

# Weekly Summary Report

<b>Project Name:</b>	Gasco Sediments Site ISS Field Pilot Study		
<b>Project No:</b>	000029-02.85	<b>Report Date:</b>	October 17, 2023
<b>Week of:</b>	October 9, 2023	<b>Report No:</b>	5

Weekly Summary			
Item	Approximate Production This Week	Approximate Total Cumulative Production	Approximate Task Percent Completion
Mobilization activities	NA	NA	100%
Dolphin pile removal	NA	NA	100%
Debris removal	6 cy	16 cy	100%
ISS auguring	26 columns	42 columns	>100% <sup>1</sup>
Swell material removal	0	0	0%

Note:

1. The task percent complete for ISS auguring is based on the Work Plan-identified goal of 29 columns.

Work Performed This Period
<p><u>Monday (10/09/2023)</u></p> <p>Performed in situ stabilization and solidification (ISS) auguring and ISS quality assurance/quality control (QA/QC) sample collection at columns 8-1 and 8-3. Refusal was encountered at column 8-3.</p>
<p><u>Tuesday (10/10/2023)</u></p> <p>Performed ISS auguring and ISS QA/QC sample collection at column 8-2.</p>
<p><u>Wednesday (10/11/2023)</u></p> <p>Performed maintenance on fuel systems for Bauer BG 28 H drill rig. Performed targeted debris removal near column 4-1.</p>
<p><u>Thursday (10/12/2023)</u></p> <p>Continued and completed maintenance on Bauer BG 28 H drill rig. Performed ISS auguring and ISS QA/QC sample collection at column 8-10. Refusal was encountered.</p>

Friday (10/13/2023)

Performed ISS auguring and ISS QA/QC sample collection at columns 8-9, 8-11, 3-10, 1-11, and 2-11. Refusal was encountered at columns 8-9 and 8-11.

Saturday (10/14/2023)

Performed ISS auguring and ISS QA/QC sample collection at columns 6-11, 7-4, 1-5, and 1-12. Refusal was encountered at columns 7-4 and 1-5.

**Water Quality Monitoring**

Monday (10/09/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring, and no turbidity plumes, sheens, or odors were observed. Two rounds of flood tide water quality monitoring were performed during ISS auguring activities, with field and chemical parameters collected at background station NWN-BG1N and compliance station NWN-CS1S. 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 (10/10/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring, and no turbidity plumes, sheens, or odors were observed. One round of water quality monitoring was performed during ebb tide 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 (10/11/2023)

Performed visual inspection of river outside the outer containment barriers during debris removal activities, and no turbidity plumes, sheens, or odors were observed. One round of water quality monitoring was performed during ebb tide during debris removal activities, with field and chemical parameters collected at background station NWN-BG1S and compliance station NWN-CS1N. 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 (10/12/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring, and no turbidity plumes, sheens, or odors were observed. One round of water quality monitoring was performed during ebb tide during ISS auguring activities, with field and chemical parameters collected at background station NWN-BG1S and compliance station 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.

Friday (10/13/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring, and no turbidity plumes, sheens, or odors were observed. Five rounds of water quality monitoring were performed (three during ebb tide and two during flood tide) 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.

Saturday (10/14/2023)

Performed visual inspection of river outside the outer containment barriers during ISS auguring, and no turbidity plumes, sheens, or odors were observed. Two rounds of water quality monitoring were performed during ebb tide during ISS auguring activities, with field and chemical parameters collected at background station NWN-BG1S and compliance station NWN-CS2N during the second round. 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.

Findings:

There was an exceedance of two field parameters at compliance station CS-2N at a single depth during the first round of monitoring on Friday, October 13, 2023 (out of five rounds of monitoring). Confirmed turbidity was measured at 10.40 nephelometric turbidity units (NTU), which was 7.94 NTU above the standard (based on 5 NTU over background, which was 2.46 NTU). The pH reading was 9.22, 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 the U.S. Environmental Protection Agency (EPA), best management practice adjustments during ISS auguring will include consideration of pause time between ISS column locations and the proportion of the total grout dose injected in the downstroke and upstroke (e.g., 60% down and 40% up). Monitoring will continue under the intensive chemistry monitoring routine.

The result for benzo(a)pyrene was slightly higher than the chronic water quality criterion at both the background and compliance stations during round 1 on Tuesday, October 3, 2023. The 2-day average (October 3 and October 4) concentrations for both the background and compliance stations were below the chronic criterion. The result for benzo(a)pyrene was higher than the chronic water quality criterion at the compliance station during round 1 on Monday, October 9, 2023. The 1-day average concentration for the compliance station calculated across rounds 1 and 2 was below the chronic criterion.

A compilation of water quality daily field forms from the week (Attachments 1 through 4), tabulated field parameter data (Attachment 5), and tabulated chemistry data (Attachment 6) 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*,<sup>1</sup> for informational purposes only, pH and temperature samples were collected from the moonpool prior to initiation of ISS auguring and following completion of ISS auguring and prior to raising the moonpool curtain. These informational moonpool measurements are included in Attachment 7.

<sup>1</sup> 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.

**Scheduled Construction Work This Week (Next Reporting Week)**

Continue ISS auguring operations, ISS QA/QC sample collection, and swell material surveying and focused removal to facilitate installation of the long-term monitoring ports (if applicable), and tracking.

**Problems Encountered and Contingency Actions Implemented**

Due to the presence of encountered subsurface debris during ISS auguring at columns 1-5, 7-4, 8-3, 8-9, 8-10, and 8-11, ISS treatment was extended to 20.3, 5.2, 21.3, 24.0, 24.7, and 12.4 feet below mudline, respectively, relative to the target 30-foot depth of contamination.

NW Natural submitted Field Change Request Form #3 on October 9, 2023, requesting EPA approval associated with placement of clean cover material within the field pilot study footprint and management of swell material downslope from the field pilot study footprint.

Due to some uncertainty about how to interpret the applicability of a running intensive monitoring period following a field parameter exceedance, the first round of water quality monitoring on Saturday, October 14, 2023, did not include collection of samples for chemical analysis. After further discussion, samples for chemical analysis were collected during the second round and will be collected every other day until a week has passed without any additional triggering event for intensive monitoring (or until cessation of activities requiring water quality monitoring). EPA was notified of this issue on Saturday, October 14, 2023, and NW Natural requested EPA's clarification on the interpretation of the 404 ARARs Memorandum.

<b>Prepared by:</b>	Kendra Skellenger	<b>Contact Information:</b>	503-752-4218 kskellenger@anchorqea.com
<b>cc:</b>	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		
<b>Attachments:</b>	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	Water Quality Chemical Parameter Measurements	
	Attachment 7	Moonpool Informational Measurements	

# Photographs

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**Photograph 1**



ISS QA/QC sample team processing the top, middle, and bottom intervals for column 8-3 (10/09/2023).

**Photograph 2**



Overhead view of the ISS Field Pilot Study. Environmental controls in-place (10/10/2023).

**Photograph 3**



Overhead view of the ISS Field Pilot Study (10/10/2023).

**Photograph 4**



Excavator on swell material barge removing debris near column 4-1 (10/11/2023).



**Photograph 5**



Performing ISS auguring at column 8-10. Refusal was encountered at 24.5 feet below ground surface (10/12/2023).

**Photograph 6**



Moving discrete-depth sampler around Bauer BG 28 H drill rig (10/13/2023).

# Attachment 1

## Daily Monitoring Logs

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## Daily Monitoring Log

### Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-9-2023  
 Personnel: Simon Dudenhoefes

Wind from: 

N	NE	E	SE	<b>S</b>	SW	W	NW	NONE	<b>LIGHT</b>	MEDIUM	HEAVY
SUNNY		<b>CLOUDY</b>		RAIN							

 Temperature: 59 °F    °C  
(Circle appropriate units)

Time	Comments
0745	Arrive @ Gasco Trailer → print field forms / Calibrate YSDs
0850	Drive boat from Gasco → Cathedral Park boat ramp
0930	H/S meeting: thunder protocol while working on water, slips trips + falls entering/exiting boat, evacuation plan, PPE always.
—	Today's tides: Low @ 1029, High @ 1538, Low @ 2118
—	Today's Will. River Water Quality (USGS): Temp: 16.4°C, pH: 7.4, DO: 9.9%, Turb: 1.4 FTU
0949	Light rain began
1010	Jim (Clearwater) arrive @ Gasco Trailer (escorted by me)
1020	ON WATER → Set 500' BG stations in Garmin GPS
1100	OFF WATER
1103	Start ISS Drilling → WQM Circuit #2 (flood tide) start @ 1203
1155	ON WATER → To BG-1N (500' new location) to start WQM C#2
—	↳ unable to access BG-1N first due to centerline boating
—	moving into dock, headed to EW-1S to start WQM C#2
1203	@ EW-1S, confirmed 100' boom distance w/ range finder
—	Confirmed Garmin depth reading w/ lead line
—	Confirmed river flow direction visually + w/ velocimeter and USGS Willamette River Morrison Bridge gauge.
1221	@ CS-1S, confirmed 150' boom dist. w/ range finder
1232	@ CS-2S, " "
1240	Decon Van Dorn → collecting chum sample @ CS-1S (highest CS NW)
1250	Collected NWN-CS1S-2310091250 @ CS-1S @ 37.4'
1255	Decon Van Dorn sampler
1257	@ BG-1N, confirmed new locations 500' dist. w/ range finder
—	constant tug/barge movement in channel today
1315	Collected NWN-BG1N-2310091315 @ BG-1N @ 42.6'
—	Finish WQM C#1 → NO EXCEEDANCES → C#2 @ 1403
1320	OFF WATER
1355	ON WATER
1403	@ BG-1N, confirmed 500' boom dist (new location) w/ range finder

Signature:

### Daily Monitoring Log Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-9-2023

Personnel: Simon Dudenhofer

Wind from: N NE E SE (S) SW W NW NONE LIGHT (MEDIUM) HEAVY  
 SUNNY (CLOUDY) (RAIN) Temperature: 58 °C  
(Circle appropriate units)

Time	Comments
1414	@EW-15, confirmed 100' boom distance w/ range finder
1425	@CS-15, " " 150' "
1432	@CS-25, " "
1440	Decon van Dorn sampler
1445	Collected <del>NWN</del> NWN-CS15-2310091445 @CS-15 @ 18.4'
1450	Decon van Dorn sampler
1500	Collected NWN-BGIN-2310091500 @BGIN @ 23.7'
-	Finish WQM C#2 → NO EXCEEDANCES → DONE DRILLING
1510	OFF WATER

Signature:

## Daily Monitoring Log

### Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-10-2023

Personnel: Simon Dudenhoefer

Wind from:	N	NE	E	<u>SE</u>	S	SW	W	NW	NONE	LIGHT	<u>MEDIUM</u>	HEAVY
	SUNNY		<u>CLOUDY</u>		<u>RAIN</u>						Temperature: <u>53</u> °C	

(Circle appropriate units)

Time	Comments
0605	Arrive @ Gasco Trailer, calibrate YSIS, upload COCs
---	DAY 3 of intensive monitoring → no chemistry samples today
0715	H/S Meeting: High winds projected in forecast + potential thunderstorms, Likely dealing w/ large waves while on the WQM boat → off water if thunder is heard, Exit water if waves pose risk to safety of WQM team, PFDS, wet surface slips
---	TIDES (NOAA): Low @ 1104, High @ <del>1604</del> 1604, Low @ 2238
---	Willamette River WQ (USGS): Temp: 16.5°C, pH: 7.4, DO: 9.8 mg/L, Turb: 1.7 FNU
---	Once drilling starts, will start WQM Circuit #2 @ Ebb tide locations, one hour after drill start time
---	Background monitoring stations will remain @ 300' from boom @ GPS coordinates provided @ beginning of project.
0830	ISS Drill Start time → WQM Circuit #2 (Ebb tide) start @ 0930
0915	ON WATER → TO BG-1S (river flowing downstream, confirmed visually + w/ velocimeter + USGS Morrison Gauge)
0930	@ BG-1S, confirmed 300' boom distance w/ range finder
---	Confirmed Garmin depth reading w/ lead line
0940	@ EW-1N, confirmed 100' boom distance w/ range finder
0950	@ CS-1N, " " 150' " "
1002	@ CS-2N, " " " "
1015	Finish WQM Circuit #2 - NO EXCEEDANCES
---	Drill having mechanical issues drilling on pause
---	NO MORE WQM UNTIL DRILLING STARTS UP AGAIN
1030	OFF WATER

Signature: \_\_\_\_\_

## Daily Monitoring Log

### Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-11-2023

Personnel: LAFFOON / Fuller

Wind from:	N	NE	E	SE	<input checked="" type="radio"/> S	SW	W	NW	NONE	LIGHT	<input checked="" type="radio"/> MEDIUM	HEAVY
	SUNNY		CLOUDY		<input checked="" type="radio"/> RAIN				Temperature: <input checked="" type="radio"/> 53 °C		[Circle appropriate units]	

Time	Comments
0545	Arrive at site
0600	Attend morning meeting @ SES trailer
0635	Received call from Simon Dudenhofer, involved in auto accident on Hwy 30. He is OK but will be late or may not come in today. I took over WQM duties. Calibrate YSI's
—	Will take chemistry samples today. No column installation today, drilling rig is in need of repair. Switching out hoses to clean up, flatten area to check even shored area for rip rap / rocks
0832	D debris removal with bucket start time. WQM brief at Background station BG 1 S
0943	Completed Circuit #1 and collected Chemical Parameters samples. Unload boat / off water
1026	Sample taken to APEX Labs, forms scanned to Fuji. off water until further notice (drill rig in need of repair).

Signature: [Handwritten Signature]

## Daily Monitoring Log

### Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-12-2023

Personnel: Simon Dutenhoefer

Wind from: 

N	<input checked="" type="radio"/> NE	E	SE	S	SW	W	NW	NONE	<input checked="" type="radio"/> LIGHT	MEDIUM	HEAVY
SUNNY		<input checked="" type="radio"/> CLOUDY		RAIN				Temperature: <input checked="" type="text" value="56"/> °C			

[Circle appropriate units]

Time	Comments
1005	Arrive @ Gasco Trailer → prep field forms → Calibrate YSI
1050	H/S meeting w/ boat crew: PFDs, throwables, man overboard response actions, slips/trips/falls on dock + entering/exiting boat
—	Tides (NOAA): Low @ 1200 (0.27 ft), High @ 1645 (2.84 ft)
—	Water Quality (USGS Willamette River Morrison Bridge Gauge - 1000)
—	Temp: 16.7°C, pH: 7.4, DO: 9.4 mg/L, Turbidity: 2.0 FNU
1140	ON WATER → To Fred's Marina to get gas for boat
12:5	Back @ Gasco Dock → OFF WATER
1720	Start ISS Drilling → WQM Circuit #1 start earlier today (30 min) due to time → start @ 1750 @ BG-1S
—	WQM Circuit #1 during ebb tide, river flowing downstream, visually confirmed + w/ Morrison Gauge (USGS) + velocimeter
1730	ON WATER → TO BG-1S
1740	@ BG-1S, confirmed 300' boom distance w/ range finder
—	Confirmed Garmin depth reading w/ lead line
—	Waiting until 1750 to begin parameter WQM
1750	start WQM Circuit #1 (ebb tide)
—	Decontaminate Van Dorn sampler w/ alconox + DI water
1800	@ EW-1N, confirmed 100' boom distance w/ range finder
1809	@ CS-1N, " " 150' "
1816	@ CS-2N, " " "
1825	Collected NWN-CS2N-2310121825 @ CS-2N @ 47.6'
1830	Decog Van Dorn sampler
1835	Collected NWN-BG1S-2310121835 @ BG-1S @ 41.2'
—	Finish WQM #2 → NO EXCEEDANCES
—	↳ pH high @ CS-2N, not @ EW-1N
1845	OFF WATER → ISS Drilling activities complete for the day

Signature:

## Daily Monitoring Log Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-13-2023  
Personnel: Simon Dudenhofer

Wind from: 

N	NE	<u>E</u>	SE	S	SW	W	NW	NONE	<u>LIGHT</u>	MEDIUM	HEAVY
SUNNY		<u>CLOUDY</u>	RAIN								

 Temperature: 65.7 °C  
(Circle appropriate units)

Time	Comments
0630	Arrive @ Gasco Trailer → Calibrate VSI #6970, print field forms, prep parameter spreadsheet
0700	ISS Drilling start time → start WQM Circuit #2 @ 0800
	NO WQM SAMPLES TODAY FOR ISS DRILLING ACTIVITY
	TIDES: 0450 High (2.58'), 1221-Low (0.28), 1710-High (3.02)
	Water Quality (USGS): Temp: 16.6°C, pH: 7.4, DO: 9.8 mg/L, Turb: 2.0 FNU
	WQM Circuit #2 will start during ebb tide @ BG-15
	H/S meeting: boat safety gear locations: throwable, AED, horn, walkie, first aid, backup motor - slips trips falls on dock
0745	ON WATER → TO BG-15
0800	@ BG-15, confirmed 300' boom distance w/ range finder
	Confirmed river flow direction (downstream) visually, w/ velocimeter, and USGS Willamette River Morrison Bridge Gauge
	Confirmed Garmin depth reading w/ lead line
0814	@ EW-1N, confirmed 100' boom distance w/ range finder
0830	@ CS-1N, " " 150' " "
0838	@ CS-2N, " " " "
0845	@ CS-2N @ 43.8' - pH and turbidity parameters in exceedance
	↳ pH: 9.25 ↳ Turbidity: 12.36
	Called James, collected 2nd measurements @ 0852 to confirm exceedance
	Finish WQM #2 → reported exceedance to Ryan Barth
0900	OFF WATER → WQM Circuit #2 (ebb) start @ 1000
0955	ON WATER → start WQM Circuit #2 (ebb tide)
1000	@ BG-15, confirmed 300' boom distance w/ range finder
1009	@ EW-1N, " " 100' " "
1016	@ CS-1N, " " 150' " "
	<del>Drilling start again</del> SP
1025	@ CS-2N, confirmed 150' boom distance w/ range finder
1030	start drilling next hole → Finish WQM #2, no exceedances
	Finish WQM Circuit #2 → NO EXCEEDANCES → #3 @ 1200

Signature:



## Daily Monitoring Log

### Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-13-2023  
 Personnel: Simon Dudenhofer

Wind from: 

N	NE	E	<b>SE</b>	S	SW	W	NW	NONE
<del>SUNNY</del>	<del>CLOUDY</del>			RAIN				

 Temperature: **(F) 65** °C  
[Circle appropriate units]

Time	Comments
<del>1100</del>	OFF WATER → start WQM circuit #3 (ebb) @ 1200
1145	ON WATER → TO BG-1S for WQM C#3
1200	@ BG-1S, confirmed 300' boom distance w/ range finder
1210	OFF WATER → LUNCH BREAK
1240	ON WATER → TO EW-1N (river flow still downstream, confirmed visually + w/ velocimeter)
1250	@ EW-1N, confirmed 100' boom distance w/ range finder
1300	@ CS-1N, " " 150' "
1310	@ CS-2N, " " " "
1315	Complete WQM Circuit #3, NO EXCEEDANCES → WQM C#4 @ 1400
1320	OFF WATER
1350	ON WATER → TO BG-1N (tide coming in, confirmed visually + w/ live tidal water + USGS Morrison Bridge Gauge)
1400	@ BG-1N, confirmed 300' boom distance w/ range finder
1415	@ EW-1S, " " 100' "
1425	@ CS-1S, " " 150' "
1433	@ CS-2S, " " "
1445	Finish WQM Circuit #4, NO EXCEEDANCES
1450	OFF WATER → WQM Circuit #5 start time @ 1600
1555	ON WATER → TO BG-1N to start WQM Circuit #5
1600	@ BG-1N, confirmed 300' boom distance w/ range finder
1613	@ EW-1S, " " 100' "
1622	@ CS-1N, " " 150' "
1631	@ CS-2N, " " "
1645	Finish WQM Circuit #5 → NO EXCEEDANCES
	ISS Drilling activities complete, no further WQM
1655	OFF WATER

Signature:

## Daily Monitoring Log Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-14-2023

Personnel: Simon Dudenhofer

Wind from:	N	NE	E	SE	<input checked="" type="radio"/>	SW	W	NW	NONE	<input checked="" type="radio"/>	MEDIUM	HEAVY
	SUNNY		<input checked="" type="radio"/>		RAIN							

Temperature:  53 °C  
(Circle appropriate units)

Time	Comments
0625	Arrive @ Gasco Trailer → prep coolers, print forms, calibrate YSI #6970
0700	H/S: entering/exiting boat, PFDs overhead hazards on work barge, safely collecting samples over site of WQM boat
0730	ISS Drill Start time → WQM Circuit #1 start @ 0830
0745	TIDES: 0528 - High (2.52), 1242 - Low (0.31), 1738 - High (3.31) ↳ WQM Circuit #2 start @ BG-15 (ebb tide), downstream flow
	USGS Morrison Gauge Water Quality: Temp: 16.1°C, pH: 7.4, DO: 10.2% Turb: 2
	NO CHEMISTRY SAMPLES TODAY → Due to pH + Turbidity exceedance yesterday, intensive monitoring schedule resets. Today is day 1, will collect chemistry → sampling samples on Day 2 of FSS
	Drilling (most likely Monday, Oct. 16)
0800	ON WATER → Check stations access due to swell barge relocation
0830	@ BG-15 → start w QM Circuit #1 (ebb tide)
	River flow direction (downstream) confirmed w/ visual observations, velocimeters, and USGS Morrison gauge data
	Confirmed Garmin depth reading w/ lead line
	Confirmed BG-15 300' boom distance w/ range finder
0850	@ EW-1N " " 100' "
0902	@ CS-1N " " 150' "
0911	@ CS-2N "
0918	Finish WQM Circuit #1 - NO EXCEEDANCES OBSERVED start WQM Circuit #2 (ebb) @ 1030
0920	OFF WATER
1020	ON WATER → To BG-15 to start WQM Circuit #2 (ebb) @ 1030
1030	@ BG-15, confirmed 300' boom distance w/ range finder
1037	@ EW-1N, " " 100' "
1052	@ CS-1N " " 150' "
1103	@ CS-2N "
	Ryan called during this round to inform us to collect chemistry samples

Signature: \_\_\_\_\_

↳ Cont.

## Daily Monitoring Log Gasco Sediments Site ISS Pilot Study



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

Phone 503.670.1108

Date: 10-14-2023  
Personnel: Simon Dudenhofer

Wind from:	N	NE	E	SE	S	SW	W	NW	NONE	LIGHT	MEDIUM	HEAVY	Temperature: *F *C <small>(Circle appropriate units)</small>
	SUNNY	CLOUDY	RAIN										

Time	Comments
CONT →	@ the CS w/ highest NTU + BG station @ all depth intervals
1140	Decon Van Dorn sampler
1145	Collected NWN-CS2N-2310141145 @ CS-2N @ 1'
—	Decon Van Dorn
1150	collected NWN-CS2N-2310141150 @ CS-2N @ 23.5'
—	Decon Van Dorn
1155	Collected NWN-CS2N-2310141155 @ CS-2N @ 44'
—	Decon Van Dorn
1205	Collected BG NWN-BG15-2310141205 @ BG-15 @ 1'
—	Decon Van Dorn
1210	Collected NWN-BG15-2310141210 @ BG-15 @ 19.5'
—	Decon Van Dorn
1215	collected NWN-BG15-2310141215 @ BG-15 @ 36' and
—	collected QC field duplicate sample NWN-BG15-2310141215
—	Finish WQM Circuit #2 → NO EXCEEDANCES
1230	ISS Drilling activities complete → No further WQM
1405	Drop samples @ APEX LABS

Signature:

## Attachment 2

# Water Quality Monitoring Calibration Logs

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

Date: 10-9-2023  
Probe S/N: 21E103678

Calibrated By: Simon Dudenhofer  
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	36G0021	07/25	7.08	7.05	14.7	A standard for temp
pH 4.00 (Standard Units)	4.00	36F1085	06/25	3.97	4.00	15.0	
Dissolved Oxygen (DO) <sup>1</sup>	99.0	NA	NA	99.3	99.0	18.2	AIR
Turbidity (NTU) <sup>1</sup>	0	NA	NA	0.43	0.00	15.9	DI WATER
Turbidity (NTU) <sup>1</sup>	124	23F24003426	06/24	124.20	124.01	15.9	

Date: 10-9-2023  
Probe S/N: \_\_\_\_\_

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

Parameter	Calibration Standard	Standard Lot No.	Expiration Date	Initial Calibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.04	36G0021	07/25	6.97	7.04	15.1	A standard for temp
pH 4.00 (Standard Units)	4.00	36F1085	06/25	3.81	4.00	15.6	
Dissolved Oxygen (DO) <sup>1</sup>	99.0	NA	NA	98.8	99.0	18.3	AIR
Turbidity (NTU) <sup>1</sup>	0	NA	NA	0.63	0.00	16.1	DI WATER
Turbidity (NTU) <sup>1</sup>	124	23F24003426	06/24	123.60	124.00	16.1	

Notes:

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

### Water Quality Monitoring – Calibration Log Form

#### Gasco Sediments Site ISS Pilot Study

Date: 10-10-2023  
 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)	7.06	36G0021	07/25	7.03	7.06	12.5	Δ standard value for temp
pH 4.00 (Standard Units)	4.00	36F1085	06/25	4.00	4.00	13.0	
Dissolved Oxygen (DO) <sup>1</sup>	98.5	NA	NA	98.4	98.5	18.7	AIR
Turbidity (NTU) <sup>1</sup>	0	NA	NA	0.03	0.00	12.9	DZ WATER
Turbidity (NTU) <sup>1</sup>	124	23F24003426	06/24	122.89	123.95	12.9	

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) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>							

SD  
 YSI # 5006 NOT CALIBRATED OR USED

Note:

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



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

Date: 10-11-2023  
Probe S/N: 21E103678

Calibrated by: Doug Luffman  
Meter(s) Model: YSI Pro DSS #6970

Parameter	Calibration Standard	Standard Lot No.	Expiration Date	Initial Calibration	Final Calibration	Temperature	Comments
pH 7.00 (Standard Units)	7.00	3660021	7/25	7.06	7.06	12.4	$\Delta$ standard value for temp
pH 4.00 (Standard Units)	4.00	36F1085	6/25	3.99	4.00	12.5	
Dissolved Oxygen (DO) <sup>1</sup>	99.6	NA	NA	99.6	99.6	19.5	Air
Turbidity (NTU) <sup>1</sup>	0	NA	NA	0.22	0.00	12.5	DI water
Turbidity (NTU) <sup>1</sup>	124	23F24008126	5/24	127.07	124.03	12.9	

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				A		
Dissolved Oxygen (DO) <sup>1</sup>				N			
Turbidity (NTU) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>							

Note:

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

### Water Quality Monitoring – Calibration Log Form

#### Gasco Sediments Site ISS Pilot Study

Date: 10-12-2023  
Probe S/N: 21E103678

Calibrated by: Simon Dudenhofer  
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	7.07	7.05	13.8	Δ cal standard for temp.
pH 4.00 (Standard Units)	4.00	36F1085	06/25	3.94	4.00	13.5	
Dissolved Oxygen (DO) <sup>1</sup>	100.3	NA	NA	100.6	100.3	17.1	AIR
Turbidity (NTU) <sup>1</sup>	0	NA	NA	-0.30	0.00	14.1	DI WATER
Turbidity (NTU) <sup>1</sup>	12.4	23F24003426	06/24	123.78	123.98	14.1	

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) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>							

DID NOT CALIBRATE  
OR USE YSI #5006

Note:

- Calibration standards are entered by hand depending on the monitoring instrument being used.
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### Water Quality Monitoring – Calibration Log Form

#### Gasco Sediments Site ISS Pilot Study

Date: 10-13-2023  
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	36G0021	07/25	7.08	7.05	13.0	A standard for temp.
pH 4.00 (Standard Units)	4.00	36F1085	06/25	4.06	4.00	13.3	
Dissolved Oxygen (DO) <sup>1</sup>	99.3	NA	NA	99.7	99.3	17.6	AIR
Turbidity (NTU) <sup>1</sup>	0	NA	NA	0.10	0.00	13.5	DI WATER
Turbidity (NTU) <sup>1</sup>	124	23F24003635	06/24	124.18	123.91	13.5	

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) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>							
DID NOT CALIBRATE OR USE YSI #5006 SD							

Note:

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

### Water Quality Monitoring – Calibration Log Form

#### Gasco Sediments Site ISS Pilot Study

Date: 10-14-2023  
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)	7.06	3GG0021	07/25	7.03	7.06	12.1	Δ standard for temp.
pH 4.00 (Standard Units)	4.00	3GF1085	06/25	3.99	4.00	12.2	
Dissolved Oxygen (DO) <sup>1</sup>	100.0	NA	NA	99.8	100.0	17.4	AIR
Turbidity (NTU) <sup>1</sup>	0	NA	NA	-0.28	0.00	12.7	DI WATER
Turbidity (NTU) <sup>1</sup>	124	23F24003635	06/24	120.53	124.01	12.7	

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) <sup>1</sup>							
Turbidity (NTU) <sup>1</sup>		DID NOT USE / CALIBRATE		YSI #5006			SD
Turbidity (NTU) <sup>1</sup>							

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

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Attachment 3  
Water Quality Monitoring Forms –  
Field Parameters

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Probe # 21E103678

YSI ProDSS # 6970

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

Date: 10-9-2023      Circuit Number: 1

Station: BG EW CS-1 CS-2 N S      Time: ~~12035D~~ 1257

Flood / Ebb      Up River / Down River      Avg. Velocity: 0.386

Lat/Northing: 45.58076      Long/Easting: 122.75848      Total Water Depth: 45.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.16	7.03	9.88	16.2
Middle	22.8	1.21	7.10	9.87	16.1
Deep	42.6	1.64	7.11	9.79	16.1

Comments<sup>1</sup>: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 CS-2 N S      Time: 1203

Flood / Ebb      Up River / Down River      Avg. Velocity: 0.063

Lat/Northing: 45.57926      Long/Easting: 122.75498      Total Water Depth: 43

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.43	7.21	9.94	16.1
Middle	21.5	1.37	7.15	9.82	16.1
Deep	40	3.75	7.98	9.75	16.1

Comments<sup>1</sup>: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhofer

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

Probe # 21E103678

YSI ProSS # 6970

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

Date: 10-9-2023			Circuit Number: 1		
Station: BG EW <u>CS-1</u> CS-2 N <u>S</u>			Time: 1221		
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.398	
Lat/Northing: 45.57898		Long/Easting: 122.75457		Total Water Depth: 40.6	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.23	7.11	9.86	16.2
Middle	20.3	1.49	7.18	9.84	16.1
Deep	37.6	3.65	7.78	9.77	16.1
Comments <sup>1</sup> : • Minor sheen observed (ebullition); - not construction related • No odor, discoloration, or suspended material observed related to construction activities • collected chem. sample here @ 37.6' (highest CS NTU)					
Construction Activity: ISS Drilling					
Station: BG EW CS-1 <u>CS-2</u> N <u>S</u>			Time: 1232		
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.435	
Lat/Northing: 45.57957		Long/Easting: 122.75512		Total Water Depth: 46.4	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.26	7.04	9.88	16.1
Middle	23.2	1.33	7.08	9.83	16.1
Deep	43.4	2.17	7.14	9.80	16.1
Comments <sup>1</sup> : • <del>Minor sheen not related to construction observed</del> SD • No sheen, odor, discoloration observed • Lots of grass/plant debris in river channel today					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhofer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					

Probe # 21E103678

YSI ProDS #6970

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

Date: 10-9-2023			Circuit Number: 2		
Station: BG EW CS-1 CS-2 N S			Time: 1403		
Flood / Ebb		Up River / Down River		Avg. Velocity: 0.655	
Lat/Northing: 45.58077		Long/Easting: 122.75846		Total Water Depth: 47.2	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	0.87	7.17	9.94	16.2
Middle	23.6	1.42	7.15	9.88	16.2
Deep	44.2	1.49	7.16	9.84	16.2
Comments <sup>1</sup> : • No sheen, odor, discoloration, or suspended material observed					
Construction Activity: ISS Drilling					
Station: BG EW CS-1 CS-2 N S			Time: 1414		
Flood / Ebb		Up River / Down River		Avg. Velocity: 0.183	
Lat/Northing: 45.57917		Long/Easting: 122.75500		Total Water Depth: 42.4	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	2.16	7.32	9.90	16.2
Middle	21.2	2.35	7.38	9.86	16.2
Deep	39.4	2.49	7.52	9.83	16.2
Comments <sup>1</sup> : • No sheen, odor, discoloration, or suspended material observed					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhofer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					

Project # 21E103678

YSI ProDSS #6970

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

Date: 10-9-2023			Circuit Number: 2		
Station: BG EW <u>CS-1</u> CS-2 N <u>S</u>		Time: 1425			
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.266	
Lat/Northing: 45.57889		Long/Easting: 122.75462		Total Water Depth: 32	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.56	7.30	9.91	16.2
Middle	16	1.94	7.28	9.88	16.2
Deep	<del>29</del>	1.75	7.30	9.86	16.2
Comments: <ul style="list-style-type: none"> <li>• No sheen, odor, discoloration, or suspended material observed</li> <li>• Collecting Chemistry sample here @ middle depth (highest CS NTU)</li> </ul>					
Construction Activity: ISS Drilling					
Station: BG EW CS-1 <u>CS-2</u> N <u>S</u>		Time: 1432			
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.500	
Lat/Northing: 45.57957		Long/Easting: 122.75510		Total Water Depth: 47	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	0.94	7.19	9.96	16.2
Middle	23.5	1.18	7.15	9.89	16.2
Deep	44	1.17	7.17	9.84	16.2
Comments: <ul style="list-style-type: none"> <li>• No sheen, odor, discoloration, or suspended material observed</li> </ul>					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhofer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					

Probe # 21E103678

YSL ProDSS# 6970

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

Date: 10-10-2023      Circuit Number: 1

Station: **BG** EW CS-1 CS-2 N **S**      Time: 0930

Flood / **Ebb**      Up River / ~~Down River~~      Avg. Velocity: 0.405

Lat/Northing: 45.57875      Long/Easting: 122.75400      Total Water Depth: 39.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.25	7.17	9.89	16.0
Middle	19.7	1.43	7.21	9.86	16.0
Deep	36.4	1.32	7.22	9.83	16.0

Comments<sup>1</sup>: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: **BG** **EW** CS-1 CS-2 **N** S      Time: 0940

Flood / **Ebb**      Up River / ~~Down River~~      Avg. Velocity: 0.270

Lat/Northing: 45.58007      Long/Easting: 122.75695      Total Water Depth: 42.8

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.05	7.23	9.91	16.0
Middle	21.4	1.22	7.25	9.87	16.0
Deep	39.8	5.93	7.62	9.82	16.0

Comments<sup>1</sup>: • No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhofer

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



Probe # 21E103678 YSI ProDSS # 6970

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

Date: 10-10-2023 Circuit Number: 1

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

Flood (Ebb) Up River / Down River Avg. Velocity: 0.449

Lat/Northing: 45.58026 Long/Easting: 122.75763 Total Water Depth: 41.2

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.10	7.24	9.90	16.0
Middle	20.6	1.75	7.27	9.87	16.0
Deep	38.2	1.59	7.35	9.84	16.0

Comments<sup>1</sup>: No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 CS-2 (N) S Time: 1002

Flood / Ebb Up River / Down River Avg. Velocity: 0.535

Lat/Northing: 45.58022 Long/Easting: 122.75680 Total Water Depth: 44.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.01	7.21	9.90	16.0
Middle	22.3	1.47	7.24	9.85	16.0
Deep	41.6	<u>4.35</u>	7.31	9.81	16.0

Comments<sup>1</sup>: No sheen, odor, discoloration, or suspended material observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhofer

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

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

Date: 10-11-2023      Circuit Number: 1

Station: BG EW CS-1 CS-2 N S      Time: 0832

Flood / Ebb      Up River / Down River      Avg. Velocity: 0.382

Lat/Northing: 45.57875      Long/Easting: 122.75405      Total Water Depth: 39.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	0.82	7.11	9.83	15.9
Middle	19.7	1.09	7.21	9.78	15.9
Deep	36.4	1.20	7.23	9.74	15.9

Comments<sup>1</sup>: No visible sheen observed (includes S.S., discoloration & odors)

Construction Activity: Debris removal w/ bucket

Station: BG EW N CS-1 CS-2 N S      Time: 0845

Flood / Ebb      Up River / Down River      Avg. Velocity: 0.429

Lat/Northing: 45.58035      Long/Easting: 122.75781      Total Water Depth: 43.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.03	7.20	9.81	15.9
Middle	21.8	1.15	7.24	9.77	15.9
Deep	40.6	1.41	7.26	9.73	15.9

Comments<sup>1</sup>: No visible sheen observed (includes S.S., discoloration & odors)

Construction Activity: Debris removal w/ bucket

Recorded by: D. Laffoon

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

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

Date: <u>10-11-2023</u>			Circuit Number: <u>1</u>		
Station: BG EW <u>CS-1N</u> CS-2 N S				Time: <u>0854</u>	
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: <u>0.402</u>	
Lat/Northing: <u>45.58631</u>		Long/Easting: <u>122.75770</u>		Total Water Depth: <u>42.6</u>	
	<b>Water Depth (feet)</b>	<b>Turbidity (NTU)</b>	<b>pH (-)</b>	<b>D.O. (mg/L)</b>	<b>Temp. (°C)</b>
Surface	<u>1</u>	<u>0.82</u>	<u>7.22</u>	<u>9.81</u>	<u>15.9</u>
Middle	<u>21.3</u>	<u>1.08</u>	<u>7.23</u>	<u>9.77</u>	<u>15.9</u>
Deep	<u>39.6</u>	<u>1.34</u>	<u>7.26</u>	<u>9.74</u>	<u>15.9</u>
Comments <sup>1</sup> : <u>No visible S.S., discoloration, sheen or odors observed</u>					
Construction Activity: <u>Debris removal w/ bucket</u>					
Station: BG EW CS-1 <u>CS-2N</u> N S				Time: <u>0902</u>	
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: <u>0.525</u>	
Lat/Northing: <u>45.58025</u>		Long/Easting: <u>122.75676</u>		Total Water Depth: <u>46.6</u>	
	<b>Water Depth (feet)</b>	<b>Turbidity (NTU)</b>	<b>pH (-)</b>	<b>DO (mg/L)</b>	<b>Temp. (°C)</b>
Surface	<u>1</u>	<u>1.09</u>	<u>7.21</u>	<u>9.80</u>	<u>15.9</u>
Middle	<u>23.3</u>	<u>1.14</u>	<u>7.24</u>	<u>9.76</u>	<u>15.9</u>
Deep	<u>43.6</u>	<u>1.24</u>	<u>7.2</u>	<u>9.73</u>	<u>15.9</u>
Comments <sup>1</sup> : <u>No visible S.S., sheen, discoloration or odors observed.</u>					
Construction Activity: <u>Debris removal w/ bucket</u>					
Recorded by: <u>D. Luffoon</u>					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					

Probe # 21E103678

YSI ProDSS #6970

### Water Quality Monitoring Form – Field Parameters

#### Gasco Sediments Site ISS Pilot Study

Date: 10-12-23			Circuit Number: 1		
Station: <input checked="" type="radio"/> BG EW CS-1 CS-2 N <input checked="" type="radio"/> S				Time: 1750	
Flood / <input checked="" type="radio"/> Ebb		Up River / <input checked="" type="radio"/> Down River		Avg. Velocity: 0.345	
Lat/Northing: 45.57878		Long/Easting: 122.75401		Total Water Depth: 42.8	
	<b>Water Depth</b> (feet)	<b>Turbidity</b> (NTU)	<b>pH</b> (-)	<b>D.O.</b> (mg/L)	<b>Temp.</b> (°C)
Surface	1	0.73	7.29	9.80	16.6
Middle	21.4	1.25	7.23	9.64	16.3
Deep	39.8	1.70	7.28	9.58	16.3
Comments <sup>1</sup> : • No sheen, odor, SS, or discoloration observed					
Construction Activity: ISS Drilling					
Station: BG <input checked="" type="radio"/> EW CS-1 CS-2 <input checked="" type="radio"/> N S				Time: 1800	
Flood / <input checked="" type="radio"/> Ebb		Up River / <input checked="" type="radio"/> Down River		Avg. Velocity: 0.367	
Lat/Northing: 45.58008		Long/Easting: 122.75697		Total Water Depth: 47.6	
	<b>Water Depth</b> (feet)	<b>Turbidity</b> (NTU)	<b>pH</b> (-)	<b>DO</b> (mg/L)	<b>Temp.</b> (°C)
Surface	1	0.69	7.26	9.77	16.6
Middle	23.8	1.29	7.26	9.66	16.4
Deep	44.6	1.65	7.29	9.57	16.3
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhoefer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					
* SS = suspended solids/material					

Probe #21E103678

YSI AFDSS #6970

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

Date: 10-12-2023      Circuit Number: 1

Station: BG EW CS-1 CS-2 N S      Time: 1809

Flood Ebb      Up River / Down River      Avg. Velocity: 0.366

Lat/Northing: 45.58031      Long/Easting: 122.75752      Total Water Depth: 46.8

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	0.73	7.26	9.77	16.6
Middle	23.4	1.07	7.25	9.65	16.4
Deep	43.8	1.71	7.27	9.58	16.3

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 CS-2 N S      Time: 1816

Flood Ebb      Up River / Down River      Avg. Velocity: 0.765

Lat/Northing: 45.58028      Long/Easting: 122.75672      Total Water Depth: 50.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	0.72	7.22	9.75	16.6
Middle	25.3	1.17	7.29	9.65	16.4
Deep	47.6	4.06	8.44	9.49	16.3

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed  
• Collecting Chemistry sample here @ 47.6' (highest CS NTU)

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhofer

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

\* SS = suspended solids/material

Probe # 21E103678

YSI ProDSS # 6970

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

Date: 10-13-2023			Circuit Number: 1		
Station: <u>BG</u> EW CS-1 CS-2 N <u>S</u>				Time: 0800	
Flood <u>(Ebb)</u>		Up River <u>(Down River)</u>		Avg. Velocity: 0.511	
Lat/Northing: 45.57871		Long/Easting: 122.75400		Total Water Depth: 37.6	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.83	7.15	9.51	16.4
Middle	18.8	2.55	7.14	9.47	16.5
Deep	34.6	2.46	7.20	9.45	16.8 <sup>SD</sup> 4

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

Station: BG <u>EW</u> CS-1 CS-2 <u>N</u> S			Time: 0814		
Flood <u>(Ebb)</u>		Up River <u>(Down River)</u>		Avg. Velocity: 0.108	
Lat/Northing: 45.58027		Long/Easting: 122.75710		Total Water Depth: 46	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.76	7.17	9.51	16.4
Middle	23	2.73	7.19	9.47	16.4
Deep	43	3.45	7.57	9.44	16.4

