

DAILY SCIENCE LOG BOOK

CRUISE
NUMBER

2018-034

DATE:

From: 2 Sept 2018

To: 10 Sept 2018

VESSEL:

J.P. Tully

PROJECT(S):

Laperouse

Water Properties Group
Fisheries and Oceans Canada
Institute of Ocean Sciences
Ocean Sciences Division

WaterProperties.ca

Captain: Kent Reid First Officer: Kevin McKechnie
Second Officer: Simon Clarke Third Officer: Alastair B-H
Fishing Master: _____ Chief Engineer: Stuart Bursaw

Mission Participants / Agencies:

los/osd ; uvic ; Trent University

**** Chief Scientist to complete section below OR cut and tape from cruise plan ****

1st Leg Scientific Personnel: _____
Chief Scientist: Tan Derrick

Name	Watch	Cabin	Name	Watch	Cabin
Marie Robert	Lead Day	A	Tan Perry		D
Maura Galbraith	Day	C			
John Dower	Day	E			
Theresa Venello	Day	G			
Tori Durrett	Day	H			
Nina Nemcek	0800-2000	F			
Hugh McLean	Lead Night	E			
Amanda Timmerman	Night	C			
Robyn Sahara	Night	G			
Hayleigh Rados	Night	H			

2nd Leg Scientific Personnel: _____ **Chief Scientist:** _____

[illegible]

**** 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: Tully laptop

Data acquisition program: Seasave

CTD deck unit make: SPBE model: 11+ serial number: 0425

Primary CTD

Make: SPBE model: 9+ serial number: 585

Primary temperature serial number: 5724

Primary conductivity serial number: 4434

Secondary temperature serial number: 5725

Secondary conductivity serial number: 4448

Transmissometer: Wet labs Model: C-Star s/n: 1185DR

Transmissometer: _____ Model: _____ s/n: _____

Fluorometer: Model Seapoint Cable gain: 3X s/n: 3641 P S or NO pump?

Fluorometer: Model _____ Cable gain: _____ s/n: _____ P, S or NO pump?

Oxygen sensor: SPBE Model: 43 s/n: 1483 P, S or NO pump?

PAR sensor: Parafacical Model: QSP2350 s/n: 70613 Surface PAR? Y/N

Other sensors: Altimeter s/n: 62355 P, S or NO pump?

Other sensors: _____ s/n: _____ P, S or NO pump?

Other sensors: _____ s/n: _____ P, S or NO pump?

Other sensors: _____ s/n: _____ P, S or NO pump?

Secondary CTD

Make: _____ model: _____ serial number: _____

Primary temperature serial number: _____

Primary conductivity serial number: _____

Secondary temperature serial number: _____

Secondary conductivity serial number: _____

Transmissometer: _____ Model: _____ s/n: _____

Transmissometer: _____ Model: _____ s/n: _____

Fluorometer: Model _____ Cable gain: _____ s/n: _____ P, S or NO pump?

Fluorometer: Model _____ Cable gain: _____ s/n: _____ P, S or NO pump?

Oxygen sensor: _____ Model: _____ s/n: _____ P, S or NO pump?

PAR sensor: _____ Model: _____ s/n: _____ Surface PAR? Y/N

Other sensors: _____ s/n: _____ P, S or NO pump?

Other sensors: _____ s/n: _____ P, S or NO pump?

Other sensors: _____ s/n: _____ P, S or NO pump?

Other sensors: _____ s/n: _____ 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 (e.g., W.E. Ricker)

Rosette Setup:

Number of bottles: 24
Manufacturer: 105
Volume of bottles (litres): 10L

Winches:

1. Make: Humboldt Model: _____ Serial #: 17027 Used for: Boat Deck - CTD/Rosette
2. Make: CTD winch Model: _____ Serial #: 17026 Used for: MPS
3. Make: Work winch Model: 329-1482 Serial #: _____ Used for: Bonsole/net tows

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

All worked well. Some grease from Lours crane
dripped onto Rosette late in cruise

Salinometer:

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

Oxygen Kit(s):

Make: SIO Model: _____ Kit Number: #2
Make: _____ Model: _____ Kit Number: _____

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

All worked fine

Thermosalinograph System (SBE21):

Program: SCS Version: _____

Sampling interval (seconds): 5

Fluorometer sensor serial number: 953

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 case done by Hooring Cruise (105) immediately preceding

