6720 South Macadam Avenue, Suite 300
Portland, Oregon 97219
503.670.1108

ANCHOR QEA

Weekly Summary Report

Project Name:	Gasco Sediments Site ISS Field Pilot Study		
Project No:	000029-02.85	**Report Date:**	October 10, 2023
Week of:	October 2, 2023	**Report No:**	4

Weekly Summary

Item	Approximate Production This Week	Approximate Total Cumulative Production	Approximate Task Percent Completion
Mobilization activities	NA	NA	100%
Dolphin pile removal	0	0	100%
Debris removal	0	0	100%
ISS auguring	13 columns	29 columns	100%
Swell material removal	0	0	0%

Work Performed This Period

Monday (10/02/2023)

Performed in situ stabilization and solidification (ISS) auguring and ISS quality assurance/quality control (QA/QC) sample collection at columns 3-1, 3-2, 6-1, 6-2, and 6-3. Refusal was encountered at column 3-1.

Tuesday (10/03/2023)

Conducted bathymetric progress survey. Performed ISS auguring and ISS QA/QC sample collection at columns 6-9, 6-10, 7-1, 7-2, and 7-3.

Wednesday (10/04/2023)

Performed ISS auguring and ISS QA/QC sample collection at columns 7-9, 7-10, and 7-11.

Thursday (10/05/2023)

Reconfigured the drill pipe on the ISS drill rig to facilitate drilling at deeper water depths. Performed general housekeeping and equipment maintenance duties.

Friday (10/06/2023)

No work was performed.

Saturday (10/07/2023)

No work was performed.

Water Quality Monitoring

Monday (10/02/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring, and no turbidity plumes, sheens, or odors were observed. Four rounds of ebb tide water quality monitoring were performed during ISS auguring activities, with field parameters collected. Performed visual inspection of river inside the containment booms and identified sheen that was generated from a known ebullition area that is not associated with construction activities.

Tuesday (10/03/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring. During the last circuit of water quality monitoring, a minor sheen was observed to be present directly adjacent and outside of the construction containment boom. The sheen appeared related to a large vessel moving through the navigation channel that crested waves over the construction containment booms. One round of water quality monitoring was performed during flood tide during ISS auguring activities, with field and chemical parameters collected at background station NWN-BG1N and compliance station NWN-CS2S. Three rounds of ebb tide and one round of flood tide water quality monitoring were performed during ISS auguring activities with field parameters collected. Performed visual inspection of river inside the containment booms and identified sheen that was generated from a known ebullition area that is not associated with construction activities.

Wednesday (10/04/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring, and no turbidity plumes, sheens, or odors were observed. Three rounds of ebb tide and one round of flood tide water quality monitoring were performed during ISS auguring activities with field chemical parameters collected. Chemical parameters were collected at background stations NWN-BG1S and NWN-CS2N. Performed visual inspection of river inside the containment booms and identified sheen that was generated from a known ebullition area that is not associated with construction activities.

Thursday (10/05/2023)

Performed visual inspection of river outside the outer containment, and no turbidity plumes, sheens, or odors were observed. Performed visual inspection of river inside the containment booms and identified sheen that was generated from a known ebullition area that is not associated with construction activities. No water quality monitoring was performed.

Friday (10/06/2023)

No work was performed.

Saturday (10/07/2023)

No work was performed.

Findings:

There was an exceedance of two field parameters at compliance station CS-2N at a single depth during a single monitoring round on Tuesday, October 3, 2023. The readings were collected during the advancement of the last ISS column of the day. Turbidity was measured at 7.76 nephelometric turbidity units (NTU), which is only 0.35 NTU above the standard (based on 5 NTU over background, which was 2.41 NTU). The pH reading was 9.39, slightly above the standard of 8.5. Exceedances were identified in the bottom sample interval only, with no exceedances in the middle or top sample intervals. As discussed with and verbally confirmed by the U.S. Environmental Protection Agency (EPA), the Design Team is implementing the following best management practice refinements:

1. Maintain the moon pool curtain perimeter target depth no higher than 2 feet above mudline while preventing the curtain from contacting the mudline.
2. Alter the downstroke and upstroke grout injection from 80% down and 20% up to a lower downstroke injection (e.g., 70% down and 30% up).

A compilation of water quality daily field forms from the week (Attachments 1 through 4) and tabulated field parameter data (Attachment 5) are attached.

For Informational Purposes Only
In accordance with EPA's comments on the EPA-approved *Final Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan*,[1] for informational purposes only, pH and temperature samples were collected from the moon pool prior to initiation of ISS auguring and following completion of ISS auguring and prior to raising the moon pool curtain. These informational moon pool sampling results are included in Attachment 6.

Scheduled Construction Work This Week (Next Reporting Week)
Continue ISS auguring operations, ISS QA/QC sample collection, and swell material surveying, removal (if applicable), and tracking.

Problems Encountered and Contingency Actions Implemented
Due to the presence of encountered subsurface debris during ISS auguring at column 3-1, ISS treatment was extended to 26 feet below mudline, 4 feet short of the target 30-foot depth. On October 4, 2023, Apex Laboratories informed NW Natural that they would be unable to meet the turnaround time for the samples that were collected on October 3, 2023, and October 4, 2023, due to a staffing issue involving COVID-19 sickness. Therefore, the results for both days will be delayed until Tuesday, October 10, 2023. Results will be tabulated and included in Weekly Summary Report No. 5. In accordance with the Work Plan, EPA was notified of this extended turnaround time that is beyond the control of NW Natural.

Prepared by:	Kendra Skellenger	**Contact Information:**	503-752-4218 kskellenger@anchorqea.com
cc:	Bob Wyatt, Patty Dost, Mike Crystal, Tim Donegan, Taylor Crystal, Gary Rose, Joe Burke, Rob Ede, Jen Mott, Ryan Barth, Tim Stone, Ben Uhl, Billie-Jo Gauley, Joe Smith, Ross Pickering, Louisa Orr, Elizabeth Greene		

[1] Anchor QEA, LLC, 2023. *Final Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan*. Gasco Sediments Project Area. Prepared for U.S. Environmental Protection Agency, Region 10. September 12, 2023.

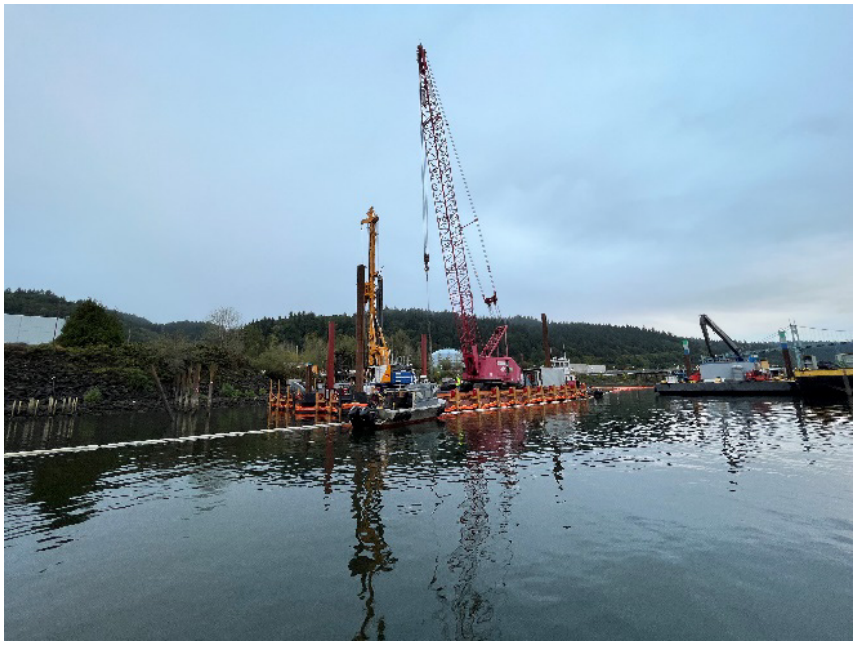
Attachments:	Attachment 1	Daily Monitoring Logs
	Attachment 2	Water Quality Monitoring Calibration Log
	Attachment 3	Water Quality Monitoring Forms – Field Parameters
	Attachment 4	Water Quality Sampling Forms – Chemical Parameters
	Attachment 5	Water Quality Field Parameter Measurements
	Attachment 6	Moon Pool Informational Measurements

Photographs

Photograph 1

Performing ISS auguring at column 3-2 (10/02/2023).

Photograph 2

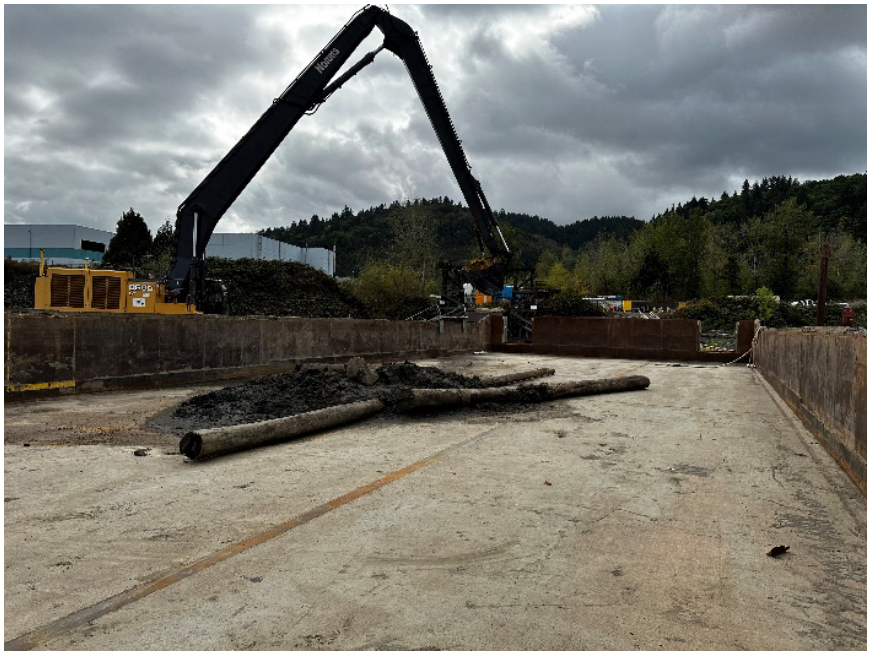


View of containment booms along south perimeter of the Field Pilot Study area (10/03/2023).

