- Shutdown Zones as shown in the IHA must be adhered to (Attachment 1 – IHA). Operations must cease if any marine mammal comes within 10 meters of in-water construction equipment.
- Marine mammals in the Shutdown Zones will trigger cessation of pile driving work until either the animal has voluntarily left and is Visually confirmed beyond the Shutdown Zone, or 15 minutes have passed without re-detection of the animal.
- Marine mammals observed in the Level B disturbance area will be recorded as "take" and work will be allowed to proceed, with the exception of humpback whales, which will require shutdown of pile driving activities.
- If "take" is not authorized for a species detected in the Level B disturbance area, observer(s) will immediately notify the on-site supervisor or inspector, and require that pile driving either not initiate or temporarily cease until the animal has moved outside of the Level B disturbance area.
- Marine mammal Level B "take" is authorized up to the levels specified in the IHA. If a marine mammal is detected in the Level B disturbance area after cumulative Level B "take" has reached the authorized limits specified in the IHA for a given species, pile driving activities must cease and further pile driving must be halted until either the animal has voluntarily left and been visually confirmed beyond the Level B disturbance area, or the animal has not been re-detected in 15 minutes for pinnipeds or 30 minutes for cetaceans.
- If any other marine mammals (ESA-listed or no) enter the area, operations will cease as specified in the IHA.

Reporting

Submit all marine mammal observation sheets with recorded relevant information of any marine mammal sightings. Include cumulative "take" over all days of pile driving. Submit a draft report as stated in the IHA to the Government and Monitoring observations will be recorded on the proposed data sheets presented in Attachment 2 – Data Sheets. A daily summary sheet will be created for the final report.

Proposed Monitors

NWEC will use a single monitor during all pile driving, qualified to follow marine mammal monitoring protocol as noted above. A list of proposed monitors is included in Attachment 3 – Resumes.

Attachment C – Observation Summary Table

2020 Columbia River King Pile Project
Marine Mammal Monitoring
conducted by Northwest Environmental Consulting
for Bergerson Construction/USACE

	CUMULATIVE TAKES HS	SS	
LEVEL A	0	0	enter manually
LEVEL B	36	9	
TOTAL	36	9	be sure full length of columns are included in formulas

Date	Site/RM	Species[1]	Time[2]	Visibility[3]	Number	Distance[4]	Take (Y/N)[5]	Behavior/Construction Activity[6]
WEEK 1: Observer = B. Thiele								
10/5/2020	65/136.16	SS	14:13	E	1	100 W	N	Transient - not during obs window
10/5/2020	65/136.16							DON 15:01 DOFF 15:46
10/5/2020	65/136.16	SS	16:21	E	1	2500 E	N	Feeding - not during obs window
10/6/2020	64/134.16							DON 9:56 DOFF 10:12
10/6/2020	63/133.53							DON 13:15 DOFF 13:27
10/7/2020	60/118.38							DON 13:17 DOFF 14:15
10/7/2020	60/118.38	SS	15:12	E	1	100 W	N	between pile locations milling - last observed 15:40
10/7/2020	58/117.60							DON 16:21 DOFF 17:40
10/7/2020	58/ n/a							stab pile for safety DON/DOFF 18:00
10/8/2020	58/ n/a							remove stored pile DON/DOFF 7:54
10/8/2020	58/117.60							DON 8:50 DOFF 9:22
10/8/2020	59/117.72							DON 11:50 DOFF 14:44
10/8/2020	59/117.72	HS	11:01	G	1	50 NNE	Y	Milling - last observed at 11:22 - was likely still in 5km zone; PRE
10/9/2020	60/118.38							DON 8:00 DOFF 8:28
10/9/2020	60/118.38	SS	8:34	E	1	300 NNE	Y	Moving down main channel after pile driving; POST
10/9/2020	57/114.23							DON 12:23 DOFF 12:47
WEEK 2: Observer = M. Wainstein								
10/12/2020	56/109.83	SS	7:55	G	1	2000 W	N	transiting; crew heading to 1st pile, long before obs window
10/12/2020	56/109.83							DON 9:53 DOFF 10:09
10/12/2020	53/105.44							DON 13:01 DOFF 13:15
10/12/2020	52/102.66							DON 16:01 DOFF 16:23
10/13/2020	51/101.42							DON 9:33 DOFF 10:51
10/13/2020	50/99.14							DON 13:08 DOFF 13:38
10/13/2020	50/99.14	HS	12:53-13:03	M	1	600 NNW - 800 SSE	Y	milling, transiting; PRE

10/13/2020	49/97.75							DON 15:40 DOFF 15:52
10/13/2020	49/97.75	HS	14:40-15:15	G	1	1000 S - 800 N	Y	milling, transiting; PRE
10/14/2020	48/96.90							DON 8:12 DOFF 8:22
10/14/2020	47/96.21							DON 9:47 DOFF 9:55
10/14/2020	46/95.25							DON 11:51 DOFF 12:20
10/14/2020	46/95.25	HS	11:40-12:07	G	1	400 NW - 1000 SW	Y	milling; PRE-DON
10/14/2020	46/95.25	SS	12:33	G	1	300 S	Y	transiting; POST
10/14/2020	45/92.53							DON 14:28 DOFF 15:15
10/15/2020	44/91.62							DON 9:02 DOFF 9:13 Visibility = poor (fog). PRE-obs = boat run 1-2 km up/down river + directly across to far bank. No sightings. Back on barge for DON. POST-obs visibility had cleared to moderate.
10/15/2020	43/91.13							DON 11:38 DOFF 12:43
10/15/2020	42/90.25							DON 14:13 DOFF 14:51
10/16/2020	41/86.37							DON 7:58 DOFF 9:28
10/16/2020	41/86.37	HS	7:39+	G	1	250-1000 SSE	Y	milling, feeding; very likely same HS sighted frequently throughout PRE/DON/POST
10/16/2020	41/86.37	HS	9:41	G	1	500 NNW	Y	confirmed separate individual, milling; POST
10/16/2020	41/86.37	HS	9:43	G	1	200 SSW	Y	confirmed separate individual, feeding; POST
10/16/2020	41/86.37	HS	9:52	G	1	700 NNW	Y	confirmed separate individual, milling; POST
10/16/2020	40/85.93							DONa 10:46 DOFFa 11:36 DONb 12:14 DOFFb 12:59
10/16/2020	40/85.93	SS	10:25	G	1	300 W	Y	transiting; PRE
10/16/2020	40/85.93	HS	10:36	G	2	250 W	Y	milling; PRE
10/16/2020	40/85.93	HS	10:50	G	1	300 SSW	Y	transiting, likely separate from earlier pair; DON
10/16/2020	40/85.93	HS	12:47-13:20	G	1	300 SSW - 600 S	Y	milling, possible separate from earlier sightings; DON-POST
10/16/2020	40/85.93	HS	13:27	G	1	800 NWW	Y	milling, very likely separate from 13:20 sighting; POST
WEEK 3: Observer = M. Wainstein								
10/19/2020	39/85.59							DON 15:29 DOFF 17:01

10/19/2020	39/85.59	HS	14:48-17:00	E	1	400 S - 600 SSE	Y	milling, sighted frequently throughout; PRE-DON
10/20/2020	(continued)							DON 7:40 DOFF 10:04 (on/off intermittently as pile was moved, modified, etc)
10/20/2020	39/85.59	HS	7:16-7:28	G	1	70-150 S	Y	milling; PRE
10/20/2020	39/85.59	HS	9:46-10:10	G	1	400-600 SSW	Y	milling; DON-POST
10/20/2020	39/85.59	HS	10:04-10:33	G	1	SSW	Y	milling; DON-POST
10/20/2020	38/85.41							DON 11:46 DOFF 12:17
10/20/2020	37B/85.32							DON 13:32 DOFF 13:46
10/20/2020	37A/85.32							DON 15:32 DOFF 16:02
10/21/2020	36/82.58							DONa 8:42 DOFFa 8:53 DONb 9:15 DOFFb 9:56
10/21/2020	36/82.58	SS	7:56-8:02	G	1	1000-1200 SSE	N	feeding; before observation window
10/21/2020	36/82.58	HS	7:58-9:12	G	1	300 N -1600 SSE	Y	milling; PRE-DON
10/21/2020	35/82.32							DON 11:40 DOFF 14:01
10/21/2020	35/82.32	HS	11:27	G	1	400 NNE	Y	milling; PRE
10/21/2020	34/81.69							DON 16:11 DOFF 17:28
10/21/2020	34/81.69	HS	15:20-15:45	P*	1	500 W - 800 NNW	Y	feeding; PRE *beaufort 2/3 - limited detection capability
10/22/2020	33/81.23							DON 9:29 DOFF 10:11
10/22/2020	33/81.23	HS	9:17	B-P*	1	2000 NNW	Y	milling; PRE *light fog on water limiting visibility, animal sighted during boat ride to scan area for PRE-obs
10/22/2020	33/81.23	SS	10:00	B*	1	300 W	Y	*light fog on water limited visibility; DON
10/22/2020	32/79.35							DONa 12:27 DOFFa 12:37 DONb 12:51 DOFFb 13:24
10/22/2020	32/79.35	HS	12:05-12:40	G	1	250 SE - 500 SSE	Y	milling; PRE-DON
10/22/2020	31/77.48							DON 15:59 DOFF 16:30
10/22/2020	31/77.48	UP	16:50	G	1	3000 SSE	Y NOTE: not included in cumulative takes tally above	feeding; POST conducted partially from skiff on return to dock - brief sighting of pinniped and gull flock as we passed
10/23/2020	30/77.26							DON 10:14 DOFF 10:43
10/23/2020	29/76.86							DON 12:52 DOFF 15:00 beaufort 2/3 - visibility poor
WEEK 4: Observer = C. Straight								
10/26/2020	28A/76.16							DON 9:36 DOFF 10:24
10/26/2020	28B/75.46	HS	9:56-10:02	G	1	200 SSW	Y	milling; DON

10/26/2020	28B/75.46							DON 12:28 DOFF 13:07
10/26/2020	27/75.63							DON 15:30 DOFF 16:50
10/27/2020	27/75.63							DON 8:04 DOFF 10:09
10/27/2020	26/75.45							DON 10:52 DOFF 11:43 DON 12:23 DOFF 13:03
10/27/2020	25/75.35							DON 13:45 DOFF 14:53 DON 15:22 DOFF 15:34
10/27/2020	24/75.27							DON 16:33 DOFF 17:06
10/28/2020	23/71.87							DON 10:02 DOFF 10:28
10/28/2020	23/71.87	SS	10:29-10:30	P*	1	250 NNW	Y	transit (upstream); POST; *fog on water limiting visibility
10/28/2020	22/71.17							DON 12:14 DOFF 13:59
10/28/2020	22/71.17	SS	13:20-13:22	G	1	150 ESE	Y	transit (upstream); DON
10/28/2020	22/71.17	HS	14:20-14:21	G	1	300 ESE	Y	milling; POST
10/29/2020	21/64.88							DON 8:29 DOFF 10:14
10/29/2020	21/64.88	HS	8:56-8:58	M	1	400 NNW	Y	transit (downstream); DON
10/29/2020	20/64.06							DON 12:48 DOFF 13:59
10/29/2020	20/64.06	HS	13:02-13:03	E	1	450 NW	Y	milling; DON
10/29/2020	18/62.59							DON 15:56 DOFF 17:06
10/29/2020	18/62.59	SS	15:29-15:32	E	1	1 km NE	Y	transit (upstream); PRE
10/29/2020	18/62.59	HS	15:36-16:20	E	1	600 NE	Y	feeding; PRE-DON
10/29/2020	18/62.59	HS	16:25-17:26	E	1	700 SSW	Y	feeding; DON-POST
10/30/2020	18/62.59							DON 8:09 DOFF 9:40
10/30/2020	18/62.59	HS	9:19	G	1	50 SSW	Y	transit (downstream); DON
10/30/2020	18/62.59	SS	9:54	G	1	400 SSW	Y	transit (downstream); POST
10/30/2020	18/62.59	HS	10:10-10:14	E	1	300 SW	Y	milling; POST
10/30/2020	19/62.91							DON 11:48 DOFF 13:17
10/30/2020	19/62.91	HS	10:35-11:18	E	1	350 SSW	Y	milling; PRE
10/30/2020	19/62.91	HS	11:29-12:04	E	1	1 km SE	Y	milling; PRE-DON
10/30/2020	19/62.91	HS	13:33	E	1	500 SSE	Y	milling; POST
WEEK 5: Observers M. Powers, K. Smith, J. Vinarcsik								
11/2/2020	17/61.54			B			N	DON 9:06 DOFF 9:31
11/2/2020	16/60.80			M			N	DON 11:25 DOFF 12:21