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 #1 Frame Size: 500 cm Mesh: 236 µm Flowmeter: TSK 7131
Bongo #2 Frame Size: cm Mesh: µm Flowmeter:
Ring net Frame Size: 300 cm Mesh: 64 µm Flowmeter: TSK 4877
Frame Size: cm Mesh: µm Flowmeter:

Multinet BIONESS Neuston Others:

Hydro-Bios Kiel

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 SIMRAD EK60 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

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Month			Year			Vessel			Cruise ID						
SEPT			2018			TULLY			2018-034						
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Depth	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
001	59	02	18:27	BE	ROS	U.S.	48° 36. 94	123° 14. 71	223		1 - 11	11	H.M.	☒ ☐	WRONG CRUISE # IN HEADER
			18:31	BO			48° 36. 96	123° 14. 70			-			☐ ☐	CAUSED -25
			18:45	EN			48° 37. 01	123° 14. 65			-			☐ ☐	
002	HARO 59	02	19:01	BE	NET	✓	48° 36. 91	123° 14. 80	229		-			☐ ☐	Bougo
			19:09	BO			48° 36. 91	123° 14. 73		225	-			☐ ☐	
			19:14	EN			48° 36. 89	123° 14. 70			-			☐ ☐	
003	LB01	3	05:18	BE	ROS	US	48° 40. 38	124° 59. 48	33		20 - 26	5	MR	☒ ☐	
			05:19	BO			48° 40. 38	124° 59. 46		26	-			☐ ☐	
			05:23	EN			48° 40. 38	124° 59. 42			-			☐ ☐	
4	LB02	3	05:48	BE	ROS	US	48° 39. 04	125° 02. 41	56		27 - 31	5	MR	☒ ☐	
			05:50	BO			48° 39. 04	125° 02. 44			-			☐ ☐	
			05:55	EN			48° 39. 05	125° 02. 51			-			☐ ☐	
5	LB03	3	06:22	BE	ROS	US	48° 37. 33	125° 05. 85	92		32 -	1	MR	☒ ☐	
			06:24	BO			48° 37. 33	125° 05. 90		84	-			☐ ☐	
			06:26	EN			48° 37. 33	125° 05. 97			-			☐ ☐	
6	LB04	3	06:50	BE	ROS	US	48° 35. 66	125° 08. 10	110		33 - 39	7	MR	☒ ☐	
			06:53	BO			48° 35. 68	125° 08. 97			-			☐ ☐	
			07:01	EN			48° 35. 64	125° 09. 19			-			☐ ☐	
			:				°	°			-			☐ ☐	

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

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Notes:

This page is for any notes or observations

DIC - TWO SQUIRTS $HgCl$

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Month <u>SEPT</u>			Year <u>2018</u>		Vessel <u>TULLY</u>		Cruise ID <u>2018-34</u>								
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Depth	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/Fl Cleaned	Comments
7	E1	3	07:54	BE	CTD	—	48° 31.60	125° 03.84	115		—	0	H.M.	☒	
			07:56	BO	ROS		48° 31.70	125° 03.89		107	-			☐	
			07:58	EN			48° 31.71	125° 03.92			-			☐	
8	E1	3	08:08	BO	NET		48° 31.79	125° 04.13	117		-		H.M.	☐	31.76N Surface 04.06 W Lat/Long
			8:10	EN			48° 31.80	125° 04.19		105	-			☐	BONGO
9	LB 05	3	08:55	BE	ROS	U.S.	48° 34.08	125° 11.96	102		40-	1	H.M.	☐	
			08:57	BO			48° 34.10	125° 12.00		9	-			☐	
			09:00	EN			48° 34.10	125° 12.07			-			☐	
10	LB06	3	09:28	BE	ROS	U.S.	48° 32.12	125° 15.54	113		41-48	8	H.M.	☒	—
			09:31	BO			48° 32.14	125° 15.59		105	-			☐	
			09:40	EN			48° 32.17	125° 15.75			-			☐	
11	C1	3	10:20	BE	CTD	—	48° 28.91	125° 15.30	151		—	—	H.M.	☒	FL = 5.49
			10:23	BO	ROS		48° 28.93	125° 15.35		142	-			☐	
			10:26	EN			48° 28.94	125° 15.37			-			☐	
12	C1	3	10:31	BE	NET	—	48° 28.94	125° 15.42	151		-		A.T.	☐	BONGO
			10:36	BO			48° 28.95	125° 15.49		140	-			☐	
			10:39	EN			48° 28.97	125° 15.53			-			☐	
			:				°	°			-			☐	
			:				°	°			-			☐	

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Bottle Firing Method:

US = Up / Stop (default)
UN = Up / No stop
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Time Code:

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

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Notes:

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BOTTLE 7 - SILICON TUBING BROKEN - REPLACED WITH SPRING FROM NISKIN 23 - #23 REPLACED WITH SILICON TUBING
FOR R. HAMME @ LING P

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Month <u>SEPTEMBER</u>				Year <u>2010</u>		Vessel <u>TULLY</u>				Cruise ID <u>2018-34</u>					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Depth	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/Fl Cleaned	Comments
13	C2	3	11:34	BE	CTD ROS	✓	48° 26.15	125° 09.13	158		✓	✓	H.m	☐ ☒	
			11:36	BO			48° 26.16	125° 09.15		151	-			☐ ☐	
			11:39	EM			48° 26.16	125° 09.18			-			☐ ☐	
14	C2	3	11:42	BE	NET	✓	48° 26.18	125° 09.23	158		-		HR/AT	☐ ☐	BONGO
			11:48	BO			48° 26.21	125° 09.29		148	-			☐ ☐	
			11:51	EM			48° 26.26	125° 09.31			-			☐ ☐	
15	C3		12:54	BE	NET	✓	48° 23.38	125° 20.73	121		-		AT	☐ ☐	BONGO
			12:59	BE			48° 23.40	125° 20.71		111	-			☐ ☐	
			13:00	EM			48° 23.40	125° 20.71			-			☐ ☐	
16	C3		13:09	BE	CTD ROS	✓	48° 23.41	125° 20.69	121		-	0	H.m	☐ ☒	
			13:11	BO			48° 23.41	125° 20.69		113	-			☐ ☐	
			13:14	EM			48° 23.40	125° 20.70			-			☐ ☐	
17	LB07		13:58	BE	ROS		48° 28.68	125° 22.03	155		49-	1	H.m	☐ ☐	
			14:01	BO			48° 28.69	125° 22.04		147	-			☐ ☐	
			14:05	EM			48° 28.68	125° 22.05			-			☐ ☐	
18	LB07		14:10	BE	NET		48° 28.69	125° 22.06	155		-			☐ ☐	
			14:12	BO			48° 28.71	125° 22.10		145	-			☐ ☐	
			14:15	EM			48° 28.72	125° 22.14			-			☐ ☐	
			:				°	°			-			☐ ☐	

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Month <u>SEPTEMBER</u>				Year <u>2018</u>			Vessel <u>TULLY</u>				Cruise ID <u>2018-34</u>				
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Depth	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
19	B8	3	15:18	BC	CTD ROS	/	48° 34.51	125° 29.97	115		/	/	H.M.	☐ ☒	
			15:20	BO			48° 34.51	125° 29.96		105	-			☐ ☐	
			15:22	EN			48° 34.51	125° 29.96			-			☐ ☐	
20	B8	3	15:26	BE	NET	/	48° 34.50	125° 29.98	115		/	/	A.T.	☐ ☐	BONGO
			15:30	BO			48° 34.50	125° 29.99		105	-			☐ ☐	
			15:32	EN			48° 34.51	125° 30.02			-			☐ ☐	
21	B7	3	16:12	BE	CTD ROS		48° 31.99	125° 35.45	78	68	-			☐ ☐	BONGO ?
			16:14	BO			48° 31.99	125° 35.46			-			☐ ☐	
			16:15	EN			48° 31.99	125° 35.46			-			☐ ☐	
22	B7	3	16:19	BC	NET	/	48° 31.99	125° 35.48	78		-		A.T.	☐ ☐	BONGO
			16:22	BO			48° 31.99	125° 35.51		68	-			☐ ☐	
			16:23	EN			48° 32.00	125° 35.51			-			☐ ☐	
23	LBO8	3	17:25	BC	NET	/	48° 25.32	125° 28.57	140		-			☐ ☐	BONGO
			17:29	BO			48° 25.34	125° 28.58		130	-			☐ ☐	
			17:31	EN			48° 25.35	125° 28.59			-			☐ ☐	
24	LBO8	3	17:42	BC	NET		48° 25.34	125° 28.62	150		-			☐ ☐	RING NET
			17:46	BO			48° 25.36	125° 28.65		140	-			☐ ☐	
			17:50	EN			48° 25.38	125° 28.66			-			☐ ☐	
			:				°	°			-			☐ ☐	