Photograph 3

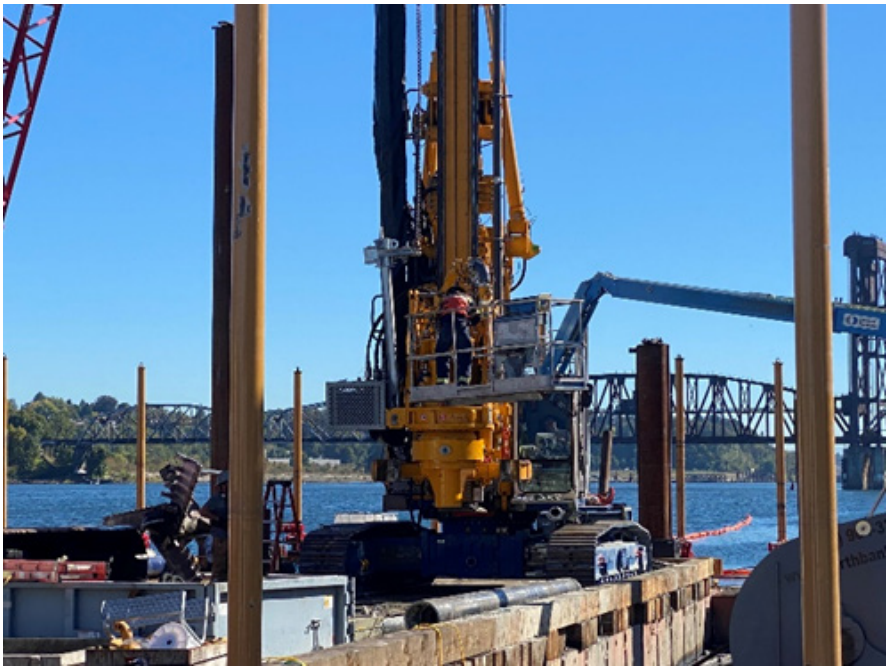
Performing ISS auguring at column 7-9 (10/04/2023).

Photograph 4



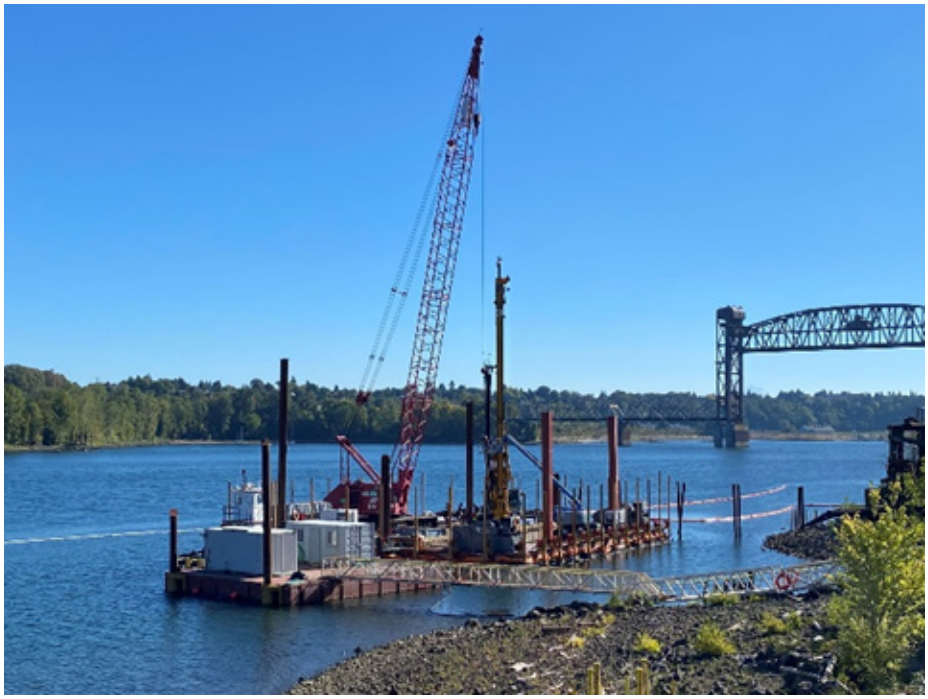
Swell material removal barge No. 7 prior to swell material removal at columns 1-4 and 1-9 (10/04/2023).

Photograph 5



Reconfigured the drill pipe on ISS drill rig to facilitate drilling at deeper water depths (10/05/2023).

Photograph 6



ISS drill barge and crane staged within Field Pilot Study area with environmental controls in place (10/05/2023).

Attachment 1
Daily Monitoring Logs

Daily Monitoring Log

Gasco Sediment Site ISS Pilot Study

ANCHOR QEA

Anchor QEA, LLC
6720 S Macadam Ave., Suite 300
Portland, OR 97219

Phone 503.670.1108

DATE: 10-2-2023

PERSONNEL: Simon Dudenhoefer

Wind from: N | NE | E | SE | (S) | SW | W | NW | NONE | (LIGHT) | MEDIUM | HEAVY

SUNNY | (CLOUDY) | RAIN

Temperature: (°F) 52 . °C
[Circle appropriate units]

TIME	COMMENTS
0615	Arrive @ Gasco → Calibrate YSI
0730	Begin ISS Drilling → start WQM Circuit #1 @ 0830
0745	H/S meeting (WQM crew): enter/exit boat wind/waves, wear PFDs, man overboard action plan, communication w/
———	drill crew
0800	ON water - USGS Willamette River Morrison Bridge Gauge
———	→ high tide @ 0730, next low tide @ 1441, will start
———	WQM @ BG-1S river flow downstream, ebb tide
0825	@ BG-1S confirmed 300' boom dist. w/ range finder and
———	Garmin depth reading w/ lead line.
0830	start WQM Circuit #1 (ebb tide) @ BG-1S
0850	@ EW-1N, confirmed 100' boom dist. w/ range finder
0915	@ CS-1N, " " 150' " "
0935	@ CS-2N " " 150' " "
0950	Finish WQM Circuit #1 - Start #2 @ 1030
1000	OFF WATER (2 hours)
1015	ON WATER → BG-1S
1030	@ BG-1S, confirmed 300' boom dist w/ range finder → start C#2
1040	@ EW-1N " " 100' " "
1055	@ CS-1N " " 150' " "
1105	@ CS-2N " "
1120	Finish WQM Circuit #2 → OFF WATER (1 hour)
1220	ON WATER → To BG-1S for WQM Circuit #3 (still ebb tide)
1230	@ BG-1S, confirmed 300' boom distance w/ range finder
1248	@ EW-1N " " 100' " "
1300	@ CS-1N " " 150' " "
1310	@ CS-2N " "
1330	OFF WATER, Finish WQM C#3 → start #4 @ 1430
1415	ON WATER → To BG-1S (still going out until 1440)
1430	@ BG-1S, confirmed 300' boom dist. w/ range finder

Signature: _____

Daily Monitoring Log

Gasco Sediment Site ISS Pilot Study

ANCHOR QEA

Anchor QEA, LLC
6720 S Macadam Ave., Suite 300
Portland, OR 97219

Phone 503.670.1108

DATE: 10-2-2023 @ 1430

PERSONNEL: Simon Dutenhoefer

Wind from: N | NE | E | SE | (S) | SW | W | NW | NONE | (LIGHT) | MEDIUM | HEAVY

SUNNY | (CLOUDY) | (RAIN)

Temperature: (°F) °C [Circle appropriate units]

TIME	COMMENTS
1430	@BG-15, Minnkota batery died, have to hold place
——	w/ regular motor, locations will be slightly off → *
——	confirmed 300' boom dist. w/ range finder
1445	@ EW-1N " "100' "
1455	@ CS-1N " "150' "
1510	@ CS-2N "
1525	Finish WQM Circuit #4, sediment disturbing
——	construction work done for the day → OFF WATER
	* Unable to collect flow velocity measurements during
	this round due to motor malfunction.

Signature: _____

Daily Monitoring Log

Gasco Sediment Site ISS Pilot Study

ANCHOR QEA

Anchor QEA, LLC
6720 S Macadam Ave., Suite 300
Portland, OR 97219

Phone 503.670.1108

DATE: 10-3-2023

PERSONNEL: Simon Dudenhoefer

Wind from: N | NE | E | SE | S | SW | (W) | NW

NONE | (LIGHT) | MEDIUM | HEAVY

SUNNY | (CLOUDY) | RAIN

Temperature: (°F) 56 . °C

[Circle appropriate units]

TIME	COMMENTS
0620	Arrive @ Gasco Trailer → Calibrate YSI #6970
0700	H+S meeting: Sewage in Willamette, overnight, extra careful w/ gloves, PPE, sanitation, wet dock, slips trips falls
0815	On water – start WQM circuit #2 @ 0830 (drilling start time @ 0730). Next tide high @ 0830 (USGS will. River Morrison Bridge Gauge), when flow of rives will become slack around WQM start time, then quickly flip to downstream ebb tide flows. Starting @ BG-1N, will swap to Ebb circuit when flow direction flips
0830	@ BG-1N, confirmed 300' boom distance w/ range finder. Confirmed Garmin depth reading w/ lead line.
0852	@ EW-1S, confirmed 100' boom distance w/ range finder
0900	@ CS-1S " " 150' "
0910	@ CS-2S " " "
0915	Decon. Van Dorn sampler
0925	Collect NWN-CS2S-23100309 2S and field dup. NWN-CS102S-23100309 2S @ CS-2S @ 47'
0930	Decon Van Dorn sampler
0945	Collected NWN-BG1N-23100309 4S @ BG-1N @ 43' (MS/MSD)
—	Finish WQM Circuit #2 → C#2 @ 1030
1000	OFF WATER
1015	ON WATER → To BG-1S (tide now going out until 1504
1039	@ BG-1S, confirmed 300' boom dist. w/ range finder
1048	@ EW-1N " " 100' " "
1101	@ CS-1N " " 150' " "
1117	@ CS-2N " " "
1130	Finish WQM circuit #2 → no exceedances. Next C#3 @ 1230
1145	OFF WATER
1215	ON WATER → TO BG-1S for WQM C#3 (ebb tide)
1230	@ BG-1S, confirmed 300' boom distance w/ range finder

