

DAILY SCIENCE LOG BOOK

MISSION
NUMBER

2021-001

DATE:

From: Jan 30, 2021

To: Feb 18, 2021

VESSEL:

Tully CCGS J.P. Tully

PROJECT(S):

Line P line P

Water Properties Group
Fisheries and Oceans Canada
Institute of Ocean Sciences
Ocean Sciences Division
North Saanich, BC, Canada

WaterProperties.ca

Captain:	<u>KENT REID</u>	First Officer:	<u>SIMON CLAPPE</u>
Second Officer:	<u>ALISTAIR BUTT</u>	Third Officer:	<u>STEPHEN LOWDON</u>
Fishing Master:	<u></u>	Chief Engineer:	<u>STUART BULSAW</u>

Mission Participants / Agencies:

05D

**** Chief Scientist to tape Scientific Personnel section of their cruise plan here ****

This is accessed from your WaterProperties.ca Dashboard or from here:

<https://www.waterproperties.ca/requests/cruiseplanview.php?cruiseid=YYY-NNN>

SCIENTIFIC PERSONNEL

NAME	WATCH	CABIN
MARK BELTON	12-24 / 06-18	B
MICHAEL ARYCHUK	12-24	C
GLENN COOPER	12-24 / 06-18	D
ROWAN FOX	18-06 / 12-24	E
MOIRA GALBRAITH	00-12	F
KYLE SIMPSON	00-12	G
CINDY WRIGHT	00-12	H
MARIE ROBERT	06-18	A

**** The following 3 pages are VERY IMPORTANT as they document equipment and settings used on board ****

These pages are to be completed by the CTD Technician setting up the equipment, the Watch Leader on board, and the Chief Scientist MUST verify that all relevant sections are completed prior to leaving the vessel. Any mid-cruise changes to be noted by watch leader in the notes.

Data logging computer: WP #102

Data acquisition program: SeaSave

CTD deck unit make: SBE model: 11 serial number: 0425

Primary CTD

Make: SBE model: 9 serial number: 550

Primary temperature serial number: 2106

Primary conductivity serial number: 2280

Secondary temperature serial number: 2663

Secondary conductivity serial number: 2754

Transmissometer: Wetlabs Model: GStar serial: 1185DR

Transmissometer: " Model: " serial: 1883DG

Fluorometer: Model Seydian Cable gain: 10X serial: 3949 P, S or NO pump?

Fluorometer: Model SBE Cable gain: serial: P, S or NO pump?

Oxygen sensor: SBE Model: 43 serial: 997 P, S or NO pump?

PAR sensor: Biospherical Model: serial: 70614 Surface PAR? Y/N

Other sensors: Valport Altimeter serial: 75321 P, S or NO pump?

Other sensors: Pump Primary serial: 4547 P, S or NO pump?

Other sensors: Pump Secondary serial: 3353 P, S or NO pump?

Other sensors: serial: P, S or NO pump?

Secondary CTD

Make: serial number: 443

Primary temperature serial number:

Primary conductivity serial number:

Secondary temperature serial number:

Secondary conductivity serial number:

Transmissometer: Model: serial:

Transmissometer: Model: serial:

Fluorometer: Model Cable gain: serial: P, S or NO pump?

Fluorometer: Model Cable gain: serial: P, S or NO pump?

Oxygen sensor: Model: serial: P, S or NO pump?

PAR sensor: Model: serial: Surface PAR? Y/N

Other sensors: serial: P, S or NO pump?

Other sensors: serial: P, S or NO pump?

Other sensors: serial: P, S or NO pump?

Other sensors: serial: P, S or NO pump?

CTD calibration bottle location (height above CTD in metres):

This also includes the bottle location above the CTD on non-rosette casts (typical on small launches).

Rosette Setup:

Number of bottles: 24
Manufacturer: General Oceanics / Florida test equipment
Volume of bottles (litres): 10

Rosette/Niskin Bottle Serial Numbers:

1: <u>2016-10-04</u>	2: <u>2016-10-05</u>	3: <u>2016-10-06</u>	4: <u>2016-10-07</u>	5: <u>2016-10-08</u>
6: <u>2018-10-02</u>	7: <u>2000-10-29</u>	8: <u>2016-10-07</u>	9: <u>2018-10-01</u>	10: <u>2000-10-30</u>
11: <u>2018-10-04</u>	12: <u>2016-10-10</u>	13: <u>2016-10-11</u>	14: <u>2016-10-01</u>	15: <u>2000-10-24</u>
16: <u>2016-10-12</u>	17: <u>2000-10-23</u>	18: <u>2016-10-13</u>	19: <u>2016-10-14</u>	20: <u>2016-10-15</u>
21: <u>2016-10-03</u>	22: <u>2016-10-10</u>	23: <u>2016-10-17</u>	24: <u>2016-10-18</u>	

Make sure to note any bottle changes or repairs during your cruise in this log book.

Winches:

1. Make: HAWBOLDT Model: _____ Serial #: 17026 Used for: CTD-ROSETTE
2. Make: HAWBOLDT Model: _____ Serial #: 1076-01 Used for: TRACE METAL GOPOS
3. Make: SWANN Model: _____ Serial #: 329 Used for: BONGOS

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

4 HAWBOLDT 17027 SPARE

Salinometer:

Make: _____ Model: _____ Serial Number: _____
Comments on performance during cruise (comments should also be reflected in the post-cruise report):

Label Printers:

Primary Printer Kit #: _____
Secondary Printer Kit #: _____
Software Version: _____

Thermosalinograph System (SBE21/45):

Program: _____ Version: _____
Sampling interval (seconds): _____
TSG serial number: 0620
Fluorometer sensor serial number: 4538

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

ADCP Setup:

Computer time zone: _____ User Exits: Name: _____ Exit points: _____
Sampling interval (sec): _____ Name: _____ Exit points: _____
Bin Length: (2^x): _____ Name: _____ Exit points: _____
Pulse Length: _____ Work File: _____
Buffer (bytes): _____
Gyro Offset: _____

Comments on performance during cruise (comments should also be reflected in the post-cruise report):

CTD Test Cast Information

Test Cast along side? Yes No

Comments

Test Cast in Saanich Inlet or other location? ☒ Yes ☐ No

Comments

CTD pressure reading on deck (db), before cast: _____ after cast: _____

Pumps working? ☒ Yes (0011) ☐ No (0010)

Secondary Temp – Primary Temp:
(Average from the mixed region) _____

Secondary Salinity – Primary Salinity: _____
(Average from the mixed region)

Additional Comments:

Scientific Equipment Used During Cruise

This sheet allows you to enter all of the equipment used while on board. Please use the separate CTD sheet for entry for SBE 9/16/19/25.

Other CTD units:

RBR Serial Number: _____ Sensors: _____

Others: _____

Plankton Nets:

Bongo/SCOR #1 ✓	Frame Size: 50 cm	Mesh: 236 µm	Flowmeter: 7132
Bongo/SCOR #2 ✓	Frame Size: 50 cm	Mesh: 236 µm	Flowmeter: _____
_____	Frame Size: _____ cm	Mesh: _____ µm	Flowmeter: _____
_____	Frame Size: _____ cm	Mesh: _____ µm	Flowmeter: _____

Multinet ☐ BIONESS ☐ Neuston ☐ Others: _____

RBR

Trawl Gear:

Midwater Trawls: SOG ☐ Highseas ☐ Pelagic ☐ Other: _____

Bottom Trawls: Atlantic Western IIA ☐ Yankee 36 Hard & Soft Bottom ☐ Other: _____

American Shrimp Trawl ☐

Notes: _____

Trawl Doors: USA Jet ☐ Tyburon ☐ _____

Sounders : Wesmar 380 ☐ Others: _____

Acoustics:

Echosounder #1 _____ Frequencies (KHz): 12 ☐ 18 ☐ 38 ☐ 70 ☐ 120 ☐ 200 ☐

Others: _____

Echosounder #2 _____ Frequencies (KHz): 12 ☐ 18 ☐ 38 ☐ 70 ☐ 120 ☐ 200 ☐

Others: _____

Software & Notes: _____

Other Gear in Operation:

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 1 of 25

Month JANUARY				Year 2021			Vessel JP TULLY			Cruise ID 2021-001					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
1	SI	31	02:49	BE	ROS	US	48° 39.570	123° 29.920	170		-	-	MB	☒	TEST CAST TO 100M
			07:51	BO			48° 39.570	123° 29.920		100	-			☐	CLOSE BOTTLES @ SURF
			0:	EN			48°	123°			-			☐	DIDN'T ARCHIVE
2	SI	31	02:56	BE	ROS	US	48° 39.585	123° 29.905	170		-	-	MB	☐	ROBO
			07:58	BO			48° 39.590	123° 29.900		160	-			☐	STARTED COMING
			03:01	EN			48° 39.590	123° 29.880			-			☐	UP & THEN BACK TO 10 OFF BOTTOM
3	HAROSS	31	05:48	BE	ROS	US	48° 36.960	123° 14.641	226		1-13	13	MB	☒	
			05:58	BO			48° 36.750	123° 14.605		218	-			☐	
			06:13	EN			48° 36.202	123° 14.422			-			☐	
4	HAROSS	31	06:37	BE	NET	-	48° 35.897	123° 14.688	218		-	-	MA	☐	
			06:41	BO			48° 35.745	123° 14.559		210	-			☐	
			06:44	EN			48° 35.662	123° 14.499			-			☐	
5	JF1	31	09:34	BE	LOOP	✓	48° 16.143	123° 30.012	146	4.5	5005	✓	MG	☐	1 NOT 1 SAL 2 CHL
6	JF2	31	11:58	BE	ROS		48° 17.96	123° 59.90	189		14-24	11	MG	☒	
			12:05	BO			° 17.94	° 58.85			-			☐	
			12:20	EN			° 17.77	° 59.42			-			☐	
7	JF2	31	12:43	BE	NET		48° 17.91	123° 59.88	189		✓	✓	MG	☐	Box 10
			12:47	BO			° 17.89	° 59.80		190	-			☐	
			13:00	EN			° 17.88	° 59.84			-			☐	

Event Type:

BOT = Bottle cast (no CTD)
CTD = Standalone CTD
ROS = CTD in Rosette
SET = Fish Set

LOOP = Sea Water Loop
MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter

Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
DN = Down / No stop

Time Code:

BE = Beginning Time of Cast
BO = Bottom Time of Cast
EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
MR = Messenger Release Time
RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
Version: 17 Feb 2020

Notes:

EVENT 1

DID NOT ARCHIVE, REDO

P1.5/25

EVENT 2

CLOSED BOTTLES @ SURFACE FOR INTEGRITY TEST.

TSG STARTED ~ 1930 LOCAL 30 JANUARY 2021 = 0330 UTC

ASST. MGR. TOM

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month			Year			Vessel			Cruise ID						
JANUARY/FEB			2021			SP TULLY			2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
8	JF3	31	15:28	RE	LOOP	/	48° 27.08	124° 30.01	222	4.5	5008	-	MG	☐ ☐	1 NOT 1 SAL 2 CHL
9	JF4	31	17:35	BE	LOOP	/	° 30.94	° 00.05	74	4.5	5009	-	MG	☐ ☐	1 NOT 1 SAL 2 CHL
10	P1	31	19:48	BE	ROS	US	48° 34.500	125° 30.130	130		25 - 27	3	MB	☒ ☐	
			19:50	BO			48° 34.490	125° 30.140		126	-			☐ ☐	
			19:55	EN			48° 34.470	125° 30.140			-			☐ ☐	
11	P2	31	22:13	BE	ROS	US	48° 36.070	125° 59.950	116		28 - 38	11	MB	☒ ☐	DRS CAST
			22:15	BO			48° 36.070	125° 59.970		111	-			☐ ☐	
			22:29	EN			48° 36.067	126° 0.038			-			☐ ☐	
12	P2	31	22:37	BE	NET		48° 36.01	126° 00.01	115		-	-	MB	☐ ☐	Blank
			22:41	BO			48° 36.00	125° 59.95		105	-			☐ ☐	POSITION TIME FROM SUPPLY
			22:43	EN			48° 36.02	125° 59.99			-			☐ ☐	
13	P2	31	23:07	BE	ROS	US	48° 36.004	125° 59.951	120		39 - 46	8	MB	☒ ☐	DEEP CAST
			23:09	BO			48° 36.008	125° 59.971		106	-			☐ ☐	
			23:17	EN			48° 36.016	126° 0.014			-			☐ ☐	
14	P3	1 FEB	00:50	BE	ROS	US	48° 37.540	126° 20.060	822		47-	1	MB/KE	☒ ☐	
			01:03	BO			48° 37.550	126° 19.990		810	-			☐ ☐	
			01:17	EN			48° 37.540	126° 19.950			-			☐ ☐	
15	P3 → CANY	1	03:31	BE	Loop	-	48° 59.099	126° 14.857	112	5	5015	-	MB	☐ ☐	Loop 100% + 2 CHL
16	RUSSELL	1	08:51	BE	LOOP	-	48° 14.17	126° 05.094	16	4.5	5016	-	MG	☐ ☐	1 SAL 2 CHL

DAILY SCIENCE LOG

Month FEBRUARY			Year 2021			Vessel J P TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
17	Bussell	1	15:23	BE	BOAT	-	49° 13.62	125° 59.27		15m	-	-	GC/MB	☐ ☐	WK STN 5 ^{RET} →
18	CONCEPTION	2	15:40	BE	BOAT	-	49° 39.26	126° 27.83		195	-	-	GC/MB	☐ ☐	WK STN 5 ^{RET} →
19	CONCEPTION	2	15:52	BE	ROS	-	49° 39.27	126° 27.81	193		-	-	MG	☒ ☐	
			15:56	BO			° 39.28	° 27.78		182	-			☐ ☐	
			15:59	EN			° 39.28	° 27.77			-			☐ ☐	
20	CONCEPTION	2	16:18	BE	NET	-	49° 39.26	126° 27.73	192		-		MG	☐ ☐	BOGO
			16:21	BO			49° 39.26	126° 27.71		182	-			☐ ☐	
			16:24	EN			49° 39.25	126° 27.72			-			☐ ☐	
21	ZCN	2	16:50	BE	ROS	-	49° 38.06	126° 29.620	132		-	0	K.S.	☒ ☐	
			16:54	BO			49° 38.11	126° 29.620		127	-			☐ ☐	
			16:57	EN			49° 38.120	126° 29.630			-			☐ ☐	
22	ZCS	2	17:20	BE	ROS	-	49° 36.320	126° 30.910	169		-	0	RF	☒ ☐	
			17:27	BO			49° 36.320	126° 30.870		158	-			☐ ☐	
			17:30	EN			49° 36.320	126° 30.870			-		RF	☒ ☐	
23	CCS	2	18:04	BE	ROS		49° 35.790	126° 35.240	108		-	0	RF	☒ ☐	
			18:07	BO			49° 35.800	126° 35.240		97	-			☐ ☐	
			18:09	EN			49° 35.800	126° 35.240			-			☐ ☐	
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	

EVENT 17
ANDERSON RETURN

49 14.167 126 05.131 0048 UTC

GLENN COOPER MARK BELTON

P35/25

EVENT 22
At 17:43 UTC 20210202, the server computer ~~time~~ was corrected from 2 minutes ahead to correct time (from GPS feed).