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25	LB08	3	18:01	BE	ROS		48° 25.34	125° 28.55	140		50 - 60	11	RIP/HM	☒	
			18:04	Bo			48° 25.34	125° 28.55	141	130	-	11	RIP/HM	☐	
			18:17	EN			48° 25.36	125° 28.54			-		"	☐	
26	LB09	3	18:59	BE	ROS	US	48° 22.08	125° 34.68	149		61 - 69	9	MR	☒	
			19:03	Bo			48° 22.08	125° 34.66		142	-			☐	
			19:12	EN			48° 22.10	125° 34.52			-			☐	
27	LB10	3	19:57	BE	ROS	US	48° 18.55	125° 41.32	151		70 -	1	MR	☒	
			20:00	Bo			48° 18.55	125° 41.32		144	-			☐	
			20:03	EN			48° 18.54	125° 41.32			-			☐	
28	LB11	3	20:54	BE	NET		48° 15.19	125° 47.72	205		-		MG	☐	
			21:01	Bo			48° 15.20	125° 47.75		200	-			☐	
			21:06	EN			48° 15.20	125° 47.77			-			☐	
29	LB11	3	21:13	BE	ROS	US	48° 15.22	125° 47.73	203		71 - 81	11R	MR	☒	
			21:17	Bo			48° 15.22	125° 47.72		195	-			☐	
			21:30	EN			48° 15.24	125° 47.74			-			☐	
30	LB12	3	22:03	BE	ROS	US	48° 12.90	125° 51.86	505		82 - 97	16	MR	☒	
			22:12	Bo			48° 12.91	125° 51.88		500	-			☐	
			22:34	EN			48° 12.91	125° 51.87			-			☐	
			:				.	.			-			☐	

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

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Notes:

→ AFTER LB10: Reset lap time back by 3 min

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SEPT				2018			TULLY			2018-034					
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Depth	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
31	LB13	3	23:09	BE	ROS	US	48° 10.61	125° 56.10	910		98-	1	MR/RIP	☒ ☐	Splice in 200 ~ 600 ↓
			23:25	Bo	bo		48° 10.65	125° 56.07	904	908	-			☐ ☐	
			23:42	EN			48° 10.68	125° 56.04			-			☐ ☐	
32	LB14	4	00:15	Bo	ROS	US	48° 08.53	125° 59.91	1170		99-116	18	MR/RIP	☒ ☐	Splice in 200 below ~ 750 LOTS ↑ 250 + 100
			00:37	Bo			48° 08.54	125° 59.89	1161	1177	-			☐ ☐	
			01:14	EN			48° 08.59	125° 59.86			-			☐ ☐	
33	LB15	4	02:10	Bo	ROS	US	48° 04.36	126° 08.43	1538		117-	1	MR	☒ ☐	B 1530 S 1533 D 1530 A 10
			02:37	Bo			48° 04.40	126° 08.44			-			☐ ☐	Spikes 200 ↑
			03:04	EN			48° 04.39	126° 08.43			-			☐ ☐	
34	LB16	4	04:01	Bo	ROS	US	48° 00.52	126° 16.94	1795		118-	1	MR	☒ ☐	Stopped @ 125 ↓ TO FLX WIRE ANGLE
			04:34	Bo			48° 00.53	126° 16.93		1830	-			☐ ☐	
			05:03	EN			48° 00.53	126° 16.92			-			☐ ☐	
35	LB16	4	05:12	Bo	NET	UN	48° 00.55	126° 16.96	1789		-		MR	☐ ☐	Bongos
			05:22	Bo			48° 00.55	126° 16.92		250	-			☐ ☐	
			05:26	EN			48° 00.55	126° 16.92			-			☐ ☐	
36	LB16	4	05:53	BE	NET	UN	48° 00.50	126° 16.89	1784		-			☐ ☐	1200 Bongos
			06:34	Bo			48° 00.65	126° 17.21		1200	-			☐ ☐	
			06:53	EN			48° 00.71	126° 17.36			-			☐ ☐	→
37	LB16/LC12	4	07:59		LOOP		48° 06.22	126° 26.36			5037-	-		☐ ☐	Loop: 2chl, 1sl

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 NET = Plankton Net Haul
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 =

Bottle Firing Method:

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Notes:

Time Code:

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This page is for any notes or observations

Event 3b - 1200m Bongo delayed by A frame power loss ~ 30 mins.