Signature:

Daily Monitoring Log

Gasco Sediment Site ISS Pilot Study

ANCHOR QEA

Anchor QEA, LLC
6720 S Macadam Ave., Suite 300
Portland, OR 97219

Phone 503.670.1108

DATE: 10-3-2023
PERSONNEL: Simon Dudenhoefer

Wind from: N | NE | E | SE | S | SW | (W) | NW | NONE | (LIGHT) | MEDIUM | HEAVY
SUNNY | (CLOUDY) | RAIN

Temperature: (63). °C
[Circle appropriate units]

TIME	COMMENTS
1255	@ EW-1N, confirmed 100' boom distance w/ range finder
1307	@ CS-1N, " " 150' " "
1316	@ CS-2N, " "
1325	Finish WQM Circuit #3 → no exceedances (WQM C#4 @ 1430)
1330	OFF WATER → Drilling paused, push back C#4 start time
1445	ON WATER → Drilling started → start WQM C#4 (ebb tide)
1451	@ BG-1S, confirmed 300' boom distance w/ range finder
1504	@ EW-1N, " " 100' " "
—	NTU + pH exceeded threshold @ EW-1N, will take more time
—	monitoring compliance stations CS-1N and CS-2N
1527	@ CS-1N, confirmed 150' boom distance w/ range finder
—	↳ no parameters in exceedance
1534	@ CS-2N, confirmed 150' boom distance w/ range finder
—	↳ pH and NTU in exceedance @ 1540, confirmed @ 1545
—	↳ will return @ 1625 (45 min after reported exceedance to confirm
—	w/ third parameter reading.
1625	@ CS-2N, confirmed pH is in exceedance, turbidity fell
—	below threshold → reported exceedance to Ben (Ih).
1651	Start WQM Circuit #5 (flood tide, flow going upriver),
—	@ BG-1N, confirmed 300' boom distance w/ range finder
1702	@ EW-1S, " " 100' " "
—	Sheen observed outside of booms after large navy vessel passed
—	work area @ 1650, moving upriver, and created 2-2.5' swells
1715	@ CS-1S, confirmed 150' boom distance w/ range finder.
—	sheen mentioned @ EW-1S observed @ CS-1S
1728	@ CS-2S, confirmed 150' boom distance w/ range finder.
1740	Finish WQM Circuit #5 → No exceedances
1745	OFF WATER

Signature:

Daily Monitoring Log
Gasco Sediments Site ISS Pilot Study

ANCHOR QEA
Anchor QEA, LLC
6720 South Macadam Avenue, Suite 300
Portland, OR 97219
Phone 503.670.1108

Date: 10-4-2023
Personnel: Simon Pudenhoefer

Wind from: N | NE | E | SE | S | (SW) | W | NW | NONE | (LIGHT) | MEDIUM | HEAVY
SUNNY | (CLOUDY) | RAIN
Temperature: (°F 55) °C [Circle appropriate units]

Time	Comments
0630	Arrive @ Gasco Trailer → Calibrate YSI's
0650	Drilling start → start WQM Circuit #2 @ 0750
0730	H/S meeting: enter/exit boat, safely crossing booms on boat,
—	large wakes, slips trips and falls on ramp, wearing gloves
0740	ON WATER → To BG-1N (flood tide) — next high tide
—	@ 0914 (USGS Willamette River Morrison Bridge Gauge)
0750	@ BG-1N, confirmed 300' boom distance w/ lead line
—	Confirmed river flow (upriver) w/ velocimeter + visually
—	Confirmed Garmin depth reading w/ lead line
0813	@ EW-1S, confirmed 100' boom distance w/ range finder
0822	@ CS-1S, " " 150' " "
0833	@ CS-2S, " "
0900	FINISH WQM Circuit #1 → NO EXCEEDANCES
0910	OFF WATER → WQM Circuit #2 @ 0950 (ebb tide)
0945	ON WATER → To BG-1S for ebb tide WQM C#2
0950	@ BG-1S, confirmed 300' boom distance w/ range finder
—	↳ confirmed flow direction (downstream) visually + w/ velocimeter
0955	ISS Drilling complete for the day
1009	@ EW-1N, confirmed 100' boom distance w/ range finder
1029	@ CS-1N, " " 150' " "
1034	@ CS-2N, " "
1040	Finish WQM Circuit #2 → NO EXCEEDANCES
—	↳ waiting until debris removal commences before starting
—	WQM Circuit #3
1045	OFF WATER
1145	ON WATER → To BG-1S to start WQM Circuit #3 (Ebb tide)
1150	@ BG-1S, confirmed 300' boom distance w/ range finder
1206	@ EW-1N, " " 100' " "
1217	@ CS-1N " " 150' " "
1226	@ CS-2N " "

Signature:

Daily Monitoring Log
Gasco Sediments Site ISS Pilot Study

ANCHOR QEA

Anchor QEA, LLC
6720 South Macadam Avenue, Suite 300
Portland, OR 97219

Phone 503.670.1108

Date: 10-4-2023

Personnel: Simon Dudenhoefer

Wind from: (N) | NE | E | SE | S | SW | W | NW | NONE | (LIGHT) | MEDIUM | HEAVY

SUNNY | (CLOUDY) | RAIN

Temperature: (°F) 63 °C

[Circle appropriate units]

Time	Comments
1235	Finish WQM Circuit #3 – NO EXCEEDANCES
—	WQM C#4 Start time 1350 OR @ Start of ~~debris removal~~ * swell removal
1245	OFF WATER → waiting for ~~debris removal~~ * swell removal to start WQM C#4
—	* swell removal
1315	ON WATER → TO BG-1S (Ebb tide) for WQM Circuit #4
1317	Start SWELL REMOVAL → start WQM C#4 w/ samples
1319	@ BG-1S, confirmed 300' boom distance w/ range finder
1334	@ EW-1N, " " 100' " "
—	↳ waiting to collect parameter measurements until swell
—	removal starts. Swell removal start time pushed back
—	due to improperly placed booms. Decon. Van Dorn sampler.
SD	~~@CS-1N, confirmed 150' boom distance w/ range finder~~
1342	Swell Removal Start time → currently @ EW-1N, will
—	start monitoring water quality @ 1345
1353	@ CS-1N, confirmed 150' boom distance w/ range finder
1404	@CS-2N, " "
1415	Collect NWN-CS2S-231004141S @ CS-2S @ 43.6'
1420	Decon Van Dorn sampler @ BG-1S
1430	Collect NWN-BG1S-231004143pc BG-1S @ 38.4'
—	Finish WQM Circuit #4 → NO EXCEEDANCES
1435	OFF WATER

Signature: _____

Attachment 2
Water Quality Monitoring Calibration Logs

ANCHOR QEA

6720 S Macadam Ave., Suite 300
Portland, OR 98219

Water Quality Monitoring - Calibration Log Form
Gasco Sediment Site ISS Pilot Study

Date: 10-2-23
Probe S/N: 21E103678

Calibrated By: Simon Dudenhoefer
Meter(s) Model: YSI ProDSS #6970

Parameter	Calibration Standard	Standard Lot No.	Expiration Date	Initial Calibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.06	3GG0021	07/25	7.05	7.06	11.9	Δcal. stnd'd for temp
pH 4.00 (Standard Units)	4.00	3GF1085	06/25	4.02	4.00	12.1	
Dissolved Oxygen (DO)[1]	100.4	NA	NA	99.3	100.4	17.4	AIR
Turbidity (NTU)[1]	0	NA	NA	-0.20	0.00	12.3	DI WATER
Turbidity (NTU)[1]	124	23F2400346	06/24	121.52	123.96	12.3	

Date:
Probe S/N:

Calibrated By:
Meter(s) Model:

~~Parameter~~	Calibration Standard	Standard Lot No.	Expiration Date	Initial Calibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.00						
pH 4.00 (Standard Units)	4.00						
Dissolved Oxygen (DO)[1]							
Turbidity (NTU)[1]		DID NOT CALIBRATE/USE					?
~~Turbidity (NTU)[1]~~		BACKUP YSI #5006					

Notes:

1: Calibration standards are entered by hand depending on the monitoring instrument being used.

ANCHOR QEA

6720 S Macadam Ave., Suite 300
Portland, OR 98219

Water Quality Monitoring - Calibration Log Form
Gasco Sediments Site ISS Pilot Study

Date: 10-3-2023
Probe S/N: 21E103678

Calibrated By: Simon Dudenhoefer
Meter(s) Model: YSI ProDSS #6970

Parameter	Calibration Standard	Standard Lot No.	Expiration Date	Initial Calibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.05	3660021	07/25	7.12	7.04	14.6	Δstandard for Temp
pH 4.00 (Standard Units)	4.00	36F1085	06/25	4.13	4.00	14.6	
Dissolved Oxygen (DO)[1]	100.3	NA	NA	102.5	100.3	17.1	AIR
Turbidity (NTU)[1]	0.00	NA	NA	-0.03	0.00	14.8	DI WATER
Turbidity (NTU)[1]	124	23F24003426	06/24	126.36	124.01	14.8	

Date:
Probe S/N:

Calibrated By:
Meter(s) Model:

Parameter	Calibration Standard	Standard Lot No.	Expiration Date	Initial Calibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.00						
pH 4.00 (Standard Units)	4.00						
Dissolved Oxygen (DO)[1]							
Turbidity (NTU)[1]	DID NOT USE/CALIBRATE BACKUP YSI						
Turbidity (NTU)[1]							

Notes:

1: Calibration standards are entered by hand depending on the monitoring instrument being used.