EVENT 18

ANDERSON RETURN

49 51.89 126 44.62 2305 UTC 2 FEB

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month <u>FÉVRIER</u>				Year <u>2021</u>			Vessel <u>JA TULLY</u>				Cruise ID <u>2021-001</u>				
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
24	CCN	32	18:39	BE	ROS	US	49° 38.920	126° 36.020	163		48 - 71	24	RF	☒	
			18:43	BO			49° 38.920	126° 36.016		153	-			☐	
			19:02	EN			49° 38.810	126° 35.968			-			☐	
25	TLUPANA	32	20:03	BE	ROS	-	49° 41.58	126° 31.00	265		-	Ø	MR	☒	WRONG CRUISE #
			20:07	BO			49° 41.58	126° 30.99		251	-			☐	IN HEADER UNTIL # 25
			20:12	EN			49° 41.58	126° 30.99			-			☐	
26	HECATE	32	22:17	BE	ROS	-	49° 51.82	126° 44.56	237		-	Ø	MR	☒	
			22:21	BO			49° 51.82	126° 44.56		227	-			☐	
			22:25	EN			49° 51.82	126° 44.55			-			☐	
27	HECATE	32	22:36	BE	NET	UN	49° 51.79	126° 44.57	222		-		MA	☐	BONGO
			22:42	BO			49° 51.80	126° 44.58		217	-			☐	
			22:48	EN			49° 51.81	126° 44.60			-			☐	
28	STEAMER 2	2	23:33	BE	ROS	-	49° 53.16	126° 46.51	~220		-	Ø	MR	☐	WETRO SOUNDING + ALTIMETER
			23:37	BO			49° 53.18	126° 46.57		221	-			☐	
			23:42	EN			49° 53.17	126° 46.60			-			☐	
29	STEAMER 1	3	00:02	BE	ROS	-	49° 54.100	126° 47.580	228		-	Ø	MR	☒	
			00:06	BO			49° 54.110	126° 47.570		217	-			☐	
			00:10	EN			49° 54.100	126° 47.540			-			☐	
			:				°	°			-			☐	

Event Type:

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SET = Fish Set

LOOP = Sea Water Loop
MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter
=

Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
DN = Down / No stop

Time Code:

BE = Beginning Time of Cast
BO = Bottom Time of Cast
EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
MR = Messenger Release Time
RE = Recover Mooring Time

Notes:

Produced by the Water Properties Group, IOS

WaterProperties.ca
Version: 17 Feb 2020

This page is for any notes or observations

EVENT 25

at TLUPANA, 753 goes to pick up new crew members

P45/25

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY / FEVRIER				Year 2021		Vessel JP TULLY				Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments	
							Latitude	Longitude								
30	E1	23	00:41	BE	ROS	US	49° 52.104	126° 50.867	237		-	-	MB	☒ ☐	Sample Not	
			00:45	BO			49° 52.104	126° 50.863	225	→	-			☐ ☐	REFRESHING - RESTARTED → GOOD	
			00:49	EN			49° 52.114	126° 50.879			-			☐ ☐		
31	Loop 31 UNDERWAY	23	01:46	BE	Loop	-	49° 47.915	127° 02.318	38	5	5031	-	MB	☐ ☐	Loop 2xCHL 1xSAL	
32	E1 → P4	3	08:00	BE	Loop	US	48° 55.786	126° 49.092	810	5	5032	-	MG	☐ ☐	1 SAL 2 CHL	
33	P4	3	10:10	BE	Bot FLO	MSG	48° 39.0817	126° 39.999	1323		72-75	4	KS	☐ ☐	TM 75	
			10:27	MR			48° 39.073	126° 40.000		130	-			☐ ☐	BOTS @ 75	
			10:35	EN			48° 39.072	126° 40.002			-			☐ ☐	LAST BOT ON DECK	
34	P4	3	10:54	BE	NET	UN	48° 39.072	126° 40.004	1321		→		MG	☐ ☐	Berigo.	
			11:05	BO			48° 39.073	126° 40.004		250	-			☐ ☐		
			11:09	EN			48° 39.072	126° 40.004			-			☐ ☐		
35	P4	3	12:22	BE	Bot FLOW	MSG	48° 38.995	126° 40.008	1330		76-81	6	KS	☒ ☒	TM 800	
			12:57	MR			48° 38.995	126° 40.007		855	-			☐ ☐	BOTS @ 800	
			13:24	EN			48° 38.993	126° 40.003			-			☐ ☐	last bot on deck.	
36	P4	3	13:33	BE	NET	UN	48° 38.995	126° 39.996	1330		-			☐ ☐		
			14:12	BO			48° 38.994	126° 40.00		1200	→		MG	☐ ☐		
			14:32	EN			48° 38.99	126° 40.00			-			☐ ☐		
			:				°	.			-			☐ ☐		
			:				°	.			-			☐ ☐		

DAILY SCIENCE LOG

Month February / Fevrier			Year 2021			Vessel JP Tully			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
37	P4	3	14:47	BE	ROS	US	48° 38.99	126° 40.01	1327		82 - 100	19	MR	☒	Deep
			15:09	BO			48° 38.99	126° 40.00		1321	-			☐	S 1329 P 1324
			15:48	EN			48° 38.99	126° 40.00			-			☐	A 10 D 1306
38	P4	3	16:47	BE	ROS	US	48° 38.99	126° 40.02	1329		101 - 116	16	MG	☒	DMS to 400
			16:54	BO			48° 39.00	126° 40.03		400	-			☐	
			17:19	EN			48° 39.04	126° 40.21			-			☐	
39	P5	3	19:44	BE	ROS	US	48° 41.540	127° 9.830	2099		117 - 118	2	MG/MS	☒	BULK WATER DMS
			20:18	BO			48° 41.450	127° 9.930		2005	-			☐	HOOP@5M 15AL 20HL
			20:52	EN			48° 41.420	127° 10.000			-			☐	TEST BOTTLE 14@5M
40	P6	3	22:23	BE	ROS	US	48° 44.540	127° 40.000	2564		119 -	1	GC	☒	Test bottle #14 @
			23:55	BO			48° 44.510	127° 40.020		2005	-			☐	Surface no it was
		4	00:27	EN			48° 44.460	127° 40.200			-			☐	replaced.
41	P7	4	02:42	BE	ROS	US	48° 46.620	128° 9.980	2525		120 - 120	1	RF	☒	
			03:19	BO			48° 46.760	128° 10.030		2005	-			☐	
			03:52	EN			48° 46.770	128° 10.160			-			☐	
42	P8	4	06:13	BE	NET	-	48° 48.969	128° 39.945	2536		-	-	MB/RF	☐	Rowco 250
			06:21	BO			48° 48.962	128° 39.990		250	-		GC	☐	
			06:25	EN			48° 48.946	128° 39.969			-			☐	
			:				.	.			-			☐	

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EVENT 39

BOTTLE 14 LEAKING SLIGHTLY, TOP CAP MAYBE NOT SITTING VERY WELL. REPLACED WITH NEW BOTTLE. LANYARD A LITTLE DIFFERENT, TEST HERE @ P6
(206-10-01. NIKTO SERIAL # REPLACED)

EVENT 40

NEW BOTTLE 14 LEAKING, OUTSIDE LANYARD MAYBE TOO TIGHT, REPLACE WITH OLD LANYARD, WATER TESTED LOOKS GOOD.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month February			Year 2021			Vessel Tully			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
43	P8	4	06:33	BE	NET		48° 48.930	128° 39.945	2537		-		MB RF GC	☐ ☐	
			07:10	BO			48° 48.911	128° 39.945		1200	-			☐ ☐	
			07:30	EN			48° 48.906	128° 39.939			-			☐ ☐	
44	P8	4	07:42	BE	ROS	US	48° 48.920	128° 39.850	2537		121 - 144	24	RF	☒ ☐	stop @ 1175db, on downcast due to wire angle. Wind picking up. Resume. →
			08:20	BO			48° 48.820	128° 39.730		2005	-			☐ ☐	
			09:21	EN			48° 48.600	128° 39.470			-			☐ ☐	
45	P8	4	09:42	DE	DRF	—	48° 48.948	128° 39.518	2540	—	-	—	K.S	☐ ☐	A12632-20CA037
46	P9	4	12:14	BE	ROS	US	48° 51.34	129° 09.91	2408		145-147	(1)	MG	☒ ☐	LOOP 5M ISAL 2CHL
			12:46	BO			48° 51.24	129° 09.99		2005	-			☐ ☐	
			13:17	EN			48° 51.18	129° 10.05			-			☐ ☐	
47	P10	4	16:08	BE	ROS	US	48° 53.60	129° 39.88	2670		146-	1	MG	☒ ☐	
			16:42	BO			48° 53.56	129° 39.78		2005	-			☐ ☐	
			17:14	EN			48° 53.51	129° 39.84			-			☐ ☐	
48	P11	4	20:03	BE	ROS	US	48° 56.230	130° 9.760	2770		147-	1		☒ ☐	
			20:38	BO			48° 56.220	130° 9.790		2005	-			☐ ☐	
			21:11	EN			48° 56.190	130° 9.700			-			☐ ☐	
49	P12	5	00:05	BE	ROS	US	48° 58.230	130° 39.720	3252		148 - 163	16	MR	☒ ☐	DRS CAS
			00:12	BO			48° 58.220	130° 39.660		400	-			☐ ☐	
			00:31	EN			48° 58.150	130° 39.610			-			☐ ☐	

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44. All stop again at 1425 bar on downcast, due to wire angle. Winds pushing the ship around.
All stop again at 1296 bar on upcast, due to wire angle. Winds pushing the ship.
" at 3012 bar upcast "

Resume.
Resume.
Resume.