→ GREASED O₂ CONNECTIONS TO TRY AND ELIMINATE SPIKES
(x3)

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month SEPTEMBER				Year 2018			Vessel TULLY				Cruise ID 2018-34				
Event Number	Station Name	Day	Time (UTC)	Time Code	Event Type	Firing Method	Positional Latitude	Information Longitude	Bottom Depth	Max Cast Pressure	Sample Serial Numbers	# of Bottles	Watch Keepers	Trns/FI Cleaned	Comments
38	LC 12	4	09:38	BC	ROS	✓	40° 14. 79	126° 39. 82	2514		✓	0	H.M.	☐ ☒	TSG Flow = 1.1
			10:21	BO			48° 14. 84	126° 40. 33		2533	-			☐ ☐	→
			11:05	EN			48° 14. 86	126° 40. 45			-			☐ ☐	
39	LC 12	4	11:12	BC	NET	✓	48° 14. 87	126° 40. 40	2506		✓			☐ ☐	BONGO
			11:21	BO			48° 14. 89	126° 40. 45		250	-			☐ ☐	
			11:25	EN			48° 14. 89	126° 40. 49			-			☐ ☐	
40	LC 12	4	11:35	BC	NET	✓	48° 14. 87	126° 40. 48	2507		-			☐ ☐	BONGO DECP
			12:13	BO			48° 15. 04	126° 40. 71		1206	-			☐ ☐	
			12:33	EN			48° 15. 25	126° 40. 68			-			☐ ☐	
41	LC 11	4	13:51	BC	ROS	VS	48° 18. 94	126° 26. 71	1500?		119 - 137	19	H.M.	☐ ☒	→
			14:16	BO			48° 18. 99	126° 26. 91		1476	-			☐ ☐	
			14:58	EN	ROS		48° 19. 09	126° 27. 14			-			☐ ☐	
42	LC 10	4	15:45	BC	CTD		48° 22. 40	126° 20. 17	1237		✓	✓	H.M.	☐ ☒	TSG = 1.1
			16:06	BO			48° 22. 40	126° 20. 17		1240	-			☐ ☐	
			16:27	EN			48° 22. 40	126° 20. 18			-			☐ ☐	
43	LC 09	4	17:10	BC	NET	✓	48° 25. 92	126° 13. 66	600		✓			☐ ☐	Bongo
			17:19	BO			48° 25. 94	126° 14. 67		250	-			☐ ☐	
			17:23	EN			48° 25. 94	126° 13. 67			-			☐ ☐	
			:				°	°			-			☐ ☐	

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→ OPENED 3 O_2 CONNECTIONS AND SPRAYED ELECTRICAL CLEANER IN FEMALE PLUGS & REGREASED MALE PINS

→ O_2 TRACE IS MUCH CLEANER NOW

EVENTS 42 TO ⁵⁷~~49~~ HAVE AN EXTRA SPACE BEFORE . HEX

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month <u>SEPTEMBER</u>				Year <u>2018</u>			Vessel <u>TULLY</u>			Cruise ID <u>2018-34</u>					
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44	LC09	4	17:34	BE	NET		48°25.94	126°13.69	600		-			☐ ☐	Ring
			17:43	BO			48°25.96	126°13.69		250	-			☐ ☐	
			17:47	BN			48°25.97	126°13.69			-			☐ ☐	
45	LC09	4	17:55	BE	ROS	V.S	48°25.95	126°13.67	598		138-155	18	H.M+	☐ ☒	
			18:05	BO			48°25.95	126°13.66			-			☐ ☐	
			18:31	EN			48°25.90	126°13.65			-			☐ ☐	
46	A2	4	19:23	BE	ROS		48°22.68	126°03.79	350		-	Ø	MR	☒ ☐	
			19:29	BO			48°22.69	126°03.78		348	-			☐ ☐	
			19:35	EN			48°22.69	126°03.77			-			☐ ☐	
47	A2	4	19:42?	BE	NET		48°22.69	126°03.81	349		-		MG	☐ ☐	BONGO
			19:50	BO			48°22.70	126°03.82		250	-			☐ ☐	
			19:54	EN			48°22.71	126°03.83			-			☐ ☐	
48	LC08	4	20:53	BE	ROS	US	48°29.44	126°07.03	197		156-166	11	MR	☒ ☐	
			20:57	BO			48°29.42	126°07.01		189	-			☐ ☐	
			21:11	EN			48°29.34	126°06.93			-			☐ ☐	
49	LC08	4	21:17	BE	NET		48°29.32	126°06.95	197		-		AT	☐ ☐	BONGO
			21:24	BO			48°29.33	126°07.05		190	-			☐ ☐	
			21:28	EN			48°29.32	126°07.06			-			☐ ☐	
50	PRESSURE READ	4	21:56	BE			48°31.69	126°02.93			-			☐ ☐	1 MIN ON DECK

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