ANCHOR QEA

6720 S Macadam Ave., Suite 300
Portland, OR 98219

Water Quality Monitoring - Calibration Log Form
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023
Probe S/N: 21E103678

Calibrated By: Simon Dudenhoefer
Meter(s) Model: YSI ProDSS #6970

Parameter	Calibration Standard	Standard Lot No.	Expiration Date	Initial Caibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.00	3GG0021	07/25	6.97	7.05	12.2	Astandard for temp
pH 4.00 (Standard Units)	4.00	3GF1085	06/25	3.95	4.00	12.4	
Dissolved Oxygen (DO)[1]	101.1	NA	NA	101.0	101.2	17.1	AIR
Turbidity (NTU)[1]	0	NA	NA	-0.01	0.00	12.6	DI WATER
Turbidity (NTU)[1]	124	23F24003426	06/24	123.95	124.0	12.6	

Date: 10-4-2023
Probe S/N: 22G102376

Calibrated By: Simon Dudenhoefer
Meter(s) Model: YSI ProDSS # 5006

Parameter	Calibration Standard	Standard Lot No.	Expiration Date	Initial Caibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.00	3GG0021	07/25	7.02	7.05	12.8	Astandard for temp
pH 4.00 (Standard Units)	4.00	3GF1085	06/25	4.02	4.00	12.9	
Dissolved Oxygen (DO)[1]	101.2	NA	NA	101.2	101.2	17.1	AIR
Turbidity (NTU)[1]	0	NA	NA	-0.54	0.00	13.1	DI WATER
Turbidity (NTU)[1]	124	23F24003426	06/24	124.88	123.95	13.1	

Notes:

1: Calibration standards are entered by hand depending on the monitoring instrument being used.

Attachment 3
Water Quality Monitoring Forms – Field Parameters

ANCHOR QEA

6720 S Macadam Ave., Suite 300
Portland, OR 97219

Probe #21E103678 YSI ProDSS #6970

Water Quality Monitoring Form - Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-2-23 **Circuit Number:** 1

Station: (BG) EW CS-1 CS-2 N (S) Time: 0830

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.012

Lat/Northing: 45.57874 Long/Easting: 122.75406 Total Water Depth: 40

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.69	7.31	9.84	16.4
Middle	20	2.20	7.27	9.79	16.4
Deep	37	2.38	7.26	9.76	16.4

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 0850

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.058

Lat/Northing: 45.58008 Long/Easting: 122.75694 Total Water Depth: 46.6

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.76	7.26	9.83	16.4
Middle	23.3	1.99	7.30	9.81	16.4
Deep	43.6	4.13	8.39	9.73	16.4

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103678 YSI ProDSS #6970

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Gasco Sediments Site ISS Pilot Study

Date: 10-2-2023 **Circuit Number:** 1

Station: BG EW (CS-1) CS-2 (N) S Time: 0915

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.393

Lat/Northing: 45.58027 Long/Easting: 122.75744 Total Water Depth: 45.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.60	7.36	9.84	16.4
Middle	22.7	1.92	7.19	9.83	16.4
Deep	42.4	2.61	7.36	9.75	16.4

Comments[1]: • Minor sheen not related to construction activities observed (3-4 1/4 sized spots of grey ebullition related sheen)
• No odors, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S Time: 0935

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.836

Lat/Northing: 45.58025 Long/Easting: 122.75675 Total Water Depth: 48

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.52	7.29	9.87	16.4
Middle	24	1.88	7.24	9.81	16.3
Deep	45	2.81	7.50	9.76	16.3

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-2-2023 **Circuit Number:** 2

Station: (BG) EW CS-1 CS-2 N (S) Time: 1030

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.459

Lat/Northing: 45.57876 Long/Easting: 122.75401 Total Water Depth: 40.6

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	2.09	7.30	9.89	16.3
Middle	20.3	1.90	7.23	9.87	16.3
Deep	37.6	1.94	7.27	9.84	16.3

Comments[1]:
- No sheen, odor, suspended material, or discoloration observed related to construction activity

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 1040

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.389

Lat/Northing: 45.58015 Long/Easting: 122.75696 Total Water Depth: 46

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.97	7.26	9.89	16.3
Middle	23	2.04	7.25	9.86	16.3
Deep	43	3.09	7.30	9.83	16.3

Comments[1]:
- Ebulition related minor sheen observed, not construction related
- No odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dutenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-2-2023 **Circuit Number:** 2

Station: BG EW (CS-1) CS-2 (N) S **Time:** 1055

Flood (Ebb) Up River / (Down River) **Avg. Velocity:** 0.549

Lat/Northing: 45.58029 **Long/Easting:** 122.75746 **Total Water Depth:** 44

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	2.54	7.27	9.90	16.3
Middle	22	2.41	7.28	9.87	16.3
Deep	41	2.50	7.27	9.84	16.3

Comments[1]: o No sheen, odor, discoloration, or suspended materials observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S **Time:** 1105

Flood / (Ebb) Up River / (Down River) **Avg. Velocity:** 0.487

Lat/Northing: 45.58028 **Long/Easting:** 122.75676 **Total Water Depth:** 47.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.73	7.21	9.93	16.3
Middle	23.7	1.92	7.22	9.89	16.3
Deep	44.4	2.23	7.25	9.85	16.3

Comments[1]: o No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Water Quality Monitoring Form - Field Parameters
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Date: 10-2-23 **Circuit Number:** 3

Station: (BG) EW CS-1 CS-2 N (S) Time: 1230

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.056

Lat/Northing: 45.57874 Long/Easting: 122.75405 Total Water Depth: 40

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.53	7.32	10.04	16.3
Middle	20	2.22	7.24	9.87	16.2
Deep	37	2.76	7.25	9.81	16.2

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 1248

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.124

Lat/Northing: 45.58003 Long/Easting: 122.75699 Total Water Depth: 43.7

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.70	7.29	9.93	16.3
Middle	21.85	2.08	7.24	9.85	16.2
Deep	40.7	2.52	7.29	9.81	16.2

Comments[1]: • No sheen, odor, discoloration, or suspented material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-2-23 **Circuit Number:** 3

Station: BG EW (CS-1) CS-2 (N) S **Time:** 1300

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.317

Lat/Northing: 45.58026 Long/Easting: 122.75747 Total Water Depth: 43.1

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.56	7.28	9.97	16.3
Middle	21.7	2.24	7.26	9.87	16.2
Deep	40.4	2.45	7.25	9.82	16.2

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S **Time:** 1310

Flood / (Ebb) Up River / Down River Avg. Velocity: 0.351

Lat/Northing: 45.58022 Long/Easting: 122.75675 Total Water Depth: 46.5

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.23	7.25	10.06	16.3
Middle	23.25	1.65	7.21	9.89	16.2
Deep	43.5	2.47	8.00	9.82	16.2

Comments[1]: • No sheen, odors, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dutenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-2-2023 **Circuit Number:** 4

Station: (BG) EW CS-1 CS-2 N (S) Time: 1430

Flood / (Ebb) Up River / (Down River) Avg. Velocity: — SD

Lat/Northing: 45.57877 Long/Easting: 122.75419 Total Water Depth: 35

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.60	7.22	10.05	16.3
Middle	17.5	1.71	7.19	9.90	16.2
Deep	32	2.38	7.22	9.84	16.2

Comments[1]: • No ~~sheen~~, odor, sheen, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 1445

Flood / (Ebb) Up River / Down River Avg. Velocity: — SD

Lat/Northing: 45.58011 Long/Easting: 122.75689 Total Water Depth: 43

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.41	7.29	10.10	16.3
Middle	21.5	1.59	7.23	9.96	16.2
Deep	40	3.38	7.60	9.81	16.2

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-2-2023 **Circuit Number:** 4

Station: BG EW (CS-1) CS-2 (N) S **Time:** 1455

Flood / (Ebb) Up River / (Down River) Avg. Velocity: — ~~SD~~

Lat/Northing: 45.58033 Long/Easting: 122.75743 Total Water Depth: 42.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.46	7.32	10.07	16.3
Middle	21.2	1.78	7.29	9.92	16.2
Deep	39.4	2.25	7.91	9.78	16.2

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S **Time:** 1510

Flood / (Ebb) Up River / (Down River) Avg. Velocity: — ~~SD~~

Lat/Northing: 45.58022 Long/Easting: 122.75675 Total Water Depth: 43.6

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.28	7.28	10.10	16.2
Middle	21.8	1.84	7.23	9.93	16.2
Deep	40.6	4.57	7.46	9.85	16.2

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-3-23 **Circuit Number:** 1

Station: (BG) EW CS-1 CS-2 (N) S Time: 0830

(Flood) / Ebb (Up River) / Down River Avg. Velocity: 0.298

Lat/Northing: 45.58039 Long/Easting: 122.75802 Total Water Depth: 46.2

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.65	7.19	9.71	16.1
Middle	23.1	1.71	7.23	9.66	16.1
Deep	43.2	1.69	7.21	9.63	16.1

Comments[1]: • No sheen, odor, discoloration, suspended material observed
• Collected MS/MSD sample here @ Deep interval (43')

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 N (S) Time: 0852

(Flood) / Ebb (Up River) / Down River Avg. Velocity: 0.038

Lat/Northing: 45.57912 Long/Easting: 122.75495 Total Water Depth: 44

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.42	7.26	9.71	16.1
Middle	22	1.89	7.32	9.66	16.1
Deep	41	1.82	7.35	9.64	16.0

Comments[1]: • No construction related sheen observed, some ebullition derived sheen observed (minor)
• No odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Water Quality Monitoring Form - Field Parameters
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Date: 10-3-2023 **Circuit Number:** 1

Station: BG EW (CS-1) CS-2 N (S) Time: 0900

(Flood) / Ebb (Up River) / Down River Avg. Velocity: 0.091

Lat/Northing: 45.57895 Long/Easting: 122.75460 Total Water Depth: 40.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.34	7.27	9.72	16.1
Middle	20.2	1.62	7.28	9.68	16.1
Deep	37.4	1.75	7.27	9.65	16.1

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) N (S) Time: 0910

(Flood) / Ebb (Up River) / Down River Avg. Velocity: 0.023

Lat/Northing: 45.57952 Long/Easting: 122.75493 Total Water Depth: 50

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.46	7.27	9.73	16.1
Middle	25	1.64	7.27	9.67	16.1
Deep	47	2.16	7.31	9.62	16.1

Comments[1]: • No sheen, odor, discoloration, or suspended material observed
• Collected chemistry sample here @ deep interval (47') and field duplicate due to highest CS NTU.