46. Bottle didn't get tripped during cast. Rosette re-deployed to get the sample.

DOWN 10 TO SURFACE TO 5 OOPS!
DID NOT RECORD

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month			Year			Vessel			Cruise ID						
FÉVRIER			2021			JP TULLY			2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
50	P12	5	00:38	BE	NET	-	48° 58.131	130° 39.766	3252		-	-	MB	☐ ☐	Bento
			00:50	BO			° 58.128	° 39.834		250	-			☐ ☐	
			00:53	EN			° 58.143	° 39.829			-			☐ ☐	
51	P12	5	01:44	BE	ROS	US	48° 58.22	130° 40.02	3230		164-186	23	MR/GCMB	☒ ☐	PAR OPP Deep
			02:40	BO			° 58.160	° 40.110		3229	-			☐ ☐	S A P D
			03:59	EN			° 58.220	° 40.270			-			☐ ☐	
52	P12	5	05:05	BE	BOT	MSG	48° 58.187	130° 40.150	3255		187-192	6	KS/MB	☐ ☐	Co-Flu 800
			05:45	BO			° 58.154	° 40.306		855	-			☐ ☐	
			06:21	EN			° 58.127	° 40.314			-			☐ ☐	
53	P12	5	07:14	BE	BOT	MSG	48° 58.202	130° 40.005	3252		193-196	4	KS/MB	☐ ☐	Co-Flu 75
			07:27	BO			° 58.214	° 40.001		130	-			☐ ☐	
			07:45	EN			° 58.209	° 40.010			-			☐ ☐	no 1200 Bongo →
54	P12	5	08:15	BE	DRF	-	48° 58.396	130° 40.298	3250	0	-	0	MG	☐ ☐	Argo #38
55	P13	5	14:15	BE	ROS	US	49° 02.58	131° 40.00	3237		197	1	MG	☒ ☐	Loop@5 1SAL 2CHL
			14:49	BO			° 02.59	° 39.98		2005	Loop 5055			☐ ☐	
			15:20	EN			° 02.53	° 40.14			-			☐ ☐	
56	Loop 56	5	18:20	BE	LOOP	-	49° 05.490	132° 15.855	3201	5	5056	-	CW	☐ ☐	1 SAL, 2 CHL
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)

CTD = Standalone CTD

ROS = CTD in Rosette

SET = Fish Set

LOOP = Sea Water Loop

MOR = Mooring

NET = Plankton Net Haul

DRF = Drifter

— = —

Bottle Firing Method:

US = Up / Stop (default)

UN = Up / No stop

DN = Down / No stop

Time Code:

BE = Beginning Time of Cast

BO = Bottom Time of Cast

EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time

MR = Messenger Release Time

RE = Recover Mooring Time

Notes:

Produced by the Water Properties Group, IOS

WaterProperties.ca

Version: 17 Feb 2020

This page is for any notes or observations

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EVENT 51 → 52

TANK BEGAR AFTER DEEP CAST ~ 1HR

EVENT 53 ELECTRICAL ^{CORD} TO WINCH (BONGO) METER COUNTER. FRIED, NEEDS NEW PLUG IN, NO BONGO BLOWING 40 KT

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month			FEBRUARY			Year		2021		Vessel			JP TULLY			Cruise ID			2021-001		
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments						
							Latitude	Longitude													
57	P14	5	20:09	BE	ROS	US	49° 7.440	132° 39.960	3306		198-221	24	MR	☒							
			21:03	BO			49° 7.385	132° 39.936		3360	-			☐	A=10 D=3305 P=3360 S=3376						
			22:20	EN			49° 7.405	132° 39.976			-			☐							
58	P15	6	03:14	BE	ROS	US	49° 12.000	133° 40.090	3411		222-	1	MR	☒	+Loop 5088 2xchl 1xPAL						
			03:47	BO			49° 11.970	133° 40.300		2005	-			☐							
			04:18	EN			49° 11.890	133° 40.450			-			☐							
60	P16	6	04:49	BE	BOT	MSG	49° 17.082	134° 39.859	3765		223-228	6	KS	☐	TRM 800						
			10:21	MSG			49° 17.055	134° 39.688		855	-			☐							
			10:51	EN			49° 16.969	134° 39.724			-			☐	last bottle off the line						
61	P16	06	11:10	BE	ROS	US	49° 17.01	134° 39.64	3624		229-235	7	MG	☒	HPLC TO 150						
			11:13	BO			49° 16.99	134° 39.60		150	-			☐							
			11:23	EN			49° 16.93	134° 39.59			-			☐							
62	P16	06	13:26	BE	BOT	MSG	49° 16.962	134° 39.764	3766		236-239	3	KS	☐	TM-75						
			13:38	BO			49° 16.921	134° 39.845		130	-			☐							
			13:49	EN			49° 16.904	134° 39.884			-			☐	last bottle off line						
63	P16	06	16:06	BE	ROS	US	49° 16.93	134° 39.96	3633		240-263	24	MG	☒							
			17:04	BO			49° 16.90	134° 40.10		3685	-			☐	A 10 D 3621 P 3685 S 3633						
			18:21	EN			49° 16.84	134° 40.30			-			☐							
			:				°	°			-			☐							

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month February			Year 2021			Vessel IP Tully			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
64	P16	06	18:31	BE	NET		49°16.83	134°40.32	3633	250	—	—	MG	☐ ☐	BONGO
			18:44	BO			°16.90	°40.33			-			☐ ☐	
			18:52	EN			°	°			-			☐ ☐	
65	P16	06	19:04	DE	DRF		49°17.034	134°40.460	3630	—	—	—	KS	☐ ☐	ARGO #35
66	P17	07	00:27	BE	ROS	US	49°20.996	135°39.908	~33m		261-	-	MB	☒ ☐	PAR ON
			00:59	BO			49°20.964	135°39.904		2005	5066-			☐ ☐	+LOOP 5066 2xchl +1SAL
			01:32	EN			49°20.971	135°39.962			-			☐ ☐	
67	P18	07	06:34	BE	ROS	US	49°26.010	136°40.110	3900		265-288	24	RF	☒ ☐	PAR off
			07:39	BO			49°26.040	136°40.650		3890	-			☐ ☐	
			08:57	EN			49°26.220	136°40.690			-			☐ ☐	
68	LOOP68	07	11:17	BE	LOOP	-	49°28.52	137°14.14	2893	5	506-8	-	CW	☒ ☐	1 SAL 2CHL
69	P19	07	13:25	BE	ROS	US	49°30.14	137°39.78	3916		289-	1	MG	☒ ☐	LOOP 1 SAL 2CHL
			13:59	BO			49°30.09	137°39.96		2005	5069-			☐ ☐	
			14:29	EN			49°30.00	137°39.98			-			☐ ☐	
70	P20	07	18:47	BE	BOT	MSG	49°33.954	138°39.91	3955		290-295	6	KS	☐ ☐	TM DEEP
			19:15	MSG			49°33.967	138°40.005		855	-			☐ ☐	
			19:48	EN			49°34.037	138°40.050			-			☐ ☐	last bot H ₂ O off line
			:				°	°			-			☐ ☐	
			:				°	°			-			☐ ☐	