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

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

\* SS = suspended solids/material

Probe # 21E103678

 ProDSS  
 YSI #6970

### Water Quality Monitoring Form – Field Parameters

#### Gasco Sediments Site ISS Pilot Study

Date: 10-13-2023      Circuit Number: 1

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

 Flood / ~~Ebb~~      Up River / ~~Down River~~      Avg. Velocity: 0.231

Lat/Northing: 45.58031      Long/Easting: 122.75742      Total Water Depth: 43.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	2.00	7.20	9.50	16.4
Middle	21.8	3.15	7.59	9.46	16.4
Deep	40.6	3.73	7.53	9.43	16.4

 Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

 Station: BG EW CS-1 CS-2 (N) S      Time: 0838

 Flood / ~~Ebb~~      Up River / ~~Down River~~      Avg. Velocity: 0.779

Lat/Northing: 45.58027      Long/Easting: 122.75671      Total Water Depth: 46.8

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	2.38	7.19	9.50	16.5
Middle	23.4	3.03	7.20	9.46	16.4
Deep	43.8	12.36	9.25	9.41	16.4

 Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed  
 • Turbidity + pH in exceedance @ deep interval  
     ↳ recorded / observed @ 0845

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhofer

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

\* SS = suspended solids/material

Probe # 21E103678

YSI ProDSS #6970

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

Date: 10-13-2023			Circuit Number: 2		
Station: <u>BG</u> EW CS-1 CS-2 N <u>S</u>				Time: 1000	
Flood/ <u>Ebb</u>		Up River/ <u>Down River</u>		Avg. Velocity: 0.482	
Lat/Northing: 45.57878		Long/Easting: 122.75401		Total Water Depth: 40	
	<b>Water Depth (feet)</b>	<b>Turbidity (NTU)</b>	<b>pH (-)</b>	<b>D.O. (mg/L)</b>	<b>Temp. (°C)</b>
Surface	1	2.55	7.17	9.48	16.5
Middle	20	2.69	7.26	9.45	16.5
Deep	37	2.30	7.22	9.43	16.4
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Station: BG <u>EW</u> CS-1 CS-2 <u>N</u> S				Time: 1009	
Flood/ <u>Ebb</u>		Up River/ <u>Down River</u>		Avg. Velocity: 0.307	
Lat/Northing: 45.58013		Long/Easting: 122.75693		Total Water Depth: 44	
	<b>Water Depth (feet)</b>	<b>Turbidity (NTU)</b>	<b>pH (-)</b>	<b>DO (mg/L)</b>	<b>Temp. (°C)</b>
Surface	1	1.82	7.16	9.47	16.5
Middle	22	2.38	7.24	9.44	16.5
Deep	41	2.71	7.25	9.39	16.5
Comments <sup>1</sup> : • No sheen, odor, discoloration, or suspended material observed					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhofer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					
* SS = suspended solids / materials					



Probe # 21E103678 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters					
Gasco Sediments Site ISS Pilot Study					
Date: 10-13-2023			Circuit Number: 2		
Station: BG EW <u>CS-1</u> CS-2 <u>N</u> S				Time: 1016	
Flood <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.299	
Lat/Northing: 45.58032		Long/Easting: 122.75746		Total Water Depth: 43	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	2.12	7.24	9.46	16.5
Middle	21.5	2.32	7.21	9.44	16.5
Deep	40	2.53	7.26	9.39	16.5
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Station: BG EW CS-1 <u>CS-2</u> <u>N</u> S				Time: 1025	
Flood <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.757	
Lat/Northing: 45.58028		Long/Easting: 122.75677		Total Water Depth: 45.8	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.6582	7.16	9.49	16.5
Middle	22.9	2.46	7.22	9.44	16.5
Deep	42.8	2.96	7.25	9.42	16.5
Comments <sup>1</sup> : • 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.					
* SS = suspended solids/material					

Probe #21E103678 YSI Pro DSS #6970

Water Quality Monitoring Form – Field Parameters					
Gasco Sediments Site ISS Pilot Study					
Date: 10-13-2023			Circuit Number: 3		
Station: <input checked="" type="radio"/> BG EW CS-1 CS-2 N <input checked="" type="radio"/> S				Time: 1200	
Flood / <input checked="" type="radio"/> Ebb		Up River / <input checked="" type="radio"/> Down River		Avg. Velocity: 0.373	
Lat/Northing: 45.57875		Long/Easting: 122.75401		Total Water Depth: 39.8	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.83	7.30	9.59	16.5
Middle	19.9	2.37	7.22	9.51	16.5
Deep	36.8	2.56	7.27	9.48	16.5
Comments <sup>1</sup> : No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Station: BG <input checked="" type="radio"/> EW CS-1 CS-2 <input checked="" type="radio"/> N S				Time: 1250	
Flood / <input checked="" type="radio"/> Ebb		Up River / <input checked="" type="radio"/> Down River		Avg. Velocity: 0.305	
Lat/Northing: 45.58009		Long/Easting: 122.75692		Total Water Depth: 42.6	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.73	7.32	9.59	16.6
Middle	21.3	2.06	7.32	9.51	16.5
Deep	39.6	2.98	7.30	9.47	16.5
Comments <sup>1</sup> : No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhofer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					
* SS = suspended solids/material					

Probe #21E103678 YSI ProDSS #6970

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

Date: 10-13-2023			Circuit Number: 3		
Station: BG EW <del>CS-1</del> CS-2 (N) S				Time: 1300	
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.253	
Lat/Northing: 45.58029		Long/Easting: 122.75747		Total Water Depth: 41.4	
	<b>Water Depth (feet)</b>	<b>Turbidity (NTU)</b>	<b>pH (-)</b>	<b>D.O. (mg/L)</b>	<b>Temp. (°C)</b>
Surface	1	1.55	7.20	9.56	16.5
Middle	20.7	1.76	7.27	9.50	16.5
Deep	38.4	2.15	7.30	9.47	16.5
Comments <sup>1</sup> : No sheen, odor, discoloration, or suspended material observed					

Construction Activity: ISS Drilling

Station: BG EW CS-1 <u>CS-2</u> (N) S				Time: 1310	
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.377	
Lat/Northing: 45.58024		Long/Easting: 122.75676		Total Water Depth: 44.4	
	<b>Water Depth (feet)</b>	<b>Turbidity (NTU)</b>	<b>pH (-)</b>	<b>DO (mg/L)</b>	<b>Temp. (°C)</b>
Surface	1	1.39	7.19	9.56	16.6
Middle	22.2	2.62	7.28	9.50	16.5
Deep	41.4	3.87	7.27	9.44	16.5
Comments <sup>1</sup> : No sheen, odor, discoloration, or SS observed					

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhaefer

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

\* SS = suspended solids/material

Probe # 21E103678 YSI ProDSS # 6970

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

Date: 10-13-2023 Circuit Number: 4

Station: BG EW CS-1 CS-2 N S Time: 1400

Flood / Ebb Up River / Down River Avg. Velocity: 0.160

Lat/Northing: 45.58039 Long/Easting: 122.75803 Total Water Depth: 41.2

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.97	7.38	9.56	16.5
Middle	20.6	2.57	7.35	9.52	16.5
Deep	38.2	3.93	7.66	9.44	16.5

Comments<sup>1</sup>: No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 CS-2 N S Time: 1415

Flood / Ebb Up River / Down River Avg. Velocity: 0.376

Lat/Northing: 45.57918 Long/Easting: 122.75501 Total Water Depth: 39.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	2.25	7.37	9.57	16.6
Middle	19.7	3.83	7.55	9.49	16.5
Deep	36.4	4.64	8.00	9.44	16.5

Comments<sup>1</sup>: No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhofer

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

\* SS = suspended solids/material

Probe # 21E103678 YSI ProDSS #6970

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

Date: 10-13-2023 Circuit Number: 4

Station: BG EW CS-1 CS-2 N S Time: 1425

Flood / Ebb Up River / Down River Avg. Velocity: 0.409

Lat/Northing: 45.57897 Long/Easting: 122.75459 Total Water Depth: 36.4

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.87	7.28	9.55	16.5
Middle	18.2	2.81	7.42	9.49	16.5
Deep	33.4	3.59	7.68	9.46	16.5

Comments<sup>1</sup>: • No sheen, odors, discoloration, or SS observed

Construction Activity: ISS Drilling

Station: BG EW CS-1 CS-2 N S Time: 1433

Flood / Ebb Up River / Down River Avg. Velocity: 0.796

Lat/Northing: 45.57951 Long/Easting: 122.75490 Total Water Depth: 45.8

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.50	7.31	9.58	16.6
Middle	22.9	2.13	7.28	9.51	16.5
Deep	42.8	3.65	7.65	9.43	16.5

Comments<sup>1</sup>: • No sheen, odors, discoloration, or SS observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhoefer

1. Include observations of floating/suspended material, sheens, discoloration, and odors.  
\* SS = suspended solids/material

Probe # 21E103678 YSI ProDSS # 6970

Water Quality Monitoring Form – Field Parameters					
Gasco Sediments Site ISS Pilot Study					
Date: 10-13-2023			Circuit Number: 5		
Station: <u>BG</u> EW CS-1 CS-2 <u>N</u> S			Time: 1600		
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.670	
Lat/Northing: 45.58036		Long/Easting: 122.75795		Total Water Depth: 44.6	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.36	7.32	9.56	16.5
Middle	22.3	1.74	7.29	9.52	16.5
Deep	41.6	1.76	7.26	9.49	16.5
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Station: BG <u>EW</u> CS-1 CS-2 N <u>S</u>			Time: 1613		
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.273	
Lat/Northing: 45.57910		Long/Easting: 122.75475		Total Water Depth: 44.4	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.52	7.30	9.56	16.5
Middle	22.2	1.65	7.34	9.52	16.5
Deep	41.4	1.94	7.41	9.49	16.5
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Recorded by: Simon Dutenhoefel					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					
* SS = suspended solids / material					

Probe # 21E103678 YSI ProDSS #6970

### Water Quality Monitoring Form – Field Parameters

#### Gasco Sediments Site ISS Pilot Study

Date: 10-13-2023			Circuit Number: S		
Station: BG EW <u>CS-1</u> CS-2 N <u>S</u>		Time: 1622			
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.081	
Lat/Northing: 45.57889		Long/Easting: 122.75458		Total Water Depth: 35.6	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.75	7.39	9.55	16.5
Middle	17.8	1.92	7.38	9.52	16.5
Deep	32.6	1.85	7.40	9.50	16.5
Comments <sup>1</sup> : • No sheen, odor, discoloration, or suspended material observed					
Construction Activity: ISS Drilling					
Station: BG EW CS-1 <u>CS-2</u> N <u>S</u>		Time: 1631			
<u>Flood</u> / Ebb		<u>Up River</u> / Down River		Avg. Velocity: 0.341	
Lat/Northing: 45.57958		Long/Easting: 122.75493		Total Water Depth: 49.6	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.54	7.29	9.54	16.5
Middle	24.8	1.88	7.25	9.49	16.5
Deep	46.6	6.22	8.03	9.45	16.5
Comments <sup>1</sup> : • no sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Recorded by: Simon Duderhoefer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					
* SS = suspended solids / material					

Probe # 21E103678 YSI Pro DSS #6970

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

Date: 10-14-2023 Circuit Number: 1

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

Flood Ebb Up River ~~Down River~~ Avg. Velocity: 0.859

Lat/Northing: 45.57877 Long/Easting: 122.75406 Total Water Depth: 41.2

	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	2.20	7.14	9.92	16.3
Middle	20.6	2.31	7.21	9.89	16.3
Deep	38.2	2.35	7.25	9.86	16.3

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

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

Flood Ebb Up River ~~Down River~~ Avg. Velocity: 0.645

Lat/Northing: 45.38011 Long/Easting: 122.75688 Total Water Depth: 46.6

	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	2.11	7.22	9.90	16.3
Middle	23.3	1.92	7.21	9.88	16.3
Deep	43.6	2.34	7.26	9.85	16.3

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

Recorded by: Simon Dudenhofer

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

\* SS = suspended solids/material



Probe #21E103678 YSI ProDS #6970

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

Date: 10-14-2023			Circuit Number: 1		
Station: BG EW <u>CS-1</u> CS-2 <u>N</u> S			Time: 0902		
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.622	
Lat/Northing: 45.58031		Long/Easting: 122.75746		Total Water Depth: 45	
	<b>Water Depth</b> (feet)	<b>Turbidity</b> (NTU)	<b>pH</b> (-)	<b>D.O.</b> (mg/L)	<b>Temp.</b> (°C)
Surface	1	2.22	7.24	9.90	16.3
Middle	22.5	2.15	7.16	9.88	16.3
Deep	42	2.62	7.33	9.82	16.3

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed  
• Large vessel passed worksite @ 0907

Construction Activity: ISS Drilling

Station: BG EW CS-1 <u>CS-2</u> <u>N</u> S			Time: 0911		
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.624	
Lat/Northing: 45.		Long/Easting: 122.		Total Water Depth: 48.4	
	<b>Water Depth</b> (feet)	<b>Turbidity</b> (NTU)	<b>pH</b> (-)	<b>DO</b> (mg/L)	<b>Temp.</b> (°C)
Surface	1	2.07	7.28	9.91	16.3
Middle	24.2	2.79	7.21	9.92	16.3
Deep	45.4	3.76	7.29	9.92	16.2

Comments<sup>1</sup>: • No sheen, odor, discoloration, or SS observed

Construction Activity: ISS Drilling

Recorded by: Siman Dudenhofer

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

\*SS = suspended solids/material

Probe #21E103678 YSI ProDSS #6970

Water Quality Monitoring Form – Field Parameters					
Gasco Sediments Site ISS Pilot Study					
Date: 10-14-2023			Circuit Number: 2		
Station: <b>BG</b> EW CS-1 CS-2 N <b>S</b>				Time: 1030	
Flood / <del>Ebb</del>		Up River / <del>Down River</del>		Avg. Velocity: 0.339	
Lat/Northing: 45.57877		Long/Easting: 122.75401		Total Water Depth: 37.2	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	1.89	7.23	9.92	16.3
Middle	18.6	3.42	7.28	9.92	16.2
Deep	34.2	4.17	7.28	9.89	16.2
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed • Collected chemistry sample here @ each depth interval					
Construction Activity: ISS Drilling					
Station: BG <b>EW</b> CS-1 CS-2 <b>N</b> S				Time: 1037	
Flood / <del>Ebb</del>		Up River / <del>Down River</del>		Avg. Velocity: 0.373	
Lat/Northing: 45.58014		Long/Easting: 122.75687		Total Water Depth: 46.2	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	2.38	7.28	9.92	16.3
Middle	23.1	3.65	7.21	9.92	16.2
Deep	43.1	3.87	7.26	9.89	16.2
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhofer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					
*SS = suspended solids/material					

Probe # 21E103678 YSZ Process # 6970

### Water Quality Monitoring Form – Field Parameters

#### Gasco Sediments Site ISS Pilot Study

Date: 10-14-2023			Circuit Number: 2		
Station: BG EW <u>CS-1</u> CS-2 <u>N</u> S				Time: 1052	
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.066	
Lat/Northing: 45.58030		Long/Easting: 122.75746		Total Water Depth: 44.4	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	D.O. (mg/L)	Temp. (°C)
Surface	1	2.51	7.26	9.93	16.3
Middle	22.2	3.22	7.23	9.91	16.2
Deep	41.4	3.41	7.30	9.88	16.2
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
Construction Activity: ISS Drilling					
Station: BG EW CS-1 <u>CS-2</u> <u>N</u> S				Time: 1103	
Flood / <u>Ebb</u>		Up River / <u>Down River</u>		Avg. Velocity: 0.360	
Lat/Northing: 45.58024		Long/Easting: 122.75676		Total Water Depth: 47.4	
	Water Depth (feet)	Turbidity (NTU)	pH (-)	DO (mg/L)	Temp. (°C)
Surface	1	1.82	7.26	9.94	16.3
Middle	23.7	2.77	7.22	9.93	16.2
Deep	44.4	4.69	8.35	9.89	16.2
Comments <sup>1</sup> : • No sheen, odor, discoloration, or SS observed					
• Collected chemistry samples here @ each depth interval					
Construction Activity: ISS Drilling					
Recorded by: Simon Dudenhofer					
1. Include observations of floating/suspended material, sheens, discoloration, and odors.					
*SS = suspended solids/material					

Attachment 4  
Water Quality Sampling Forms –  
Chemical Parameters

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Circuit #1 - Flood Tide - ISS Drilling

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

Background Station ID: BG-1N

Lat/Northing: 45.58076

Long/Easting: 122.75848

Total Water Depth: 45.6

Sample Depth: 42.6

Sample ID: NWN-BGIN-2310091315

Date: 10-9-23

Time: 1315

Comments<sup>[1]</sup>:  
 • Collected using Van Dorn sampler  
 • Collected x2 125ml amber glass and x2 125ml amber poly containers  
 • No sheen, odor, discoloration, or suspended material observed

Compliance Station ID: CS-15

Lat/Northing: 45.57890

Long/Easting: 122.75463

Total Water Depth: ~~40.4~~ 40.4

Sample Depth: 37.4

Sample ID: NWN-CS15-2310091250

Date: 10-9-23

Time: 1250

Comments<sup>[1]</sup>:  
 • Collected using Van Dorn sampler  
 • Collected x2 125ml amber glass and x2 125ml amber poly containers  
 • No sheen, odors, 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

Circuit #2 - Flood Tide - ISS Drilling

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

Background Station ID: BG-1N

Lat/Northing: 45.58072

Long/Easting: 122.75856

Total Water Depth: 47.4

Sample Depth: 23.7

Sample ID: NWN-BG1N-2310091500

Date: 10-9-23

Time: 1500

Comments<sup>[1]</sup>:  
 • Collected using Van Dorn sampler  
 • Collected x2 125ml amber glass and x2 125ml amber poly containers  
 • No sheen, odor, discoloration, or suspended material observed

Compliance Station ID: CS-1S

Lat/Northing: 45.57894

Long/Easting: 122.75467

Total Water Depth: 36.8

Sample Depth: ~~33.8~~ 18.4

Sample ID: NWN-CS1S-2310091445

Date: 10-9-23

Time: 1445

Comments<sup>[1]</sup>:  
 • 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

Water Quality Sampling Form – Chemical Parameters			
Gasco Sediments Site ISS Pilot Study			
Background Station ID: <del>NWN-ESIN-2310110917</del> CSIN			
Lat/Northing: 45.58031	Long/Easting: 122.75755		
Total Water Depth: 43.4	Sample Depth: 40.4		
Sample ID: NWN-CSIN-2310110917	Date: 10-11-2023	Time: 0917	
Comments <sup>1</sup> : No visible SS, sheen, discoloration or odors was observed.			
Compliance Station ID: BG15			
Lat/Northing: 45.57879	Long/Easting: 122.75406		
Total Water Depth: 40.2	Sample Depth: 37.2		
Sample ID: NWN-BG15-2310110933	Date: 10-11-2023	Time: 0923	
Comments <sup>1</sup> : No visible SS, sheen, discoloration or odors was 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.			
Sampled by R. Cuffoon & C. Fuller			

Circuit #1 - Ebb Tide - ISS Drilling

**Water Quality Sampling Form – Chemical Parameters**  
**Gasco Sediments Site ISS Pilot Study**

Background Station ID: BG-1S

Lat/Northing: 45.57880

Long/Easting: 122.75407

Total Water Depth: 44.2

Sample Depth: 41.2

Sample ID: NWN-BG1S-231012183S

Date: 10-12-23

Time: 1835

Comments<sup>1</sup>:  
 • Collected using Van Dorn Sampler  
 • Collected x2 125ml amber glass and x1 125ml amber poly containers  
 • No sheen, odor, discoloration, or suspended material observed

Compliance Station ID: CS-2N

Lat/Northing: 45.58027

Long/Easting: 122.75673

Total Water Depth: 50.6

Sample Depth: 47.6

Sample ID: NWN-CS2N-231012182S

Date: 10-12-23

Time: 1825

Comments<sup>1</sup>:  
 • Collected using Van Dorn sampler  
 • Collected x2 125ml amber glass and x1 amber poly containers  
 • Sample cloudy, ~~PAHs~~  
 • 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.

• Collected and recorded by Simon Dudenhofer



Circuit #2 - Ebb Tide - ISS Drilling

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

Background Station ID: BG-15

Lat/Northing: 45.57870

Long/Easting: 122.75405

Total Water Depth: 39

Sample Depth: 1

Sample ID: NWN-BG15-2310141205

Date: 10-14-23

Time: 1205

Comments:  
 • Collected using Van Dorn sampler  
 • Collected x2 125ml amber glass + x1 125ml amber poly containers  
 • No sheen, odor, discoloration, or SS observed

Compliance Station ID: CS-2N

Lat/Northing: 45.58024

Long/Easting: 122.75668

Total Water Depth: 47

Sample Depth: 1

Sample ID: NWN-CS2N-2310141145

Date: 10-14-23

Time: 1145

Comments:  
 • Collected using Van Dorn sampler  
 • Collected x2 125ml amber glass and x1 <sup>125ml</sup> amber poly containers  
 • No sheen, odor, discoloration, or SS observed

**Analytical Suite**

Analyte	Bottle	Method	Preservative
Free Cyanide	125-mL Amber Poly 125-mL Amber Poly	ASTM D4282	NaOH 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.

\* SS = suspended solids/material

\* recorded + collected by Simon Dudenhoefer

Circuit #2 - Ebb Tide - ISS Drilling

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

Background Station ID: BG-15

Lat/Northing: 45.57870

Long/Easting: 122.75405

Total Water Depth: 39

Sample Depth: 19.5

Sample ID: NWN-BG15-2310141210

Date: 10-14-23

Time: 1210

Comments: • Collected using Van Dorn sampler  
• Collected x2 125 ml amber glass and x1 125ml amber poly containers  
• No sheen, odor, discoloration, or SS observed

Compliance Station ID: CS-2N

Lat/Northing: 45.58024

Long/Easting: 122.75668

Total Water Depth: 47

Sample Depth: 23.5

Sample ID: NWN-CS2N-2310141150

Date: 10-14-23

Time: 1150

Comments: • Collected using Van Dorn sampler  
• Collected x2 125ml amber glass and x1 125ml amber poly containers  
• No sheen, odor, discoloration, or SS observed

**Analytical Suite**

Analyte	Bottle	Method	Preservative
Free Cyanide	125-mL Amber Poly <del>125-mL Amber Poly</del>	ASTM D4282	NaOH <del>None</del>
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.