Construction Activity: ISS Drilling

Recorded by: Simon Dutenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe # 21E103678 YSI ProDSS #6970

Water Quality Monitoring Form - Field Parameters
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Date: 10-3-2023 **Circuit Number:** 2

Station: (BG) EW CS-1 CS-2 N (S) Time: 1030

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.622

Lat/Northing: 45.57877 Long/Easting: 122.75401 Total Water Depth: 42.2

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.47	7.12	9.78	16.0
Middle	21.1	2.16	7.12	9.68	15.9
Deep	39.2	2.40	7.20	9.64	15.9

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 1048

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.446

Lat/Northing: 45.58007 Long/Easting: 122.75697 Total Water Depth: 45.6

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.56	7.21	9.76	16.0
Middle	22.8	1.51	7.19	9.73	16.0
Deep	42.6	2.56	7.21	9.65	15.9

Comments[1]: • No sheen, odor, suspended material, or discoloration observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-3-2023 **Circuit Number:** 2

Station: BG EW (CS-1) CS-2 (N) S **Time:** 1101

Flood / (Ebb) Up River / (Down River) **Avg. Velocity:** 0.303

Lat/Northing: 45.58030 **Long/Easting:** 122.75739 **Total Water Depth:** 45.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.65	7.17	9.74	16.0
Middle	22.7	1.87	7.15	9.69	16.0
Deep	42.4	2.71	7.19	9.64	16.0

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S **Time:** 1117

Flood / (Ebb) Up River / (Down River) **Avg. Velocity:** 0.768

Lat/Northing: 45.58023 **Long/Easting:** 122.75681 **Total Water Depth:** 47.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.46	7.14	9.76	16.0
Middle	23.7	1.75	7.12	9.68	15.9
Deep	44.4	1.96	7.18	9.65	15.9

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Water Quality Monitoring Form - Field Parameters
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Date: 10-3-2023 **Circuit Number:** 3

Station: (BG) EW CS-1 CS-2 N (S) Time: 1230

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.062

Lat/Northing: 45.57872 Long/Easting: 122.75416 Total Water Depth: 36

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.56	7.21	9.81	16.0
Middle	18	2.23	7.18	9.72	15.9
Deep	33	2.39	7.20	9.68	15.9

Comments[1]: No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 1255

Flood / ~~Ebb~~ Up River / ~~Down River~~ Avg. Velocity: 0.029

Lat/Northing: 45.57998 Long/Easting: 122.75694 Total Water Depth: 43.6

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.73	7.22	9.76	15.9
Middle	21.8	1.95	7.20	9.70	15.9
Deep	40.6	2.22	7.20	9.65	15.9

Comments[1]: No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-3-2023 **Circuit Number:** 3

Station: BG EW (CS-1) CS-2 (N) S Time: 1307

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.064

Lat/Northing: 45.58022 Long/Easting: 122.75739 Total Water Depth: 42.8

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.54	7.23	9.80	16.0
Middle	21.4	2.07	7.22	9.69	15.9
Deep	39.8	2.92	7.18	9.64	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S Time: 1316

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.193

Lat/Northing: 45.58020 Long/Easting: 122.75680 Total Water Depth: 45.2

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.93	7.21	9.78	16.0
Middle	22.6	2.95	7.15	9.67	15.8
Deep	42.2	3.05	7.15	9.65	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Water Quality Monitoring Form - Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-3-2023 **Circuit Number:** 4

Station: (BG) EW CS-1 CS-2 N (S) Time: 1451

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.358

Lat/Northing: 45.57876 Long/Easting: 122.75409 Total Water Depth: 37.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	0.94	7.32	10.07	16.3
Middle	18.7	2.04	7.24	9.78	15.8
Deep	34.4	2.41	7.20	9.71	15.7

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 1504

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.201

Lat/Northing: 45.58008 Long/Easting: 122.75685 Total Water Depth: 44.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.10	7.31	9.99	16.3
Middle	22.2	2.21	7.20	9.76	15.8
Deep	41.4	10.11	9.16	9.63	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Water Quality Monitoring Form - Field Parameters
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Date: 10-3-2023 **Circuit Number:** 4

Station: BG EW (CS-1) CS-2 (N) S Time: 1527

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.335

Lat/Northing: 45.58032 Long/Easting: 122.75754 Total Water Depth: 42.8

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	0.92	7.28	10.04	16.5
Middle	21.4	1.83	7.18	9.77	15.8
Deep	39.8	2.73	7.27	9.70	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S Time: 1534

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.335

Lat/Northing: 45.58021 Long/Easting: 122.75675 Total Water Depth: 45

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	0.95	7.27	10.12	16.3
Middle	22.5	1.76	7.16	9.79	15.8
Deep	42	7.76	9.39	9.60	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed
• NTU and ph values in exceedance @ 1540
• Confirmed exceedance @ 1545 (left YSI @ 42.4' for 5 min)

Construction Activity: ISS Drilling

Recorded by: Simon Dutenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103678 YSI ProDSS #6970

Water Quality Monitoring Form - Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-3-2023	**Circuit Number:** 4
Station: BG EW CS-1 ~~CS-2~~ (N) S	Time: 1625
Flood / ~~Ebb~~	Up River / ~~Down River~~ Avg. Velocity: 0.329
Lat/Northing: 45.58021	Long/Easting: 122.75675 Total Water Depth: 45

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.18	7.34	10.03	16.3
Middle	22.5	1.99	7.23	9.77	15.8
Deep	42	3.39	8.99	9.68	15.8

Comments[1]: • Returned to CS-2N after 45 minutes to confirm ph + NTU exceedances
• NTU dropped below threshold and ph stayed in exceedance after third reading @ 1625

Construction Activity: ISS Drilling

Station: BG EW CS-1 CS-2 N S	Time:
Flood / Ebb	Up River / Down River Avg. Velocity:
Lat/Northing:	Long/Easting: Total Water Depth:

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface					
Middle					
Deep					

Comments[1]: SD

Construction Activity:

Recorded by: Simon Pudenhaefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Date: 10-3-2023 **Circuit Number:** 5

Station: (BG) EW CS-1 CS-2 (N) S **Time:** 1651

(Flood) / Ebb (Up River) / Down River **Avg. Velocity:** 0.237

Lat/Northing: 45.58039 **Long/Easting:** 122.75804 **Total Water Depth:** 41.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.03	7.37	10.13	16.6
Middle	20.7	1.93	7.32	9.78	15.8
Deep	38.4	2.79	8.21	9.70	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 N (S) **Time:** 1702

(Flood) / Ebb Up River / Down River **Avg. Velocity:** 0.372

Lat/Northing: 45.57916 **Long/Easting:** 122.75478 **Total Water Depth:** 43

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	0.82	7.28	10.17	16.5
Middle	21.5	1.80	7.29	9.81	15.8
Deep	40	3.35	8.05	9.68	15.7

Comments[1]: • Sheen observed outside of booms after a large Navy vessel passed the work area @ 1650, sheen had been contained by booms until the vessel created 2-2.5' tall swells

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103678 YSI ProDSS #6970

Water Quality Monitoring Form - Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-3-2023 **Circuit Number:** 5

Station: BG EW (CS-1) CS-2 N (S) Time: 1715

(Flood) / Ebb | (Up River) / Down River | Avg. Velocity: 0.451

Lat/Northing: 45.57891 | Long/Easting: 122.75436 | Total Water Depth: 40

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.61	7.38	9.93	16.1
Middle	20	2.41	7.59	9.80	15.8
Deep	37	6.98	8.32	9.68	15.8

Comments[1]: • Sheen observed outside of booms after a large Navy vessel passed the work area @ 1650, sheen had been contained by booms until the vessel created 2-2.5' tall swells which appears to have passed over the booms.

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) N (S) Time: 1728

(Flood) / Ebb | (Up River) / Down River | Avg. Velocity: 0.683

Lat/Northing: 45.57944 | Long/Easting: 122.75500 | Total Water Depth: 44.4

	Water Depth [feet]	Turbidity [NTU]	pH [-]	D.O. [mg/L]	Temp. [deg-C]
Surface	1	1.05	7.29	10.05	16.3
Middle	22.2	2.26	7.38	9.77	15.8
Deep	41.4	2.77	8.28	9.67	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Ludenhoefer

[1] Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103578 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 1

Station: (BG) EW CS-1 CS-2 (N) S Time: 0750

(Flood) / Ebb (Up River) / Down River Avg. Velocity: 0.428

Lat/Northing: 45.58040 Long/Easting: 122.75808 Total Water Depth: 43

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.48	7.22	9.83	15.7
Middle	21.5	1.84	7.24	9.77	15.7
Deep	40	2.15	7.23	9.71	15.7

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 N (S) Time: 0813

(Flood) / Ebb (Up River) / Down River Avg. Velocity: 0.549

Lat/Northing: 45.57910 Long/Easting: 122.75487 Total Water Depth: 42.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.51	7.18	9.85	15.7
Middle	21.2	1.98	7.29	9.77	15.7
Deep	39.4	5.51	7.74	9.72	15.7

Comments[1]: • Ebullition related minor sheen observed, no construction related sheen, odor, discoloration, or suspended material observed • Construction related sheen contained inside boom

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe # 21E103678 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 1

Station: BG EW ~~CS-1~~ CS-2 N (S) Time: 0822

(Flood) / Ebb ~~Up River~~ / Down River Avg. Velocity: 0.574

Lat/Northing: 45.57893 Long/Easting: 122.75461 Total Water Depth: 39.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.55	7.28	9.80	15.7
Middle	19.8	3.08	7.39	9.75	15.7
Deep	36.6	2.74	7.39	9.73	15.7

Comments[1]: • No sheen observed outside of boom, all construction related sheen contained inside boom
• No odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) N (S) Time: 0833