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EVENT 67

TAR OFF, FL NOISE IN MIXED LAYER, REMOVED, DRIED & SPRAYED ELECTRICAL CONDUCTIVITY
SPRAY ON BOTH SIDES OF THE NY CABLE.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month February			Year 2021			Vessel Tully			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
71	P20	07	19:53	BE	NET	-	49° 34.036	138° 40.015	3954		-	-	MB/MA	☐ ☐	BONGO
			20:02	BO			° 34.029	° 40.022		250	-			☐ ☐	
			20:07	EN			° 34.028	° 40.022			-			☐ ☐	
72	P20	07	20:16	BE	ROS	US	49° 34.030	138° 40.020	4025		296-302	7	MB	☒ ☐	HPLC CAST,
			20:18	BO			49° 34.040	138° 40.030		150	-			☐ ☐	PAR ON
			20:28	EN			49° 34.020	138° 40.010			-			☐ ☐	
73	P20	07	20:38	BE	BOT	MSG	49° 34.0138	138° 40.012	3954		303-306	4	K.S	☐ ☐	Co-RO 75
			20:46	BO			49° 34.020	138° 40.065		130	-			☐ ☐	
			20:58	EN			49° 34.013	138° 40.049			-			☐ ☐	
74	P20	07	21:03	BE	NET	-	49° 34.009	138° 40.048	3942		-	-	MA	☐ ☐	BONGO 1200
			21:43	BO			49° 34.014	138° 40.037		1200	-			☐ ☐	
			22:12	EN			49° 34.043	138° 40.067			-			☐ ☐	
75	P20	07	22:58	BE	ROS	US	49° 34.010	138° 39.990	4008		307-330	24	MB	☒ ☐	DEEP CAST PAR OFF
		08	00:05	BO			49° 34.120	138° 40.410		4022	-			☐ ☐	P= 4024 S= 3951 A= 9 D= 3952
		08	01:29	EN			49° 34.120	138° 40.270	4000		-			☐ ☐	
76	P20	08	01:42	DE	DRF	-	49° 34.329	138° 41.280	~4000	-	-	-	MB	☐ ☐	FLOAT ... 039
77	P21	08	05:14	BE	ROS	US	49° 37.987	139° 39.983	3948		331	1	MB	☒ ☐	+ Load 2:52:10AC
			05:50	BO			49° 38.020	139° 40.000		2005	-			☐ ☐	
			06:23	EN			49° 37.958	139° 39.997			-			☐ ☐	

This page is for any notes or observations

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EVENT 74

BONGO STOPPED UP @ BOTTOM (1 ROOM) TO CLEAR GREY WATER FROM TANKS

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month				Year		Vessel			Cruise ID						
FEBRUARY				2021		LP TULLY			2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
78	P22	8	10:06	BE	ROS	US	49°41.958	140°39.976	3980		332-355	24	RF	☒	A=9 P3971 D=3902 S3882
			11:11	BO			49°42.020	140°39.790		3971	-			☐	30 seconds late w/
			12:26	EN			49°41.960	140°39.600			-			☐	archiving command.
79	P22	8	12:41	DE	DRF	—	49°41.96	140°39.85	3890	0	—	—	KS	☐	Argo #28 No plugs
80	P23	08	16:10	BE	ROS	US	49°46.07	141°40.06	4038		356-364	9	MG	☐	PAR ON
			16:42	BO			49°46.17	141°39.97		2005	-			☐	BULK WATER
			17:15	EN			49°46.21	141°39.85			-			☐	PAR OFF
81	LOOP 81	08	18:50	BE	LOOP	—	49°47.69	142°07.80	3908	4.5	5081	—	CW	☐	1 SAL, 2 CHL
82	P24	08	20:39	BE	ROS	US	49°50.152	142°39.997	3976		365-388	24	MB	☒	BUCKET ON
			21:43	BO			49°50.218	142°40.006		41044	-			☐	A=10 P=41044 D=3970 S=3974
			23:11	EN			49°50.204	142°39.929			-			☐	
83	P24	08	23:22	BE	DRF	—	49°50.415	142°40.346	3973	0	—	—	MB	☐	ARGO FLOAT #... OFF
84	P25	9	02:42	BE	ROS	US	50°0.050	143°36.370	4125		389-412	24	MB	☒	FLUSHING EXPERIMENT
			03:16	BO			50°0.210	143°36.310		2005	-			☐	
			04:01	EN			50°0.250	143°36.320			-			☐	
85	P35	9	06:29	BE	ROS	US	50°0.010	144°18.180	4134		413-	1	RF	☒	+LOOP 1 SAL 2 CHL
			07:05	BO			50°0.130	144°18.100		2005	-			☐	
			07:39	EN			50°0.160	144°18.080			-			☐	
			:				°	°			-			☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month February				Year 2021			Vessel TULLY			Cruise ID 2021-001					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
86	P26	09	10:08	BE	BOT	MSG	50°00.02	145°00.11	4237		414-420	7	KS	☒ ☒	TRM 4500
			10:52	MSG			50°00.01	145°00.12		1555	-			☐ ☐	
			11:37	EN			50°00.008	144°59.995			-			☐ ☐	lost bot off the line
87	P26	09	11:48	BE	NET	—	50°00.010	144°59.99	4236		-			☐ ☐	Bongo
			12:08	BO			49°59.972	144°59.898		250	—	—	MG	☐ ☐	
			12:05	EN			49°59.965	144°59.874			-			☐ ☐	
88	P26	09	12:26	BE	BOT		49°59.979	144°59.924	4286		421-427	7	KS	☐ ☐	TRM 200
			12:43	MSG			49°59.985	144°59.944		255	-			☐ ☐	
			12:59	EN			49°59.984	144°59.945			-			☐ ☐	lost bot off line
89	P26	9	13:33	BE	NET	—	50°00.07	145°00.25	4241		—	—	MG	☒ ☒	Bongo
			14:14	BO			49°59.969	144°59.926		1200	-			☐ ☐	
			14:34	EN			49°59.96	144°59.91			-			☐ ☐	
90	P26	9	15:25	BE	BOT	MSG	50°00.00	145°00.02	4233		—	7	KS	☐ ☐	BULK w/ATK
			15:40	MSG			50°00.01	145°00.02		180	-			☐ ☐	
			15:50	EN			50°00.00	145°00.02			-			☐ ☐	
91	P26	9	15:58	BE	ROS	UP	50°00.07	145°00.02	4236		428-434	7	MG	☒ ☐	HPLC
			16:01	BO			50°00.07	145°00.02		150	-			☐ ☐	
			16:10	EN			50°00.06	145°00.02			-			☐ ☐	
			:				°	°			-			☐ ☐	

EVENT 86

- ~20 min of down time due to power loss issues with the winch

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Event 90 BULK WATER - 7 GOFLO'S TO 10M

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month			Year			Vessel			Cruise ID						
FEBRUARY			2021			IP TULLY			2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
92	P26	09	17:11	BE	ROS	US	50° 00.00	145° 00.13	4236		435-458	24	MG	☒	DEEP CAST
			18:18	BO			50° 00.00	145° 00.12		4318	-			☐	A10 4238 P4318 5 4234
			19:51	EN			50° 0 . 010	145° 0 . 130			-			☐	
93	P26	09	20:06	DE	DRF		50° 00.26	144° 59.56	4236		-	-	MA	☐	DEPLOY ALGO 40
94	PA-014	09	21:33	BE	ROS	US	50° 2 . 850	144° 51 . 490	4210		459-461	3	MS	☒	PAR ON?
			21:39	BO			50° 2 . 860	144° 51 . 470		350	-			☐	
			21:46	EN			50° 2 . 860	144° 51 . 490			-			☐	
95	PA-014	09	21:54	BE	NET	-	50° 02 . 86	144° 51 . 49	4210		-	-	MA	☐	BONGO
			22:01	BO			50° 02 . 86	144° 51 . 46		250	-			☐	
			22:05	EN			50° 02 . 86	144° 51 . 43			-			☐	
96	LOOP96	10	12:03	BE	LOOP	-	50° 32.31	141° 02.29	4112	4.5	5096	-	MG	☐	1 SAL 2 CHL
97	LOOP97	10	16:45	BE	LOOP	-	50° 40.77	139° 49.77	4246	4.5	5097	-	MG	☐	1 SAL 2 CHL
98	BLK	10	16:46	BE	BLK	-	50° 40.77	139° 49.77	4246	4.5	-	-	KS	☐	BULK SEA WATER
		10	18:44	EN			50° 47.14	139° 21.11	4095	4.5	-	-		☐	TSS = 32.86‰ 7.2°C
99	LOOP99	11	02:03	BE	LOOP	-	51° 00.04	137° 32.73	4204	4.5	5099	-	MG	☐	1 SAL 2 CHL
100	LOOP100	11	11:50	BE	LOOP	-	51° 17.25	135° 13.35	4342	4.5	5100	-	MG	☐	1 SAL 2 CHL
101	LOOP101	12	12:32	BE	LOOP	-	52° 16.45	130° 39.43	172	4.5	5101	-	MG	☐	1 SAL 2 CHL
			:				°	°			-			☐	
			:				°	°			-			☐	