\* SS = suspended solids/material

\* recorded + collected by Simon Dudenhofer

Circuit #2 - Ebb Tide - ISS Drilling

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

Background Station ID: BG-15

Lat/Northing: 4S, 57870

Long/Easting: 122.75405

Total Water Depth: 39

Sample Depth: 36

Sample ID: NWN-BG15-2310141215

Date: 10-14-23

Time: 1215

Comments:  
 • Collected QC Field Dup. Sample here: NWN-BG1015-2310141215  
 • Collected using Van Dorn sampler  
 • Collected x2 125 ml amber glass + x1 125ml amber poly containers for each sample  
 • No sheen, odor, discoloration, or SS observed

Compliance Station ID: CS-2N

Lat/Northing: 4S, 58024

Long/Easting: 122.75668

Total Water Depth: 47

Sample Depth: 44

Sample ID: NWN-CS2N-2310141155

Date: 10-14-23

Time: 1155

Comments:  
 • Collected using Van Dorn sampler  
 • Collected x2 125ml/amber glass + x1 125ml amber poly containers  
 • No sheen, odor, discoloration, or SS observed

**Analytical Suite**

Analyte	Bottle	Method	Preservative
Free Cyanide	125-mL Amber Poly 125-mL Amber Poly	ASTM D4282	NaOH <del>None</del>
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.

\* SS = suspended solids/materials

\* recorded + collected by Simon Dudenhofer

# Attachment 5

## Water Quality Field Parameter Measurements

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**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) <sup>1</sup>	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample	
1	10/9/2023	12:57	Upriver	BG-1N	North	45.6	1	Surface	1.16	--	7.03	9.88	16.2		
							22.8	Middle	1.21	--	7.10	9.87	16.1		
							42.6	Deep	1.64	--	7.11	9.79	16.1	X	
		12:03		EW-1S	South	43	1	Surface	1.43	0.27	7.21	9.94	16.1		
							21.5	Middle	1.37	0.16	7.15	9.82	16.1		
							40	Deep	3.75	2.11	7.98	9.75	16.1		
		12:21		CS-1S	South	40.6	1	Surface	1.23	0.07	7.11	9.86	16.2		
							20.3	Middle	1.49	0.28	7.18	9.84	16.1		
							37.6	Deep	3.65	2.01	7.78	9.77	16.1	X	
		12:32		CS-2S	South	46.4	1	Surface	1.26	0.1	7.14	9.88	16.1		
							23.2	Middle	1.33	0.12	7.08	9.83	16.1		
							43.4	Deep	2.17	0.53	7.14	9.80	16.1		
2	10/9/2023	14:03	Upriver	BG-1N	North	47.2	1	Surface	0.87	--	7.17	9.94	16.2		
							23.6	Middle	1.42	--	7.15	9.88	16.2	X	
							44.2	Deep	1.49	--	7.16	9.84	16.2		
		14:14		EW-1S	South	42.4	1	Surface	2.16	1.29	7.32	9.90	16.2		
							21.2	Middle	2.35	0.93	7.38	9.86	16.2		
							39.4	Deep	2.49	1	7.52	9.83	16.2		
		14:25		CS-1S	South	32.0	1	Surface	1.56	0.69	7.30	9.91	16.2		
							16	Middle	1.94	-0.41	7.28	9.88	16.2	X	
							29	Deep	1.75	0.26	7.30	9.86	16.2		
		14:32		CS-2S	South	47.0	1	Surface	0.94	0.07	7.19	9.96	16.2		
							23.5	Middle	1.18	-0.24	7.15	9.89	16.2		
							44.0	Deep	1.17	-0.32	7.17	9.84	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) <sup>1</sup>	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
1	10/10/2023	9:30	Downriver	BG-1S	South	39.4	1	Surface	1.25	--	7.17	9.89	16.0	
							19.7	Middle	1.43	--	7.21	9.86	16.0	
							36.4	Deep	1.32	--	7.22	9.83	16.0	
		9:40		EW-1N	North	42.8	1	Surface	1.05	-0.2	7.23	9.91	16.0	
							21.4	Middle	1.22	-0.21	7.25	9.87	16.0	
							39.8	Deep	5.93	4.61	7.62	9.82	16.0	
		9:50		CS-1N	North	41.2	1	Surface	1.10	-0.15	7.24	9.90	16.0	
							20.6	Middle	1.75	0.32	7.27	9.87	16.0	
							38.2	Deep	1.59	0.27	7.35	9.84	16.0	
		10:02		CS-2N	North	44.6	1	Surface	1.01	-0.24	7.21	9.90	16.0	
							22.30	Middle	1.47	0.04	7.24	9.85	16.0	
							41.6	Deep	1.35	0.03	7.31	9.81	16.0	
1	10/11/2023	8:32	Downriver	BG-1S	South	39.4	1	Surface	0.82	--	7.11	9.83	15.9	
							19.7	Middle	1.09	--	7.21	9.78	15.9	
							36.4	Deep	1.20	--	7.23	9.74	15.9	X
		8:45		EW-1N	North	43.6	1	Surface	1.03	0.21	7.20	9.81	15.9	
							21.8	Middle	1.15	0.06	7.24	9.77	15.9	
							40.6	Deep	1.41	0.21	7.26	9.73	15.9	
		8:54		CS-1N	North	42.6	1	Surface	0.82	0	7.22	9.81	15.9	
							21.3	Middle	1.08	-0.01	7.23	9.77	15.9	
							39.6	Deep	1.34	0.14	7.26	9.74	15.9	X
		9:02		CS-2N	North	46.6	1	Surface	1.09	0.27	7.21	9.80	15.9	
							23.30	Middle	1.14	0.05	7.24	9.76	15.9	
							43.6	Deep	1.24	0.04	7.20	9.73	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) <sup>1</sup>	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
1	10/12/2023	17:50	Downriver	BG-1S	South	42.8	1	Surface	0.73	--	7.29	9.80	16.6	
							21.4	Middle	1.25	--	7.23	9.64	16.3	
							39.8	Deep	1.70	--	7.28	9.58	16.3	X
		18:00		EW-1N	North	47.6	1	Surface	0.69	-0.04	7.26	9.77	16.6	
							23.8	Middle	1.29	0.04	7.26	9.66	16.4	
							44.6	Deep	1.65	-0.05	7.29	9.57	16.3	
		18:09		CS-1N	North	46.8	1	Surface	0.73	0	7.26	9.77	16.6	
							23.4	Middle	1.07	-0.18	7.25	9.65	16.4	
							43.8	Deep	1.71	0.01	7.27	9.58	16.3	
		18:16		CS-2N	North	50.6	1	Surface	0.72	-0.01	7.22	9.75	16.6	
							25.3	Middle	1.17	-0.08	7.29	9.65	16.4	
							47.6	Deep	4.06	2.36	8.44	9.49	16.3	X
1	10/13/2023	8:00	Downriver	BG-1S	South	37.6	1	Surface	1.83	--	7.15	9.51	16.4	
							18.8	Middle	2.55	--	7.14	9.47	16.5	
							34.6	Deep	2.46	--	7.20	9.45	16.4	
		8:14		EW-1N	North	46.0	1	Surface	1.76	-0.07	7.17	9.51	16.4	
							23	Middle	2.73	0.18	7.19	9.47	16.4	
							43	Deep	3.45	0.99	7.57	9.44	16.4	
		8:30		CS-1N	North	43.6	1	Surface	2.00	0.17	7.20	9.50	16.4	
							21.8	Middle	3.15	0.6	7.59	9.46	16.4	
							40.6	Deep	3.73	1.27	7.53	9.43	16.4	
		8:38		CS-2N	North	46.8	1	Surface	2.38	0.55	7.19	9.50	16.5	
							23.4	Middle	3.03	0.48	7.20	9.46	16.4	
							43.8	Deep	12.36	9.9	9.25	9.41	16.4	

**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) <sup>1</sup>	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
2	10/13/2023	10:00	Downriver	BG-1S	South	40.0	1	Surface	2.55	--	7.17	9.48	16.5	
							20	Middle	2.69	--	7.26	9.45	16.5	
							37.0	Deep	2.30	--	7.22	9.43	16.4	
		10:09		EW-1N	North	44.0	1	Surface	1.82	-0.73	7.16	9.47	16.5	
							22	Middle	2.38	-0.31	7.24	9.44	16.5	
							41	Deep	2.71	0.41	7.25	9.39	16.5	
		10:16		CS-1N	North	43.0	1	Surface	2.12	-0.43	7.24	9.46	16.5	
							21.5	Middle	2.32	-0.37	7.21	9.44	16.5	
							40	Deep	2.53	0.23	7.26	9.39	16.5	
		10:25		CS-2N	North	45.8	1	Surface	1.82	-0.73	7.16	9.49	16.5	
							22.90	Middle	2.46	-0.23	7.22	9.44	16.5	
							42.8	Deep	2.96	0.66	7.25	9.42	16.5	
3	10/13/2023	12:00	Downriver	BG-1S	South	39.8	1	Surface	1.83	--	7.30	9.59	16.5	
							19.9	Middle	2.37	--	7.22	9.51	16.5	
							36.8	Deep	2.56	--	7.27	9.48	16.5	
		12:50		EW-1N	North	42.6	1	Surface	1.73	-0.1	7.32	9.59	16.6	
							21.3	Middle	2.06	-0.31	7.32	9.51	16.5	
							39.6	Deep	2.98	0.42	7.30	9.47	16.5	
		13:00		CS-1N	North	41.4	1	Surface	1.55	-0.28	7.20	9.56	16.5	
							20.7	Middle	1.76	-0.61	7.27	9.50	16.5	
							38.4	Deep	2.15	-0.41	7.30	9.47	16.5	
		13:10		CS-2N	North	44.4	1	Surface	1.39	-0.44	7.19	9.56	16.6	
							22.2	Middle	2.62	0.25	7.28	9.50	16.5	
							41.4	Deep	3.87	1.31	7.27	9.44	16.5	



**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) <sup>1</sup>	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
4	10/13/2023	14:00	Upriver	BG-1N	North	41.2	1	Surface	1.97	--	7.38	9.56	16.5	
							20.6	Middle	2.57	--	7.35	9.52	16.5	
							38.2	Deep	3.93	--	7.66	9.44	16.5	
		14:15		EW-1S	South	39.4	1	Surface	2.25	0.28	7.37	9.57	16.6	
							19.7	Middle	3.83	1.26	7.55	9.49	16.5	
							36.4	Deep	4.64	0.71	8.00	9.44	16.5	
		14:25		CS-1S	South	36.4	1	Surface	1.87	-0.1	7.28	9.55	16.5	
							18.2	Middle	2.81	0.24	7.42	9.49	16.5	
							33.4	Deep	3.59	-0.34	7.68	9.46	16.5	
		14:33		CS-2S	South	45.8	1	Surface	1.50	-0.47	7.31	9.58	16.6	
							22.9	Middle	2.13	-0.44	7.28	9.51	16.5	
							42.8	Deep	3.65	-0.28	7.65	9.43	16.5	
5	10/13/2023	16:00	Upriver	BG-1N	North	44.6	1	Surface	1.36	--	7.32	9.56	16.5	
							22.3	Middle	1.74	--	7.29	9.52	16.5	
							41.6	Deep	1.76	--	7.26	9.49	16.5	
		16:13		EW-1S	South	44.4	1	Surface	1.52	0.16	7.30	9.56	16.5	
							22.2	Middle	1.65	-0.09	7.34	9.52	16.5	
							41.4	Deep	1.94	0.18	7.41	9.49	16.5	
		16:22		CS-1S	South	35.6	1	Surface	1.75	0.39	7.39	9.55	16.5	
							17.8	Middle	1.92	0.18	7.38	9.52	16.5	
							32.6	Deep	1.85	0.09	7.40	9.50	16.5	
		16:31		CS-2S	South	49.6	1	Surface	1.54	0.18	7.29	9.54	16.5	
							24.8	Middle	1.88	0.14	7.26	9.49	16.5	
							46.6	Deep	6.22	4.46	8.03	9.45	16.5	

**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) <sup>1</sup>	pH	DO (mg/L)	Temperature (C°)	Chemistry Sample
1	10/14/2023	8:30	Downriver	BG-1S	South	41.2	1	Surface	2.20	--	7.14	9.92	16.3	
							20.6	Middle	2.31	--	7.21	9.89	16.3	
							38.2	Deep	2.35	--	7.26	9.86	16.3	
		8:50		EW-1N	North	46.6	1	Surface	2.11	-0.09	7.22	9.90	16.3	
							23.3	Middle	1.92	-0.39	7.21	9.88	16.3	
							43.6	Deep	2.34	-0.01	7.26	9.85	16.3	
		9:02		CS-1N	North	45.0	1	Surface	2.22	0.02	7.24	9.90	16.3	
							22.5	Middle	2.15	-0.16	7.16	9.88	16.3	
							42	Deep	2.62	0.27	7.33	9.82	16.3	
		9:11		CS-2N	North	48.4	1	Surface	2.07	-0.13	7.28	9.91	16.3	
							24.2	Middle	2.79	0.48	7.21	9.92	16.3	
							45.4	Deep	5.76	3.41	7.29	9.92	16.2	
2	10/14/2023	10:30	Downriver	BG-1S	South	37.2	1	Surface	1.89	--	7.23	9.92	16.3	X
							18.6	Middle	3.42	--	7.28	9.92	16.2	X
							34.2	Deep	4.17	--	7.28	9.89	16.2	X
		10:37		EW-1N	North	46.2	1	Surface	2.38	0.49	7.28	9.92	16.3	
							23.1	Middle	3.65	0.23	7.21	9.92	16.2	
							43.2	Deep	3.87	-0.3	7.26	9.89	16.2	
		10:52		CS-1N	North	44.4	1	Surface	2.51	0.62	7.26	9.93	16.3	
							22.2	Middle	3.22	-0.2	7.23	9.91	16.2	
							41.4	Deep	3.41	-0.76	7.30	9.88	16.2	
		11:03		CS-2N	North	47.4	1	Surface	1.82	-0.07	7.26	9.94	16.3	X
							23.7	Middle	2.77	-0.65	7.22	9.93	16.2	X
							44.4	Deep	4.69	0.52	8.35	9.89	16.2	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

CS: compliance station

DO: dissolved oxygen

EW: early warning

mg/L: milligram per liter

NTU: nephelometric turbidity unit

# Attachment 6

## Water Quality Chemical Parameter Measurements



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**Water Quality Monitoring Chemical Results**  
**Gasco Sediments Site ISS Field Pilot Study**

	Sample Date	ISS Mixing		Swell Removal		ISS Mixing				Debris Removal		ISS Mixing		
		10/3/2023	10/3/2023	10/4/2023	10/4/2023	10/9/2023	10/9/2023	10/9/2023	10/9/2023	10/11/2023	10/11/2023	10/12/2023	10/12/2023	
	Time	9:45	9:25	14:30	14:15	13:15	12:50	15:00	14:45	9:33	9:17	18:35	18:25	
	Location ID	BG-1N	CS-2S	BG-1S	CS-2N	BG-1N	CS-1S	BG-1N	CS-1S	BG-1S	CS-1N	BG-1S	CS-2N	
	Depth (feet)	43	47	38.4	43.6	42.6	37.4	23.7	18.4	37.2	40.4	41.2	47.6	
Analyte	Chronic WQC <sup>1,2</sup>	Acute WQC <sup>1,2</sup>												
<b>Polycyclic Aromatic Hydrocarbons (µg/L)</b>														
Benzo(a)anthracene	2.2	9.2	<b>0.804</b>	<b>1.04</b>	<b>0.024 J</b>	<b>0.350</b>	<b>0.0194 J</b>	<b>1.24</b>	0.016 U	<b>0.253</b>	0.0167	<b>0.0187 J</b>	<b>0.0168 J</b>	<b>0.657</b>
Benzo(a)pyrene	0.96	4	<b>1.09<sup>3</sup></b>	<b>1.35<sup>3</sup></b>	<b>0.0282 J</b>	<b>0.296</b>	<b>0.0259 J</b>	<b>1.54<sup>4</sup></b>	0.016 U	<b>0.328</b>	0.0167	<b>0.0240 J</b>	<b>0.0232 J</b>	<b>0.865</b>

Notes:

- Acute criteria will be the compliance criteria for water quality monitoring during all Pilot Study activities because such activities are intermittent and ephemeral in nature. Chronic criteria will be used to evaluate the effectiveness of construction BMPs and the potential need for additional or enhanced BMPs but will not be used for compliance purposes.
- Acute and chronic PAH criteria are from *Procedures for Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures* (EPA 2003).
- The result for Benzo(a)pyrene was higher than the chronic water quality criterion at both the background and compliance stations on 10/3. The chronic criterion is based on a 4-day average concentration. The 2-day average (10/3 and 10/4) concentrations for both the background and compliance stations are below the chronic criterion.
- The result for Benzo(a)pyrene was higher than the chronic water quality criterion at the compliance station during circuit 1 on 10/9. The chronic criterion is based on a 4-day average concentration. The 1-day average (on 10/9) concentration for the compliance station was below the chronic criterion.

 Detected concentration is greater than the acute water quality criteria  
 Detected concentration is greater than the chronic water quality criteria

**Bold:** Detected result

J: Estimated value

U: Compound analyzed but not detected above detection limit

µg/L: micrograms per liter

BMP: best management practice

ISS: in situ stabilization and solidification

WQC: water quality criteria

Reference:

EPA (U.S. Environmental Protection Agency), 2003. *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures*. Office of Research and Development. EPA 600-R-02-013. November 2003. Available at: <https://clu-in.org/conf/tio/porewater1/resources/EPA-ESB-Procedures-PAH-mixtures.pdf>.

## Attachment 7

# Moonpool Informational Measurements



**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	Ⓢ 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.

### Moonpool Informational Measurements Gasco Sediments Site ISS Field Pilot Study

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	06:57:11	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 <sup>1</sup>	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.

**Moonpool Informational Measurements  
Gasco Sediments Site ISS Field Pilot Study**

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

Notes:

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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)
7-9	10-4-2023	06:38	PRE	14	1	6.95	*59 15.4
7-9	↓	06:42	↓	↓	7	7.28	15.4
7-9	↓	06:45	↓	↓	11	7.46	15.5
7-9	10-4-2023	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:

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### Moonpool Informational Measurements Gasco Sediments Site ISS Field Pilot Study

ISS Column Location	Date	Time	Pre-/Post-Measurement	Water Column Thickness (feet)	Measurement Depth (feet below surface)	pH	Temperature (°C)
<del>Column 8-1</del> Column 8-1	10/9/23	07:35	Pre	14.5	1	7.09	16.3
↓	↓	07:38	Pre	14.5	7.25	7.33	16.2
↓	↓	07:41	Pre	14.5	11.5	7.40	16.2
Column 8-1	10/9/23	10:34	Pre	16.6	1	7.19	16.8
↓	↓	10:38	Pre	16.6	5.3	7.39	16.5
↓	↓	10:42	Pre	16.6	13.6	7.42	16.5
↓	10/9/23	12:23	Post	16.1	1'	7.10	16.9
↓	↓	12:25	Post	16.1	8.05'	7.45	16.7
↓	↓	12:27	Post	16.1	13.1'	7.42	<del>16.6</del> 16.6
Column 8-2	10/10/2023	06:52	Pre	19.9	1'	7.05	15.3
↓	↓	06:58	Pre	19.9	10'	7.44	15.6
↓	↓	07:06	Pre	19.9	17'	7.49	15.6
Column 8-2	10/10/2023	10:21	Post	15.3	1'	7.05	15.4
↓	↓	10:25	Post	15.3	7.6'	7.66	15.6
↓	↓	10:29	Post	15.3	12.3'	7.73	15.8
Column 8-10	10/12/2023	1:15:58	Pre	19.5	1'	7.04	<del>16</del> 17.7
↓	↓	1:16:01	Pre	19.5	9.75'	7.41	17.2
↓	↓	1:16:05	Pre	19.5	16.5'	7.43	17.0
Column 8-10	10/12/2023	18:22	Post	20.1	1'	7.52	16.9
↓	↓	18:25	Post	20.1	10.0'	8.02	16.9
↓	↓	18:29	Post	20.1	17.1'	8.27	16.9

Notes:

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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)
Column 8-9	10-13-2023	0630	Pre	20.2	1'	7.16	15.1
↓	↓	0634	Pre	↓	10.1'	7.39	15.6
↓	↓	0640	Pre	↓	17.2'	7.35	15.3
Column 8-9	10-13-2023	0743	Post	19.0	1'	7.93	15.9
↓	↓	0747	Post	↓	9.5'	9.10	16.0
↓	↓	0752	Post	↓	16.0'	9.30	16.2
Column 6-11	10-14-2023	0711	Pre	18.2	1'	6.91	15.8
↓	↓	0715	Pre	↓	9.1'	7.34	16.0
↓	↓	0719	Pre	↓	15.2'	7.45	16.2
Column 6-11	10-14-2023	0831	Post	22.0'	1'	7.57	15.2
↓	↓	0834	Post	↓	11'	8.77	16.0
↓	↓	0838	Post	↓	19'	8.84	16.0

Notes:  
 Recheck calibration after post readings on 10-19-2023 → OK.