(Flood) / Ebb ~~Up River~~ / Down River Avg. Velocity: 0.593

Lat/Northing: 45.57942 Long/Easting: 122.75494 Total Water Depth: 45.8

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.47	7.23	9.85	15.7
Middle	22.9	1.58	7.22	9.78	15.7
Deep	42.8	1.76	7.36	9.69	15.7

Comments[1]: • Hit river bottom w/ probe causing elevated NTU, had to wait ~15 minutes for NTU to stabilize
• No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103678 YSI ProDSS #6470

Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 2

Station: (BG) EW CS-1 CS-2 N (S) Time: 0950

Flood / (Ebb) Up River / Down River Avg. Velocity: 0.002

Lat/Northing: 45.57870 Long/Easting: 122.75396 Total Water Depth: 39

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.20	7.37	9.98	15.8
Middle	19.5	1.46	7.34	9.85	15.7
Deep	36	1.68	7.36	9.80	15.7

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG (EW) CS-1 CS-2 (N) S Time: 1005

Flood / (Ebb) Up River / Down River Avg. Velocity: 0.072

Lat/Northing: 45.58002 Long/Easting: 122.75702 Total Water Depth: 43.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.35	7.35	9.87	15.8
Middle	21.7	1.62	7.33	9.77	15.8
Deep	40.9	1.84	7.56	9.76	15.7

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E03678 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 2

Station: BG EW (CS-1) CS-2 (N) S **Time:** 1020

Flood / (Ebb) Up River / (Down River) **Avg. Velocity:** 0.295

Lat/Northing: 45.58022 **Long/Easting:** 122.75747 **Total Water Depth:** 43.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.12	7.32	9.93	15.8
Middle	21.8	1.66	7.29	9.81	15.7
Deep	40.6	1.98	7.70	9.77	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S **Time:** 1034

Flood (Ebb) Up River / (Down River) **Avg. Velocity:** 0.282

Lat/Northing: 45.58019 **Long/Easting:** 122.75678 **Total Water Depth:** 46.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.28	7.27	9.94	15.8
Middle	23.2	1.80	7.28	9.80	15.7
Deep	43.4	1.96	7.34	9.76	15.7

Comments[1]: • Minor sheen observed, non-construction related (eboulitmo)
• No odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

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Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 3

Station: (BG) EW CS-1 CS-2 N (S) Time: 1150

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.561

Lat/Northing: 45.57873 Long/Easting: 122.75402 Total Water Depth: 40.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.42	7.30	10.00	15.9
Middle	20.3	1.64	7.30	9.89	15.8
Deep	37.6	1.74	7.28	9.84	15.8

Comments[1]: • No construction occurring @ time of monitoring, minor sheen observed (not construction related)
• No odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling,

Station: BG (EW) CS-1 CS-2 (N) S Time: 1206

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.716

Lat/Northing: 45.58013 Long/Easting: 122.75697 Total Water Depth: SDI 45.8

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.36	7.32	10.03	15.9
Middle	22.9	1.56	7.28	9.88	15.8
Deep	42.8	1.77	7.29	9.83	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103678 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 3

Station: BG EW (CS-1) CS-2 (N) S Time: 1217

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.355

Lat/Northing: 45.58029 Long/Easting: 122.75759 Total Water Depth: 43

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.51	7.28	9.95	15.8
Middle	21.5	1.73	7.29	9.87	15.8
Deep	40	1.85	7.27	9.83	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 (CS-2) (N) S Time: 1226

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.254

Lat/Northing: 45.58029 Long/Easting: 122.75683 Total Water Depth: 46.8

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.53	7.28	9.95	15.8
Middle	23.4	2.05	7.28	9.83	15.8
Deep	43.8	2.03	7.30	9.80	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103678 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 4

Station: (BG) EW CS-1 CS-2 N (S) Time: 1319

Flood / (Ebb) Up River / (Down River) Avg. Velocity: 0.239

Lat/Northing: 45.57874 Long/Easting: 122.75405 Total Water Depth: 41.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.73	7.34	9.92	15.8
Middle	20.7	1.98	7.33	9.89	15.8
Deep	38.4	2.11	7.31	9.83	15.8

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling, swell removal

Station: BG (EW) CS-1 CS-2 (N) S Time: 1345

Flood / (Ebb) Up River / Down River Avg. Velocity: 0.220

Lat/Northing: 45.58005 Long/Easting: 122.75689 Total Water Depth: 45.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.64	7.32	9.97	15.8
Middle	22.7	1.87	7.31	9.85	15.8
Deep	42.4	2.39	7.35	9.79	15.7

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling, swell removal

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

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Probe #21E103678 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters
Gasco Sediments Site ISS Pilot Study

Date: 10-4-2023 **Circuit Number:** 4

Station: BG EW (CS-1) CS-2 (N) S **Time:** 1353

Flood / (Ebb) Up River / (Down River) **Avg. Velocity:** 0.197

Lat/Northing: 45.58029 **Long/Easting:** 122.75752 **Total Water Depth:** 44.2

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.66	7.31	9.96	15.8
Middle	22.1	2.03	7.28	9.86	15.8
Deep	41.2	2.07	7.31	9.79	15.7

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling, swell removal

Station: BG EW CS-1 (CS-2) (N) S **Time:** 1404

Flood / (Ebb) Up River / (Down River) **Avg. Velocity:** 0.232

Lat/Northing: 45.58015 **Long/Easting:** 122.75686 **Total Water Depth:** 46.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.58	7.30	9.97	15.8
Middle	23.3	1.75	7.24	9.86	15.7
Deep	43.6	2.18	7.32	9.80	15.7

Comments[1]: • No sheen, odor, discoloration, or suspended material observed

• Collecting chemistry sample here @ 43.6' (highest CS NTU)

Construction Activity: ISS Drilling, swell removal

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.

Attachment 4
Water Quality Sampling Forms – Chemical Parameters

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Circuit #2 - Flood Tite - ISS Drilling

Water Quality Sampling Form - Chemical Parameters
Gasco Sediment Site ISS Pilot Study

Background Station ID: BG-IN		
Lat/Northing: 45.58040	Long/Easting: 122.75804	
Total Water Depth: 46	Sample Depth: 43	
Sample ID: NWN-BGIN-2310030945	Date: 10-3-23	Time: 0945
Comments[1]: • MS/MSD sample (x3 volume) • Collected using Van Dorn sampler • Collected x6 125ml amber glass and x6 amber poly containers • No sheen, odor, discoloration, or suspended material observed		
Compliance Station ID: CS-2S		
Lat/Northing: 45.57952	Long/Easting: 122.75493	
Total Water Depth: 50	Sample Depth: 47	
Sample ID: NWN-CS2S-2310030925	Date: 10-3-23	Time: 0925
Comments[1]: • Collecting regular own and field duplicate sample wse • Collected using Van Dorn sampler ↳NWN-CS102S-2310030925 • Collected x2 125ml amber glass and x2 amber poly containers for each sample • No sheen, odor, discoloration, or suspended material observed		

Analytical Suite

Analyte	Bottle	Method	Preservative
Free Cyanide	125-mL Amber Poly	ASTM D4282	NaOH
	125-mL Amber Poly		None
PAHs	2 X 125-mL Amber Glass	EPA 8270D SIM	None

[1] Observations of floating/suspended material, sheens, discoloration, and /or odors will be recorded in the comments

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Circuit #4 - Ebb Tide - ISS Swell Removal

Water Quality Sampling Form - Chemical Parameters
Gasco Sediment Site ISS Pilot Study

Background Station ID: BG-1S		
Lat/Northing: 45.57879	Long/Easting: 122.75405	
Total Water Depth: 41.4	Sample Depth: 38.4	
Sample ID: NWN-BG1S-2310041430	Date: 10-4-23	Time: 1430
Comments[1]: • Collected using Van Dorn sampler • Collected x2 125 ml amber glass + x2 125 ml amber poly containers • No sheen, odor, discoloration, or suspended material observed		
Compliance Station ID: CS-2N		
Lat/Northing: 45.58015	Long/Easting: 122.75686	
Total Water Depth: 46.6	Sample Depth: 43.6	
Sample ID: NWN-CS2N-2310041415	Date: 10-4-23	Time: 1415
Comments[1]: • Collected using Van Dorn sampler • Collected x2 125ml amber glass and x2 125ml amber poly containers • No sheen, odor, discoloration, or suspended material observed		

Analytical Suite

Analyte	Bottle	Method	Preservative
Free Cyanide	125-mL Amber Poly	ASTM D4282	NaOH
	125-mL Amber Poly		None
PAHs	2 X 125-mL Amber Glass	EPA 8270D SIM	None

[1] Observations of floating/suspended material, sheens, discoloration, and /or odors will be recorded in the comments

Attachment 5
Water Quality Field Parameter Measurements

Water Quality Field Parameter Measurements
Gasco Sediments Site ISS Field Pilot Study

Circuit No.	Monitoring Date	Time	Flow Direction (Upriver/ Downriver)	Station	North/ South	Total Water Depth (feet)	Monitoring Depth (feet)	Depth Zone	Measured Turbidity (NTU)	Background Corrected Turbidity (NTU)[1]	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
1	10/2/2023	8:30	Downriver	BG-1S	South	40.0	1	Surface	1.69	--	7.31	9.84	16.4	
							20	Middle	2.2	--	7.27	9.79	16.4	
							37.0	Deep	2.38	--	7.26	9.76	16.4	
		8:50		EW-1N	North	46.6	1	Surface	1.76	0.07	7.26	9.83	16.4	
							23.3	Middle	1.99	-0.21	7.30	9.81	16.4	
							43.6	Deep	4.13	1.75	8.39	9.73	16.4	
		9:15		CS-1N	North	45.4	1	Surface	1.6	-0.09	7.36	9.84	16.4	
							22.7	Middle	1.92	-0.28	7.19	9.83	16.4	
							42.4	Deep	2.61	0.23	7.36	9.75	16.4	
		9:35		CS-2N	North	48.0	1	Surface	1.52	-0.17	7.29	9.87	16.4	
							24.0	Middle	1.88	-0.32	7.24	9.81	16.3	
							45.0	Deep	2.81	0.43	7.50	9.76	16.3	
2	10/2/2023	10:30	Downriver	BG-1S	South	40.6	1	Surface	2.09	--	7.3	9.89	16.3	
							20.3	Middle	1.9	--	7.23	9.87	16.3	
							37.6	Deep	1.94	--	7.27	9.84	16.3	
		10:40		EW-1N	North	46.0	1	Surface	1.97	-0.12	7.26	9.89	16.3	
							23	Middle	2.04	0.14	7.25	9.86	16.3	
							43	Deep	3.09	1.15	7.30	9.83	16.3	
		10:55		CS-1N	North	44.0	1	Surface	2.54	0.45	7.27	9.9	16.3	
							22	Middle	2.41	0.37	7.28	9.87	16.3	
							41	Deep	2.50	0.56	7.27	9.84	16.3	
		11:05		CS-2N	North	47.4	1	Surface	1.73	-0.36	7.21	9.93	16.3	
							23.7	Middle	1.92	0.02	7.22	9.89	16.3	
							44.4	Deep	2.23	0.29	7.25	9.85	16.3	