11/2/2020	15/60.51			E			N	DON 13:58 14:46, hammer removed to cool off, bottom of pile cut off (point end removed), brief crew break. PSO on watch for mammals during break.15:30 recommenced pile driving DOFF 15:28
11/3/2020	14/57.95			E			N	DON 8:19 DOFF 8:37
11/3/2020	12/57.19			P			N	DON 10:05 DOFF 11:10
11/3/2020	13/57.32			M			N	DON 12:56 DOFF 13:34
11/4/2020	10/51.10			M			N	DON 8:12 crew break 8:39-8:50 DOFF 9:40
11/4/2020	11/51.39			E			N	PRE 10:44, crew break 11:00, PSO watch continued. DON 11:48, pile installation incomplete. Headed in at 4:05
11/5/2020	11/51.39	HS	7:10	E	1	100 SSE	N	Before observation window, transit (upstream), seen during safety orientation
11/5/2020	11/51.39						N	DON 10:18 DOFF 15:55 POSTSeveral crew breaks throughout day and lunch to due difficulties driving pile. Switched several times between impact and vibratory driver
11/6/2020	9B/50.16	HS	10:37-10:46 AM	E	1	100 SW	Y	milling, DON 09:25 DOFF10:27
11/6/2020	9B/50.16	HS	11:16	E	1	50 N	N	milling, sighted after post drill break, prior to lunch
11/6/2020	9A/50.16	HS	12:08-12:26	E	1	30 SSE	Y	milling, sighted during pre drill period; PRE 11:56 DON 12:26 DOFF 13:20 POST 13:50
11/6/2020	9A/50.16	HS	14:20-14:31	E	3	70 N	N	transit, 3 seals moving upstream in close succession (50 M apart)
11/6/2020	9A/50.16	HS	15:10	E	1	30 NW	N	milling, at next piling site (8)
Week 6 Observer: M.E. Powers								
11/9/2020	8/46.06			B				07:30 begin PRE-watch. patchy fog, visibility 20-40m, wind 10-15 knots E/SE
11/9/2020	8/46.06			B				DON=08:58 DOFF=09:29
11/9/2020	7/45.28	HS	10:35	P	1	25 E	N	Looking, Feeding, traveling East. Opportunisting sighting Before Pre-watch
11/9/2020	7/45.28	HS	10:49	M	2	40 E	N	Socializing, feeding opportunisitic sighting before Pre-watch
11/9/2020	7/45.28	HS	11:10	M	1	30 S	Y	PRE 11:00 traveling south
11/9/2020	7/45.28			G				DON 11:30 DOF 11:41
11/9/2020	6/44.24			G				DON=13:16 DOFF=13:40
11/9/2020	4/42.93			G				DON=15:35 DOFF=15:58

11/10/2020	5/43.17							Arrive on Site at 07:00. Moderate visibility. heavy rain, partly sunny with severe glare. E wind 5 knots. 4 river Otters opportunisticaly sighted traveling upriver.
11/10/2020	5/43.17							DON=08:37 DOFF=09:09
11/10/2020	3/41.99							DON=10:31 DOFF= 11:50 crew break. wind switched from west, heavy squall during transit
11/10/2020	1/41.51							DON=13:53 DOFF=14:51 Heavy rain, gust 20+ knots
11/10/2020	2/41.65	HS	15:30	m	1	35 S	N	Seal traveling upriver. Opportunistic sighting on transit to site 2.
11/11/2020	2/41.65							DON=08:43 DOFF=09:01
11/12/2020	24/75.27							11:18 Barge in place on site. Overcast. Cold East wind 14-17knots.
11/12/2020	24/75.27							12:00 vibratory DON to remove pling. 12:04 DOFF. piling removed. Viratory DON 12:09 DOFF 12:30.
11/12/2020	24/75.27							12:40 Adjusting barge position. Switching to Impact driver. 13:00 Bubble curtain lowered.
11/12/2020	24/75.27							13:30 impact driver Soft start. 13:32 DON 13:34 DOFF 13:46 DON 13:50 DOFF
11/12/2020	24/75.27							15:08 Spuds up to reposition to site #25
11/12/2020	25/75.35							15:27 Spuds Down/Barge in position. End of watch.
11/13/2020	25/75.35							Barge in place on site. Rain and wind (gusts 5-10 knots), overcast with clear visibility
11/13/2020	25/75.35							Vibratory driver: PRE 07:04 DON 07:34 DOFF 07:43 DON 07:52 DOFF 08:14 DON 08:23 DOFF 08:28 DON 08:50 DOFF 08:55
11/13/2020	25/75.35							Spuds up 10:09, spuds down in next location 10:21
11/13/2020	26/75.45							10:30 Light rain, wind (5-10 knots), mostly cloudy, mostly good visibility, frequent squalls with light to heavy rain (wind 10-15 knots)
11/13/2020	26/75.45							Switched to impact driver PRE 10:44 SOFT START 11:14 DON 11:20 DOFF 11:25 POST 11:55
11/13/2020	26/75.45							Spuds up 12:25, spuds down in next location 12:36
11/13/2020	27/75.65							Lowered bubble harness 12:45, Partly cloudy and clear with infrequent squalls, light wind (5-10 knots)
11/13/2020	27/75.65							Impact driver: PRE 12:45 DON 13:16 DOFF 13:18, swithched to vibratory driver DON 13:43 DOFF 14:08 POST 14:38

11/13/2020	27/75.65							Crew switched to non-drilling related work, end of watch 14:45
Observer: M.E.Powers								**Sunny Partly cloudy. Wind S/SW 10knots**
11/19/2020	55/109.7							08:00 crew on Barge. MMO standing watch from beach 350 m from zone A.
11/19/2020	55/109.7							08:50 Barge in postion at site 55
11/19/2020	55/109.7							Softstart 09:20 DON @ 09:40 DOFF @ 09:52
11/19/2020	55/109.7							Push tug affected by engine failure
11/19/2020	55/109.7							11:45 Spuds up
11/19/2020	54/109.2							12:10 Spuds down at site 54
11/19/2020	54/109.2							Rain. DON 12:39 DOFF 13:10
11/19/2020	54/109.2							End of Watch 13:40
Observer: Brad Thiele								**Mostly Cloudy, light wind**
12/17/2020	61/124.7			G				PRE 11:55 from shore, on barge 12:38
12/17/2020	61/124.7	SS	12:40	G	1	200 W	Y	DON 1:10, DOFF 2:37, End POST 3:07

[1] HS Harbor seal; CS California sea lion; SS Steller sea lion; UP unidentified pinniped

[2] Military Time

[3] B Bad (<0.5km); P Poor (0.5 - 1.5km); M Moderate (1.5 - 10km); G Good (10 - 15km); E Excellent (>15km)

[4] Direction (12 points of wind rose) and estimated distance in meters from pile

[5] Take within 10m of pile = Level A; > 10m to 5,420m = Level B; animals sighted during PRE/POST considered close enough for take during pile driving activity

[6] DON Driver on; DOFF Driver off; PRE Pre-watch (30 min before DON); POST Post-watch (30 min after DOFF)