Event Type:

- BOT = Bottle cast (no CTD)
- CTD = Standalone CTD
- ROS = CTD in Rosette
- SET = Fish Set

LOOP = Sea Water Loop

- MOR = Mooring
- NET = Plankton Net Haul
- DRF = Drifter
- BLK = BULK SEAWATER

Bottle Firing Method:

- US = Up / Stop (default)
- UN = Up / No stop
- DN = Down / No stop

Time Code:

- BE = Beginning Time of Cast
- BO = Bottom Time of Cast
- EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

- DE = Deployment Time
- MR = Messenger Release Time
- RE = Recover Mooring Time

Notes: _____

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EVENT 96/97 CHL TOOK OVER 20 MINUTES TO RUN THROUGH RIG, SUSPECT SOME SORT OF MUCOUS OR ? IN LOOP OILS?
DMQ TOOK ABOUT 34 MINUTES YELLOW → BROWN COLOUR FILTER BUBBLED LUMPY
STIRRED UP FROM SEACHEST? LOTS OF BUBBLING IN CUP

EVENT 100 TSG ADJUSTED FROM 0.8 → 1.0 FLOW RATE WINDS 30-35 KN SEAS 3-4 M
LOOP DMQ 3 MINUTES, CHL TO 21 → 23 MINUTES
DEPTH WAS NOT READING PROPERLY BUT ONLY REALIZED @ 1500 VTC COULD BE 3300 NOT 4300

EVENT 101 AT THE SINK GRADUATED CYLINDER + STOPWATCH
TSG MEASURED FLOW + WAS 1.6 L PER MINUTES SO ADJUSTED FLOW TO 0.5 ON TABLE, MEASURED FLOW @ 1 L PER MINUTE
READING @ 0.8 ON THE OUTPUT ON MONITOR 4

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel JP TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
102	SRN	12	18:32	BE	ROS	-	53° 06.20	130° 23.42	204		-	-	MG	☒	1hr stop @ 51m ↓ 136m
			18:45	BO			53° 06.27	130° 23.64		199	-			☐	1hr stop @ 61 ↑
			18:49	EN			53° 06.35	130° 23.73			-			☐	
103	MT02	12	19:54	BE	ROS	-	53° 2.040	130° 14.820	221		-	-	MB	☒	
			19:59	BO			53° 2.090	130° 14.840		214	-			☐	
			20:03	EN			53° 2.170	130° 14.860			-			☐	
104	MT03	12	21:00	BE	ROS	-	52° 55.556	130° 7.939	248		-	-	RF	☒	
			21:05	BO			52° 55.561	130° 7.916		243	-			☐	
			21:10	EN			52° 55.578	130° 7.939			-			☐	
105	MT04	12	22:07	BE	ROS		52° 49.120	130° 1.226	265		-	-	RF	☒	Windy, corrections for wave lead
			22:14	BO			52° 49.096	130° 1.228		260	-			☐	
			22:19	EN			52° 49.084	130° 1.216			-			☐	
106	HEC1	12	23:08	BE	ROS	US	52° 49.219	129° 50.699			462-475	14	RF	☒	
			23:11	BO			52° 49.223	129° 50.687	125	129	-			☐	
			23:22	EN			52° 49.218	129° 50.648			-			☐	
107	HEC1	12	23:49	BE	NET		52° 49.15	129° 50.43	125		-		MA	☐	Bottom
			23:54	BO			52° 49.15	129° 50.26		120	-			☐	
			23:56	EN			52° 49.15	129° 50.19			-			☐	
			:				.	.			-			☐	

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EVENT 103

- SET TO START ARCHIVING IMMEDIATELY
- STOPS ON WAY DOWN TO CORRECT WIRE ANGLE

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel J P TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/Fl Cleaned	Comments
108	CAM 1	13	01:51	BE	ROS		52° 46.800	129° 30.032	430		-	-	RF	☒ ☐	
			01:59	BO			52° 46.794	129° 30.036	425	425	-			☐ ☐	
			02:07	EN			52° 46.802	129° 29.980			-			☐ ☐	
109	CAM 2	13	03:38	BE	ROS		52° 54.930	129° 15.530	239		-	-	RF	☒ ☐	
			03:43	BO			52° 54.910	129° 15.540		234.6	-			☐ ☐	
			03:48	EN			52° 54.900	129° 15.530			-			☐ ☐	
110	CMP1	13	04:38	BE	ROS		53° 0.406	129° 15.440	365		-	-	RF	☒ ☐	
			04:46	BO			53° 0.403	129° 15.442		360.8	-			☐ ☐	
			04:52	EN			53° 0.433	129° 15.474			-			☐ ☐	
111	SC69	13	05:40	BE	NET		53° 04.820	129° 19.555	685		-	X	MA	☐ ☐	Bongo
			06:00	BO			53° 04.9400	129° 19.443		680	-			☐ ☐	
			06:12	EN			53° 05.107	129° 19.483			-			☐ ☐	
112	SC69	13	06:21	BE	ROS		53° 5.130	129° 19.450	685		476-491	16	RF	☒ ☐	
			06:34	BO			53° 5.160	129° 19.470		678.9	-			☐ ☐	
			07:01	EN			53° 05.31	129° 19.67			-			☐ ☐	
113	HB-GIL	13	08:07	BE	ROS		53° 08.73	129° 21.00	284		-	-	MG	☒ ☐	Sea Mon
			08:13	BO			53° 08.73	129° 21.01		268	-			☐ ☐	
			08:19	EN			53° 08.74	129° 21.03			-			☐ ☐	
			:				°	°			-			☐ ☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel J P TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
114	SC64	13	08:44	BE	ROS	/	53° 08.67	129° 23.43	461		/	/	MG	☒ ☐	SEA LION
			08:54	BO			53° 08.86	129° 23.37		465	-			☐ ☐	
			09:02	EN			53° 08.91	129° 23.35			-			☐ ☐	
115	HB-CAM	13	09:26	BE	ROS	/	53° 08.33	129° 25.12	460		/	/	MG	☒ ☐	NOT QUITE TO STN →
			09:36	BO			53° 08.36	129° 25.11		455	-			☐ ☐	
			09:47	EN			53° 08.35	129° 25.04			-			☐ ☐	STOP @ 350 ↑ 1 MIN
116	HB-OTTER	13	10:32	BE	ROS	/	53° 12.43	129° 29.09	280		/	/	MG	☒ ☐	NOT QUITE TO STN
			10:38	BO			53° 12.43	129° 29.12		277	-			☐ ☐	
			10:43	EN			53° 12.44	129° 29.11			-			☐ ☐	
117	SC61	13	11:14	BE	ROS	US	53° 12.70	129° 25.12	505		492-510	19	MG	☒ ☐	
			11:24	BO			53° 12.76	129° 25.10		501	-			☐ ☐	
			11:47	EN			53° 12.83	129° 25.08			-			☐ ☐	
118	LP53	13	12:30	BE	ROS	/	53° 13.33	129° 23.06	488		/	/	MG	☐ ☐	FORGOT TRANS
			12:38	BO			53° 13.36	129° 23.08		483	-			☐ ☐	
			12:46	EN			53° 13.35	129° 23.05			-			☐ ☐	
119	HB-FIN	13	13:04	BE	ROS	/	53° 14.16	129° 22.73	315		/	/	MG	☒ ☐	
			13:10	BO			53° 14.18	129° 22.75		310	-			☐ ☐	
			13:16	EN			53° 14.17	129° 22.70			-			☐ ☐	
120	HB-FIN	13	15:34	BE	BOAT	/	53° 13.43	129° 22.39	522	0	/	/	MG	☐ ☐	WX STNS →

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EVENT 115, 116 SHORT OF STATION, WIND + CURRENT CAUSING BRIDGE TO SIT OFF A BIT
COMBINATION

FIN IS WX SN BATTERY BROKEN BY FREEZING RETURN TO SHIP FOR REPAIR + ASSESSMENT
EVENT 120 GLENN, MARK + JP LEAVE ON ANDERSON FOR WORK AT FIN ISLAND WEATHER STATION
RETURN: 1656 ALONGSIDE 53 17.23 - 129 23.68 - ON DECK 1702 53 17.17 129 23.73

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel J P TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/Fl Cleaned	Comments
121	SC58	13	16:13	BE	ROS	/	53° 16.63	129° 25.61	521		/	/	MG	☒ ☐	
			16:22	BO			53° 16.69	129° 25.57		516	-			☐ ☐	STOP @ 134 ↑
			16:32	EN			53° 16.77	129° 25.49			-			☐ ☐	
122	DOUG45	13	19:14	BE	BOAT	/	53° 29.55	129° 05.06	165		/	/	SC	☐ ☐	→
123	VP39	13	19:39	BE	ROS	/	53° 30.51	129° 03.65	114		/	/	MG	☒ ☐	
			19:42	BO			53° 30.53	129° 03.62			-			☐ ☐	
			19:44	EN			53° 30.560	129° 3.600			-			☐ ☐	
124	VP39B	13	20:01	BE	ROS	/	53° 31.432	129° 2.809	101		/	/	RF	☒ ☐	
			20:04	BO			53° 31.436	129° 2.788		96.9	-			☐ ☐	
			20:06	EN			53° 31.445	129° 2.773			-			☐ ☐	
125	VP39C	13	20:32	BE	ROS	-	53° 32.414	129° 0.510	55		/	/	RF	☒ ☐	Hydraulic line below end of this cast.
			20:34	BO			53° 32.408	129° 0.500		54	-			☐ ☐	Rosette left hanging on LARS. Recovered.
			20:36	EN			53° 32.423	129° 0.512			-			☐ ☐	Hydraulic leak on aft deck.
			:				° .	° .			-			☐ ☐	
126	Doug02	14	02:00	BE	ROS	VS	53° 57.821	128° 40.978	176		511 512	2	RF	☒ ☐	
			02:03	BO			53° 57.835	128° 40.982		171	-			☐ ☐	
			02:07	EN			53° 57.851	128° 40.972			-			☐ ☐	
			:				° .	° .			-			☐ ☐	
			:				° .	° .			-			☐ ☐	

Event Type:

BOT = Bottle cast (no CTD)
CTD = Standalone CTD
ROS = CTD in Rosette
SET = Fish Set

LOOP = Sea Water Loop
MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter
=

Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
DN = Down / No stop

Time Code:

BE = Beginning Time of Cast
BO = Bottom Time of Cast
EN = End Time of Cast

CTD Transmissometer and Fluorometer to be cleaned before each cast -- do not use Ammonia products

DE = Deployment Time
MR = Messenger Release Time
RE = Recover Mooring Time

Produced by the Water Properties Group, IOS

WaterProperties.ca
Version: 17 Feb 2020

Notes:

This page is for any notes or observations

EVENT 122
RETURN

ANDERSON AWAY WITH GLENN MARK JP

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DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel JPTULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
127	KIT1	14	02:30	BE	ROS	US	53°56.240	128°41.320	207		513 - 523	11	RF	☒	
			02:36	BO			53°56.250	128°41.320		201	-			☐	
			02:48	EN			53°56.250	128°41.330			-			☐	
128	Doug04	14	03:14	BE	ROS	US	53°55.540	128°42.394	219		524 - 534	16	RF	☒	
			03:26	BO			53°55.546	128°42.412		214	-			☐	
			03:33	EN			53°55.595	128°42.474			-			☐	
129	Doug-SA	14	04:03	BE	ROS	-	53°54.971	128°44.041	99108		-	-	RF	☐	A 7.25 S 104-108 P 104.6 D 103
			04:06	BO			53°54.960	128°44.029		104	-			☐	
			04:10	EN			53°54.948	128°44.016			-			☐	
130	Doug-SB	14	04:23	BE	ROS	-	53°54.880	128°43.820	163		-	-	RF	☒	A 4.8 S 163 P 165 D 163
			04:28	BO			53°54.880	128°43.820		165	-			☐	
			04:32	EN			53°54.840	128°43.850			-			☐	
131	Doug-O5	14	04:44	BE	ROS	-	53°54.810	128°43.500	210		-	-	RF	☒	
			04:49	BO			53°54.840	128°43.530		206	-			☐	
			04:54	EN			53°54.810	128°43.530			-			☐	
132	Doug-SD	14	05:07	BE	ROS	-	53°54.677	128°43.080	235		-	-	RF	☐	
			05:12	BO			53°54.682	128°43.046		231	-			☐	
			05:16	EN			53°54.700	128°43.060			-			☐	
			:				°	°			-			☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel J P TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
133	Doug-5E	14	05:29	BE	ROS	-	53°54.565	128°42.836	236		-	-	RF	☒	
			05:34	BO			53°54.605	128°42.859		232	-			☐	
			05:38	EN			53°54.611	128°42.823			-			☐	
134	Doug-11	14	06:36	BE	ROS	VS	53°49.802	128°49.339	332		540-544	5	RF	☒	
			06:43	BO			53°49.793	128°49.297		322	-			☐	
			06:51	EN			53°49.810	128°49.308			-			☐	
135	Doug-12	14	07:21	BE	ROS	-	53°48.209	128°50.407	355		-	-	RF	☒	
			07:28	BO			53°48.229	128°50.432		350	-			☐	
			07:34	EN			53°48.269	128°50.480			-			☐	
136	Doug-12	14	07:47	BE	Net		53°48.318	128°50.388	353		-		MA/MG	☐	BONGO
			07:52	BO			53°48.363	128°50.331		346	-			☐	
			08:00	EN			53°48.406	128°50.250			-			☐	
137	DeC-26	14	09:43	BE	ROS	US	53°34.28	128°51.06	165		545-549 345-349	5	HG	☒	
			09:52	BO			53°34.32	128°51.00		158	-			☐	
			09:59	EN			53°34.33	128°50.96			-			☐	
138	LOUP-138	14	11:55	BE	LOUP	-	53°25.36	128°32.64	216	4.5	5138	-	K.S	☐	1 SAL 2 CHL
139	STANFORTH R	14	16:01	BE	BOAT	-	53°29.19	128°21.36	472	-	-	-	K.S	☐	WX STN SARDINIA CANAL
		15	02:39	EN			53°28.2000	128°22.2402			-		MA/RF	☐	
			:				°	°			-			☐	

This page is for any notes or observations

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EVENT 139 ON ANDERSON GLENN, MARK J.P.

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel JP TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
140	GC74	14	18:44	BE	ROS	US	53° 15.79	127° 55.47	137		550-554	5	KS/MG	☒	
			18:47	BO			53° 15.78	127° 55.47		132	-			☐	
			18:52	EN			53° 15.78	127° 55.48			-			☐	
141	GC68	14	19:40	BE	ROS	/	53° 20.58	127° 59.59	225		/	/	MG/RF	☒	
			19:45	BO			53° 20.590	127° 59.540		221	-			☐	
			19:49	EN			53° 20.590	127° 59.530			-			☐	
142	GC60	14	20:42	BE	ROS	-	53° 25.670	128° 5.420	266		/	/	MA	☐	Spritzer frozen!
			20:51	BO			53° 25.660	128° 5.420		261	-			☐	bring it indoors
			20:57	EN			53° 25.640	128° 5.430			-			☐	
143	GC51	14	22:05	BE	ROS	-	53° 28.300	128° 19.910	498		/	/	RF	☒	
			22:15	BO			53° 28.260	128° 18.880		495	-			☐	
			22:24	EN			53° 28.250	128° 18.890			-			☐	
144	GC51	14	22:47	BE	NET	/	53° 28.260	128° 18.886	499		-	/	MA	☐	Bongo
			23:03	BO			53° 28.194	128° 18.846		494	-			☐	
			23:11	EN			53° 28.149	128° 18.805			-			☐	
145	GC44	15	03:14	BE	ROS	US	53° 25.910	128° 26.990	393		555-559	5	RF	☒	
			03:22	BO			53° 25.900	128° 27.020		3923	-			☐	
			03:31	EN			53° 25.900	128° 27.040			-			☐	
			:				.	.			-			☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month Feb				Year 2021			Vessel Tully			Cruise ID 2021-001					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
							Latitude	Longitude							
146	GC38	15	04:20	BE	ROS	—	53° 27.000	128° 36.060	243		—	—	RF	☒	
			04:25	BO			53° 27.000	128° 36.070		237	-			☐	
			04:30	EN			53° 27.000	128° 36.080			-			☐	
147	GC31	15	05:18	BE	ROS	—	53° 31.540	128° 43.550	207		—	—	RF	☒	
			05:23	BO			53° 31.553	128° 43.580		200	-			☐	
			05:27	EN			53° 31.579	128° 43.607			-			☐	
148	GC28	15	05:49	BE	ROS	—	53° 32.110	128° 46.120	197		—	—	RF	☒	
			05:53	BO			53° 32.110	128° 46.110		1915	-		RF	☒	
			05:57	EN			53° 32.130	128° 46.110			-			☐	
149	GC26	15	06:22	BE	ROS	—	53° 34.020	128° 47.330	170		—	—	RF	☒	
			06:26	BO			53° 34.030	128° 47.310		165	-			☐	
			06:29	EN			53° 34.040	128° 47.290			-			☐	
150	Dec-24	15	07:00	BE	ROS	—	53° 35.958	128° 50.488	173		—	—	RF	☒	
			07:03	BO			53° 35.948	128° 50.471		167	-			☐	
			07:07	EN			53° 35.957	128° 50.444			-			☐	
151	Dec-21	15	07:33	BE	ROS	—	53° 38.330	128° 51.580	237		—	—	RF	☒	A 6 S215 D229 P231
			07:38	BO			53° 38.330	128° 51.600		231	-			☐	Sounder reading off by almost 20m
			07:42	EN			53° 38.330	128° 51.610			-			☐	
			:				.	.			-			☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month Feb			Year 2021			Vessel Tully			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
152	Dec-19	15	08:04	BE	ROS	-	53° 39.10	128° 52.42	268		-	-	MG	☒ ☐	
			08:10	BO			° 39.30	° 52.41		262	-			☐ ☐	
			08:14	EN			° 39.29	° 52.42			-			☐ ☐	
153	DEC-12	15	09:29	BE	ROS	/	53° 46.78	128° 49.45	314		/	/	MG	☒ ☐	
			09:35	BO			° 46.80	° 49.51	319	314	-			☐ ☐	
			09:40	EN			° 46.82	° 49.51			-			☐ ☐	
154	DOUG-12B	15	10:08	BE	ROS	/	53° 48.64	128° 51.36	347		/	/	MG	☒ ☐	was Dec-22 on sheet
			10:14	BO			° 48.66	° 51.37		342	-			☐ ☐	
			10:20	EN			° 48.69	° 51.36			-			☐ ☐	
155	DOUG-16	15	10:48	BE	ROS	/	53° 46.61	128° 54.81	389		560-564	5	MG	☒ ☐	
			10:55	BO			° 46.82	° 54.79		384	-			☐ ☐	
			11:04	EN			° 46.80	° 54.76			-			☐ ☐	
156	EMILIA	15	15:55	EN	BOAT	-	53° 45.39	128° 59.76	260	-	-	-	MG	☐ ☐	RETURN →
157	FOC 1	15	16:22	BE	ROS	US	53° 44.17	129° 01.85	370		565-582	18	MG	☒ ☐	
			16:30	BO			° 44.17	° 01.84		364	-			☐ ☐	
			16:51	EN			° 44.19	° 01.80			-			☐ ☐	
158	Doug-26	15	17:32	BE	ROS	US	53° 40.41	129° 07.34	396		583-606	24	MG	☒ ☐	FLUSHING EXPT
			17:39	BO			° 40.41	° 07.36		388	-			☐ ☐	
			18:02	EN			° 40.42	° 07.32			-			☐ ☐	

This page is for any notes or observations

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EVENT 156 - GLENN, C., MARK, B. WES ON THE ANDERSON

WX STN'S

RETURN 2058 53 28.83 129 12.53 376 M

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY			Year 2021			Vessel J P TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
159	DOUG-29	15	18:47	BE	ROS	/	53° 38.23	129° 11.46	382		/	/	MG	☒	
			18:54	BO			° 38.23	° 11.42	387	382	-			☐	
			19:01	EN			° 38.25	° 11.39			-			☐	
160	DOUG-31	15	19:26	BE	ROS	US	53° 36.75	129° 12.73	307		607 - 611	5	MG	☒	
			19:32	BO			° 36.75	° 12.74			-			☐	
			19:41	EN			° 36.76	° 12.75			-			☐	
161	KSK-1	15	20:38	BE	ROS	-	53° 28.804	129° 12.515	375		-	-	RF	☒	
			20:45	BO			53° 28.801	129° 12.485		370	-			☐	
			20:52	EN			53° 28.812	129° 12.482			-			☐	
162	DOUG-45	15	21:49	BE	Net	/	53° 22.241	129° 11.680	461		-		MA	☐	Bongo
			22:02	BO			53° 22.271	129° 11.670		458	-			☐	
			22:10	EN			53° 22.296	129° 11.698	461		-			☐	
163	DOUG-45	15	22:21	BE	ROS	US	53° 22.262	129° 11.606		457	612 - 616	5	RF	☒	
			22:30	BO			53° 22.259	129° 11.636			-			☐	
			22:40	EN			53° 22.261	129° 11.641			-			☐	
164	HAK-1	16	15:04	BE	ROS	US	51° 42.63	128° 13.71	141		617 - 631	15	MG	☒	
			15:07	BO			° 42.65	° 13.72		135	-			☐	
			15:20	EN			° 42.67	° 13.62			-			☐	
			:				°	°			-			☐	

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month FEBRUARY				Year 2021		Vessel J P TULLY			Cruise ID 2021-001						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Information		Bottom Pressure	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
165	HAKI	16	15:25	BE	NET		51° 42.69	128° 13.90	140		-		MG	☐ ☐	BONGU
			:33	BO			51° 42.67	128° 13.70			-			☐ ☐	
			:36	EN			51° 42.64	128° 13.75			-			☐ ☐	
166	KC10	16	17:29	BE	ROS	US	51° 39.16	127° 57.10	323		632-645	14	MG	☒ ☐	
			17:36	BO			° 39.16	° 57.13		318	-			☐ ☐	FIREBOTS 15-24
			17:54	EN			° 39.17	° 57.15			-			☐ ☐	HYDRAULIC @ 5M POSSIBLE LEAK
167	CPE1	16	22:17	BE	ROS		51° 0.170	127° 49.870	145		/	/	RF	☒ ☐	
			22:20	BO			51° 0.168	127° 49.990		140	-			☐ ☐	
			22:23	EN			51° 0.150	127° 49.940			-			☐ ☐	
168	CPE1	16	22:29	BE	NET		51° 0.148	127° 49.985	145		-		MA	☐ ☐	
			22:35	BO			51° 0.151	127° 50.000		140	-			☐ ☐	
			22:37	EN			51° 0.158	127° 49.987			-			☐ ☐	
169	/	16	23:29		LOOP		50° 53.99	127° 38.14			5169-		RF/MG	☐ ☐	Sample # 5169
170	North Ajax	17	15:01	BE	ROS	/	49° 44.030	124° 46.670	275		/	/	RF	☒ ☐	
			15:07	BO			49° 44.050	124° 46.710		270	-			☐ ☐	
			15:12	EN			49° 44.050	124° 46.730			-			☐ ☐	
			:				° .	° .			-			☐ ☐	
			:				° .	° .			-			☐ ☐	
			:				° .	° .			-			☐ ☐	