Water Quality Field Parameter Measurements
Gasco Sediments Site ISS Field Pilot Study

Circuit No.	Monitoring Date	Time	Flow Direction (Upriver/ Downriver)	Station	North/ South	Total Water Depth (feet)	Monitoring Depth (feet)	Depth Zone	Measured Turbidity (NTU)	Background Corrected Turbidity (NTU)[1]	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
3	10/2/2023	12:30	Downriver	BG-1S	South	40.0	1	Surface	1.53	--	7.32	10.04	16.3	
							20	Middle	2.22	--	7.24	9.87	16.2	
							37.0	Deep	2.76	--	7.25	9.81	16.2	
		12:48		EW-1N	North	43.7	1	Surface	1.7	0.17	7.29	9.93	16.3	
							21.85	Middle	2.08	-0.14	7.24	9.85	16.2	
							40.7	Deep	2.52	-0.24	7.29	9.81	16.2	
		13:00		CS-1N	North	43.4	1	Surface	1.56	0.03	7.28	9.97	16.3	
							21.7	Middle	2.24	0.02	7.26	9.87	16.2	
							40.4	Deep	2.45	-0.31	7.25	9.82	16.2	
		13:10		CS-2N	North	46.5	1	Surface	1.23	-0.3	7.25	10.06	16.3	
							23.25	Middle	1.65	-0.57	7.21	9.89	16.2	
							43.5	Deep	2.47	-0.29	8	9.82	16.2	
4	10/2/2023	14:30	Downriver	BG-1S	South	35.0	1	Surface	1.6	--	7.22	10.05	16.3	
							17.5	Middle	1.71	--	7.19	9.9	16.2	
							32.0	Deep	2.38	--	7.22	9.84	16.2	
		14:45		EW-1N	North	43.0	1	Surface	1.41	-0.19	7.29	10.1	16.3	
							21.5	Middle	1.59	-0.12	7.23	9.96	16.2	
							40	Deep	3.38	1.00	7.60	9.81	16.2	
		14:55		CS-1N	North	42.4	1	Surface	1.46	-0.14	7.32	10.07	16.3	
							21.2	Middle	1.78	0.07	7.29	9.92	16.2	
							39.4	Deep	2.25	-0.13	7.91	9.78	16.2	
		15:10		CS-2N	North	43.6	1	Surface	1.28	-0.32	7.28	10.1	16.2	
							21.8	Middle	1.84	0.13	7.23	9.93	16.2	
							40.6	Deep	4.57	2.19	7.46	9.85	16.2	

Water Quality Field Parameter Measurements
Gasco Sediments Site ISS Field Pilot Study

Circuit No.	Monitoring Date	Time	Flow Direction (Upriver/ Downriver)	Station	North/ South	Total Water Depth (feet)	Monitoring Depth (feet)	Depth Zone	Measured Turbidity (NTU)	Background Corrected Turbidity (NTU)[1]	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
1	10/3/2023	8:30	Upriver	BG-1N	North	46.2	1	Surface	1.65	--	7.19	9.71	16.1	
							23.1	Middle	1.71	--	7.23	9.66	16.1	
							43.2	Deep	1.69	--	7.21	9.63	16.1	X
		8:52		EW-1S	South	44	1	Surface	1.42	-0.23	7.26	9.71	16.1	
							22	Middle	1.89	0.18	7.32	9.66	16.1	
							41	Deep	1.82	0.13	7.35	9.64	16.0	
		9:00		CS-1S	South	40.4	1	Surface	1.34	-0.31	7.27	9.72	16.1	
							20.2	Middle	1.62	-0.09	7.28	9.68	16.1	
							37.4	Deep	1.75	0.06	7.27	9.65	16.1	
		9:10		CS-2S	South	50.0	1	Surface	1.46	-0.19	7.27	9.73	16.1	
							25.00	Middle	1.64	-0.07	7.27	9.67	16.1	
							47.0	Deep	2.16	0.47	7.31	9.62	16.1	X
2	10/3/2023	10:30	Downriver	BG-1S	South	42.2	1	Surface	1.47	--	7.12	9.78	16.0	
							21.1	Middle	2.16	--	7.12	9.68	15.9	
							39.2	Deep	2.40	--	7.20	9.64	15.9	
		10:48		EW-1N	North	45.6	1	Surface	1.56	0.09	7.21	9.76	16.0	
							22.8	Middle	1.51	-0.65	7.19	9.73	16.0	
							42.6	Deep	2.56	0.16	7.21	9.65	15.9	
		11:01		CS-1N	North	45.4	1	Surface	1.65	0.18	7.17	9.74	16.0	
							22.7	Middle	1.87	-0.29	7.15	9.69	16.0	
							42.4	Deep	2.71	0.31	7.19	9.64	16.0	
		11:17		CS-2N	North	47.4	1	Surface	1.46	-0.01	7.14	9.76	16.0	
							23.7	Middle	1.75	-0.41	7.12	9.68	15.9	
							44.4	Deep	1.96	-0.44	7.18	9.65	15.9	

Water Quality Field Parameter Measurements
Gasco Sediments Site ISS Field Pilot Study

Circuit No.	Monitoring Date	Time	Flow Direction (Upriver/ Downriver)	Station	North/ South	Total Water Depth (feet)	Monitoring Depth (feet)	Depth Zone	Measured Turbidity (NTU)	Background Corrected Turbidity (NTU)[1]	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
3	10/3/2023	12:30	Downriver	BG-1S	South	36.0	1	Surface	1.56	--	7.21	9.81	16.0	
							18	Middle	2.23	--	7.18	9.72	15.9	
							33.0	Deep	2.39	--	7.20	9.68	15.9	
		12:55		EW-1N	North	43.6	1	Surface	1.73	0.17	7.22	9.76	15.9	
							21.8	Middle	1.95	-0.28	7.20	9.70	15.9	
							40.6	Deep	2.22	-0.17	7.20	9.65	15.9	
		13:07		CS-1N	North	42.8	1	Surface	1.54	-0.02	7.23	9.80	16.0	
							21.4	Middle	2.07	-0.16	7.22	9.69	15.9	
							39.8	Deep	2.92	0.53	7.18	9.64	15.8	
		13:16		CS-2N	North	45.2	1	Surface	1.93	0.37	7.21	9.78	16.0	
							22.6	Middle	2.95	0.72	7.15	9.67	15.8	
							42.2	Deep	3.05	0.66	7.15	9.65	15.8	
4	10/3/2023	14:51	Downriver	BG-1S	South	37.4	1	Surface	0.94	--	7.32	10.07	16.3	
							18.7	Middle	2.04	--	7.24	9.78	15.8	
							34.4	Deep	2.41	--	7.2	9.71	15.7	
		15:04		EW-1N	North	44.4	1	Surface	1.1	0.16	7.31	9.99	16.3	
							22.2	Middle	2.21	0.17	7.20	9.76	15.8	
							41.4	Deep	10.11	7.70	9.16	9.63	15.8	
		15:27		CS-1N	North	42.8	1	Surface	0.92	-0.02	7.28	10.04	16.5	
							21.4	Middle	1.83	-0.21	7.18	9.77	15.8	
							39.8	Deep	2.73	0.32	7.27	9.70	15.8	
		15:34		CS-2N	North	45.0	1	Surface	0.95	0.01	7.27	10.12	16.3	
							22.5	Middle	1.76	-0.28	7.16	9.79	15.8	
							42.0	Deep	7.76	5.35	9.39	9.60	15.8	
		16:25		CS-2N	North	45.0	1	Surface	1.18	0.24	7.34	10.03	16.3	
							22.5	Middle	1.99	-0.05	7.23	9.77	15.8	
							42.0	Deep	3.39	0.98	8.99	9.68	15.8	

Water Quality Field Parameter Measurements
Gasco Sediments Site ISS Field Pilot Study

Circuit No.	Monitoring Date	Time	Flow Direction (Upriver/ Downriver)	Station	North/ South	Total Water Depth (feet)	Monitoring Depth (feet)	Depth Zone	Measured Turbidity (NTU)	Background Corrected Turbidity (NTU)[1]	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
5	10/3/2023	16:51	Upriver	BG-1N	North	41.4	1	Surface	1.03	--	7.37	10.13	16.6	
							20.7	Middle	1.93	--	7.32	9.78	15.8	
							38.4	Deep	2.79	--	8.21	9.7	15.8	
		17:02		EW-1S	South	43.0	1	Surface	0.82	-0.21	7.28	10.17	16.5	
							21.5	Middle	1.8	-0.13	7.29	9.81	15.8	
							40	Deep	3.35	0.56	8.05	9.68	15.7	
		17:15		CS-1S	South	40.0	1	Surface	1.61	0.58	7.38	9.93	16.1	
							20	Middle	2.41	0.48	7.59	9.8	15.8	
							37	Deep	6.98	4.19	8.32	9.68	15.8	
		17:28		CS-2S	South	44.4	1	Surface	1.05	0.02	7.29	10.05	16.3	
							22.2	Middle	2.26	0.33	7.38	9.77	15.8	
							41.4	Deep	2.77	-0.02	8.28	9.67	15.8	
1	10/4/2023	7:50	Upriver	BG-1N	North	43.0	1	Surface	1.48	--	7.22	9.83	15.7	
							21.5	Middle	1.84	--	7.24	9.77	15.7	
							40.0	Deep	2.15	--	7.23	9.71	15.7	
		8:13		EW-1S	South	42.4	1	Surface	1.51	0.03	7.18	9.85	15.7	
							21.2	Middle	1.98	0.14	7.29	9.77	15.7	
							39.4	Deep	5.51	3.36	7.74	9.72	15.7	
		8:22		CS-1S	South	39.6	1	Surface	1.55	0.07	7.28	9.8	15.7	
							19.8	Middle	3.08	1.24	7.39	9.75	15.7	
							36.6	Deep	2.74	0.59	7.39	9.73	15.7	
		8:33		CS-2S	South	45.8	1	Surface	1.47	-0.01	7.23	9.85	15.7	
							22.9	Middle	1.58	-0.26	7.22	9.78	15.7	
							42.8	Deep	1.76	-0.39	7.36	9.69	15.7	

Water Quality Field Parameter Measurements
Gasco Sediments Site ISS Field Pilot Study

Circuit No.	Monitoring Date	Time	Flow Direction (Upriver/ Downriver)	Station	North/ South	Total Water Depth (feet)	Monitoring Depth (feet)	Depth Zone	Measured Turbidity (NTU)	Background Corrected Turbidity (NTU)[1]	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
2	10/4/2023	9:50	Downriver	BG-1S	South	39.0	1	Surface	1.2	--	7.37	9.98	15.8	
							19.5	Middle	1.46	--	7.34	9.85	15.7	
							36.0	Deep	1.68	--	7.36	9.8	15.7	
		10:05		EW-1N	North	43.4	1	Surface	1.35	0.15	7.35	9.87	15.8	
							21.7	Middle	1.62	0.16	7.33	9.77	15.8	
							40.4	Deep	1.84	0.16	7.56	9.76	15.7	
		10:20		CS-1N	North	43.6	1	Surface	1.12	-0.08	7.32	9.93	15.8	
							21.8	Middle	1.66	0.20	7.29	9.81	15.7	
							40.6	Deep	1.98	0.30	7.7	9.77	15.8	
		10:34		CS-2N	North	46.4	1	Surface	1.28	0.08	7.27	9.94	15.8	
							23.2	Middle	1.80	0.34	7.28	9.8	15.7	
							43.4	Deep	1.96	0.28	7.34	9.76	15.7	
3	10/4/2023	11:50	Downriver	BG-1S	South	40.6	1	Surface	1.42	--	7.3	10.00	15.9	
							20.3	Middle	1.64	--	7.3	9.89	15.8	
							37.6	Deep	1.74	--	7.28	9.84	15.8	
		12:06		EW-1N	North	45.8	1	Surface	1.36	-0.06	7.32	10.03	15.9	
							22.9	Middle	1.56	-0.08	7.28	9.88	15.8	
							42.8	Deep	1.77	0.03	7.29	9.83	15.8	
		12:17		CS-1N	North	43.0	1	Surface	1.51	0.09	7.28	9.95	15.8	
							21.5	Middle	1.73	0.09	7.29	9.87	15.8	
							40	Deep	1.85	0.11	7.27	9.83	15.8	
		12:26		CS-2N	North	46.8	1	Surface	1.53	0.11	7.28	9.95	15.8	
							23.4	Middle	2.05	0.41	7.28	9.83	15.8	
							43.8	Deep	2.03	0.29	7.3	9.80	15.8	

Water Quality Field Parameter Measurements
Gasco Sediments Site ISS Field Pilot Study

Circuit No.	Monitoring Date	Time	Flow Direction (Upriver/ Downriver)	Station	North/ South	Total Water Depth (feet)	Monitoring Depth (feet)	Depth Zone	Measured Turbidity (NTU)	Background Corrected Turbidity (NTU)[1]	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
4	10/4/2023	13:19	Downriver	BG-1S	South	41.4	1	Surface	1.73	--	7.34	9.92	15.8	
							20.7	Middle	1.98	--	7.33	9.89	15.8	
							38.4	Deep	2.11	--	7.31	9.83	15.8	X
		13:45		EW-1N	North	45.4	1	Surface	1.64	-0.09	7.32	9.97	15.8	
							22.7	Middle	1.87	-0.11	7.31	9.85	15.8	
							42.4	Deep	2.39	0.28	7.35	9.79	15.7	
		13:53		CS-1N	North	44.2	1	Surface	1.66	-0.07	7.31	9.96	15.8	
							22.1	Middle	2.03	0.05	7.28	9.86	15.8	
							41.2	Deep	2.07	-0.04	7.31	9.79	15.7	
		14:04		CS-2N	North	46.6	1	Surface	1.58	-0.15	7.30	9.97	15.8	
							23.3	Middle	1.75	-0.23	7.24	9.86	15.7	
							43.6	Deep	2.18	0.07	7.32	9.80	15.7	X

Notes:

--: not applicable

1. The background corrected turbidity is calculated by subtracting the measured turbidity at each of the non-background stations (i.e., EW, CS-1, and CS-2) from the background station.

BG: background

DO: dissolved oxygen

CS: compliance station

EW: early warning

mg/L: milligram per liter

NTU: nephelometric turbidity unit

Attachment 6
Moon Pool Informational Measurements

ANCHOR QEA

Moonpool Informational Measurements

Gasco Sediments Site ISS Field Pilot Study

6720 South Macadam Avenue, Suite 300
Portland, OR 97219

ISS Column Location	Date	Time	Pre-/Post-Measurement	Water Column Thickness (feet)	Measurement Depth (feet below surface)	pH	Temperature (°C)
* 1-1	9-23-23	7:34	PRE	13.6	9.6	7.25	19.5
1-2	9-25-23	7:15	PRE	12.	1	7.14	19.1
1-2	↓	7:17	↓	↓	6	7.10	19.1
1-2	↓	7:19	↓	↓	8	7.10	19.1
1-2	↓	9:45	POST	12	1	6.93	19.3
1-2	↓	9:47	↓	↓	6	7.23	19.3
1-2	↓	9:49	↓	↓	8	7.73	19.2
1-4	9-26-23	14:50	PRE	13	1	7.12	18.8
1-4	↓	14:52	↓	↓	6	7.31	18.4
1-4	↓	14:55	↓	↓	10	7.30	18.4
1-4	↓	18:30	POST	13	1	7.16	18.3
1-4	↓	18:32	↓	↓	5	7.54	18.3
1-4	↓	18:35	↓	↓	10	7.50	18.2
1-6	9-27-23	06:51	PRE	14	1	7.12	16.9
1-6	↓	06:53	↓	↓	7	7.23	16.2
1-6	↓	06:55	↓	↓	11	7.44	16.5
1-6	9-27-23	09:38	POST	~~14~~ 13	1	7.11	17.8
1-6	↓	09:40	↓	↓	7	7.24	17.5
1-6	↓	09:42	↓	↓	10	7.25	16.6
2-1	9-28-23	10:38	PRE	13	1	6.95	20.8
2-1	↓	10:41	↓	↓	6	7.16	21.

Notes:

*= Parameters collect @ beginning of mixing.

ANCHOR QEA

Moonpool Informational Measurements

Gasco Sediments Site ISS Field Pilot Study

6720 South Macadam Avenue, Suite 300
Portland, OR 97219

ISS Column Location	Date	Time	Pre-/Post-Measurement	Water Column Thickness (feet)	Measurement Depth (feet below surface)	pH	Temperature (°C)
2-1	9-28-23	10:43	PRE	13	10	7.37	21.
2-1	9-28-23	12:00	POST	13	1	7.04	19.8
2-1	↓	12:03	↓	↓	6	7.16	19.9
2-1	↓	12:06	↓	↓	10	7.51	19.5
2-6	9-29-23	07:45	PRE	14	1	7.03	17.
2-6	↓	07:47	↓	↓	7	7.36	16.2
2-6	↓	07:49	↓	↓	11	7.78	16.1
2-6	9-29-23	09:12	POST	14	1	7.20	16.7
2-6	↓	09:20	↓	↓	7	7.56	17.
2-6	↓	09:25	↓	↓	11	7.65	17.
3-1	10-2-2023	07:17	PRE	15	1	7.06	16.5
3-1	↓	07:19	↓	↓	7	7.27	15.5
3-1	↓	07:22	↓	↓	12	7.36	15.5
3-1	10-2-2023	08:10	POST	14.5	1	7.17	15.5
3-1	↓	08:12	↓	↓	6	7.47	15.5
3-1	↓	08:15	↓	↓	11	7.56	15.8
6-9	10-3-2023	~~06:57~~ 07:11	PRE	16	1	6.98	16.5
6-9	↓	07:14	↓	↓	6	7.22	16.2
6-9	↓	07:19	↓	↓	13	7.29	16.0
6-9	10-3-2023	08:01	MID[1]	16	1	7.26	16.0
6-9	↓	08:05	↓	↓	6	7.71	16.0

Notes:

1 = Measurements collected after drill rod retracted from sediment before final drill depth was achieved. Collected "Post" drilling/mixing measurements as well.

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Moonpool Informational Measurements
Gasco Sediments Site ISS Field Pilot Study

6720 South Macadam Avenue, Suite 300
Portland, OR 97219

ISS Column Location	Date	Time	Pre-/Post-Measurement	Water Column Thickness (feet)	Measurement Depth (feet below surface)	pH	Temperature (°C)
6-9	10-3-2023	08:09	MID	16	13	7.72	16.0
6-9	10-3-2023	09:08	POST	17	1	7.26	15.6
6-9	↓	09:11	↓	17	7	7.58	15.6
6-9	↓	09:14	↓	17	14	7.64	15.8
7-9	10-4-2023	06:38	PRE	14	1	6.95	15.4
7-9	↓	06:42	↓	↓	7	7.28	15.4
7-9	↓	06:45	↓	↓	11	7.46	15.5
7-9	↓	07:39	POST	14	1	7.64	15.1
7-9	↓	07:42	↓	↓	7	7.66	15.4
7-9	↓	07:46	↓	↓	11	7.61	15.5

Notes: