

DAILY SCIENCE LOG BOOK

MISSION
NUMBER

2013-01

DATE:

From:

Feb 5/13

to:

19 FEBRUARY 2013

VESSEL:

J.P. Tully

PROJECT(S):

LINE P

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

WaterProperties.ca

Rosette Setup:

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

Winches:

1. Make: _____ Model: _____ Serial #: _____ Used for: _____
2. Make: _____ Model: _____ Serial #: _____ Used for: _____
3. Make: _____ Model: _____ Serial #: _____ Used for: _____

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

Salinometer:

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

Oxygen Kit(s):

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

Thermosalinograph System (SBE21):

Program: Seaswe Version: SN 3363
Sampling interval (seconds): 30
Fluorometer sensor serial number: _____

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:

Guide to cable terminations:

Date of cable termination: _____

Please read and complete this form before reterminating cable. We have two standard CTD cables in use, nominal .316" and .322". This form specifically addresses these two cables; however, the same considerations apply to using other cables. The specifications for non-standard cables and associated terminations are available from Tom Juhász, IOS room 1221, phone 250.363.6598.

Please identify nominal cable diameter:

322 Winch: LARS

Actual diameter measurements, two locations in triplicate at termination and approximately 5 metres back from termination.

At cable end:

1. 320
2. 322
3. 320

at 5 metres:

1. 321
2. 320
3. 320

For comparison, the outer armour measurements of new cable:

Nominal .316" should be .3155 to .3165"

Nominal .322" should be .318 to .326"

Record specifications for other cables: _____ within: _____

The tolerance of the PMI Evergrip termination is tighter and only cables within these limits should be used.

For nominal .316" cable the lowest possible diameter is .309"

For nominal .322" cable the lowest possible diameter is .321"

Describe cable:

Kinks: _____

Birdcage _____

Rust flaking off cable _____

Cable round or oval _____

Does cable have loose outer armour? _____

(Raised wires or space between wires.)

Are outer armour wires flattened? _____

Remove cable that exhibits these signs of deterioration. To be authorised by Chief Scientist of the

cruise or the winch shop, Phil Lobb at 250.363.6799.

(flaking, not just looks rusty)

Megger results by conductor (should be greater than 10,000. meg ohms)

Inner armour to conductor 1 _____

Inner armour to conductor 2 _____

Inner armour to conductor 3 _____

Please identify PMI sleeve used by checking the appropriate blank:

For .316" cable, diameter of inner dimension of sleeve should be .3265" _____

part number 9004897-13, cable diameter range .309" to .320". _____

For .322" cable, diameter of inner dimension of sleeve should be .3400" _____

part number 9004897-14, cable range .321" to .333". _____

Sliding the sleeve onto the cable should be difficult.

Evergrip helical Rods:

The part number is 9005-9002 and covers left hand lay cables of diameter range .309" to .333".

Presence of grit on inner surface (yes / no) _____

Condition of wires (damaged ends?) _____

Are the wires rusted? _____

Comments:

CABLE SNAPPED @ WINCH WHILE ROSETTE WAS
HANGING OVER WATER - SNAPPED WHEN COMPRESSING SPRINGS
TO UNDOG - LUCKILY DOGS WERE STILL ENGAGED WHEN
CABLE SNAPPED - WIRE UNNECESSARILY LOADED THE NIGHT BEFORE
WHEN DOGS HUNG UP AND ROSETTE DROPPED 2' IN AIR
HUGH

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Page 1 of

Month <u>FEBRUARY</u>				Year <u>2013</u>			Ship <u>TULLY</u>				Cruise ID <u>2013-01</u>				
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
6	SI03	0335	BE	ROS	US	1	48° 35.60	123° 30.00	225				MR/TF	✓	
		0341	BO				48° 35.59	123° 30.02		215	1-7	7			
		0353	EN				48° 35.59	123° 30.06							
6	JF1	0934	BE	USW		2	48° 16.13	123° 29.94	151		—		H.M.		
6	JF2	1135	BE	USW		3	48° 17.96	123° 59.59	184		—		H.M.		
6	JF3	1344	BE	USW		4	48° 26.93	124° 29.75	224		—		H.M.		
6	JF4	1603	BE	USW		5	48° 32.25	124° 59.60	55		—		H.M.		
6	P1		BE	ROS		6			115		8-10	3	H.M.	✓	CANCELLED
			BO												Too ROUGH
			EN												DMS CAST
6	P2	2138	BE	ROS	US	6	48° 36.17	125° 59.91	118					✓	
		2140	BO				48° 36.19	125° 59.89		100	11-24	14	MR		
		2154	EN				48° 36.24	125° 59.82							
6	P2	2236	BE	ROS	US	7	48° 35.99	125° 59.86	118?				MR	✓	DEEP CAST
		2239	BO				48° 35.99	125° 59.86		105	25-32	8			
		2248	EN				48° 36.03	125° 59.80							
7	P3	0053	BE	ROS	US	8	48° 37.50	126° 19.76	810?						
		0107	BO				48° 37.54	126° 19.67		786	33-34	2	MR	✓	
			EN				48° 37	126° 19							

Cast Type:

BOT = Bottle cast, no CTD
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ROS = Rosette plus CTD
SET = Fish Set

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

Bottle Firing Method:

US = Up / Stop
UN = Up / No stop
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Notes:

Time Code:

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Transmissometer to be cleaned before each cast, do not use Ammonia products

Produced by the Water Properties Group, IOS

WaterProperties.ca
Version: 06 March 2008

DAILY SCIENCE LOG

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Month FÉVRIER				Year 2013			Ship TULUY				Cruise ID 2013-01				
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
7	P5	0642	BE	ROS	US	9	48° 41.55	127° 09.93	2090		35-36	2	MR/HM	✓	PAR OFF
		0720	BO				48° 41.54	127° 09.74		2005					NO LOOP
		0806	EN				48° 41.43	127° 09.53							
7	P6	1142	BE	ROS	U.S.	10	48° 44.57	127° 39.99	2146		37-38	2	H.M.	✓	Loop P6
		1221	BO				48° 44.50	127° 40.01		2005					
		1257	EN				48° 44.37	127° 39.88							
7	P7	1601	BE	ROS	U.S.	11	48° 46.74	128° 10.34	2511		39-40	2	H.M.	✓	Loop P7
		1644	BO				48° 46.78	128° 10.48		2005					
		1724	EN				48° 46.60	128° 10.48							
7	P8	2010	BE	NET	✓	12	48° 49.01	128° 39.91	2522	250	—	—	H.M.		BONGO
		2022	BO				48° 48.97	128° 39.90							
		2028	EN				48° 48.95	128° 39.92							
7	P8	2055	BE	ROS	US	13	48° 48.90	128° 39.84	2522		41-64	24	TF	✓	
		2130	BO				48° 48.89	128° 39.58		2003					
		2228	EN				48° 48.82	128° 38.84			65-66	2	TF	✓	
8	P9	1:17	BE	ROS	US	14	48° 51.40	129° 09.29	2350						
		0152	BO				48° 51.35	129° 09.68		2036					
		02:31	EN				48° 51.25	129° 09.92							

✓

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

Month <u>FEBRUARY</u>				Year <u>2013</u>			Ship <u>J.P. TULLY</u>				Cruise ID <u>2013-01</u>				
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
8	P10	05:09	BE	ROS	US	15	48°53.54	129°40.00	2645		67-68	2	TF	✓	
		05:45	BO				48°53.33	129°40.40		2005					
		06:22	EN				48°53.23	129°40.69							
8	P11	0854	BE	ROS	US	16	48°56.00	130°10.02	2754		69-70	2	H.M.	✓	
		0932	BO				48°55.94	130°10.00		2005					
		1007	EN				48°55.95	130°10.00							
8	P12	1246	BE	ROS	US	17	48°58.26	130°39.86	3230		71-82	12	H.M.	✓	UBC CAST
		1320	BO				48°58.26	130°39.80		2005					
		1358	EN				48°58.29	130°39.83							
8	P12	1430	BE	TM Pump		18	48°58.26	130°39.92	3230		83-85		KS/H.M.	-	T.M. PUMPS
		1435	BO				48°58.26	130°39.92		40					
		1548	EN				48°58.25	130°39.88							
8	P12	1555	BE	BOT		19	48°58.25	130°39.87	3230		86-89	4	KS/H.M.		Go-FLO's - OSCA
		1634	BO				48°58.26	130°39.79		1000					MESSENGER DOWN
		1705					48°58.26	130°39.80							
8	P12	1715	BE	BOT		20	48°58.26	130°39.80	3230		90-93	4	KS/H.M.		SHALLOW Go FLO's
		1730	BO				48°58.28	130°39.83		200					
		1754	EN				48°58.29	130°39.90							

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Month <u>FEBRUARY</u>				Year <u>2013</u>			Ship <u>J. P. TULLY</u>			Cruise ID <u>2013-01</u>					
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
8	P12	1818	BO	NET		21	48° 58.25	130° 40.21	3230	250			H.M.		BONGO
		1821	EN				48° 58.24	130° 40.27	-						
8	P12	1847	BE	ROS	U.S.	22	48° 58.20	130° 40.06	3231		94-116	23	H.M./TF	✓	DEEP ROSETTE
		1930	BO				48° 58.19	130° 40.04		3260					
		2053	EN				48° 58.19	130 40.05							
8	P12	2220	BE	ROS		23	48° 58.18	130 39.92	3231		117-133	17	TF	✓	PAR ON DMS CAST
			BO							300					
		2250	EN				48 58.16	130 39.91							
8	P12	2259	DE	DR F		24	48° 58.28	130° 39.958					MR		PAR OFF S/N 62 MetOcean
9	P13		BE	ROS	US	25	49° 02.60	131° 39.79	3239		134-135	2	TF	✓	
		04:46	BO				49° 02.56	131° 39.775		2005					
		05:23	EN				49° 02.518	131° 39.805							OVER →
9	P14	1014	BC	ROS	US	26	49° 07.44	132° 39.97	3312		136-137	2	H.M.	✓	LOOPS TAKEN
		1046	BO				49° 07.40	132° 39.92		2005					
		1115	EN				49° 07.41	132° 39.89							
9	P15	1556	BE	ROS	US	27	49° 12.06	133° 39.95	3401		138-143	6	H.M.	✓	LOOPS TAKEN
		1627	BO				49° 12.05	133° 39.95		2005					
		1702	EN				49 12.13	133° 40.06							

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SET = Fish Set

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Notes: _____

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Version: 06 March 2008

This page is for any notes or observations

RELEASE MECHANISM REPLACED - #13 POSITION BROKEN / BOTTLE #24 REPLACED

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month <u>February</u>				Year <u>2013</u>			Ship <u>TULLY</u>				Cruise ID <u>2013-01</u>				
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
9	P16	22:12	BO	ROS	US	28	49°17.040	134°39.992	3624		144-160		TF	✓	PAR ON
		22:17	BO				49°17.010	134°39.970		300					
		22:39	EN				49°17.010	134°39.870							PAR OFF
9	P16	23:07	BO	NET		29	49°16.880	134°39.970	3623	250			TF/crews		Bongo h 250
		23:12	EN				49°16.858	134°39.996							
9	P16	2329	BO	ROS	US	30	49°16.88	134°40.04	3622		161-184	24	MR/TF	✓	Deep Cast
10		0040	BO				49°16.83	134°40.04		3680					
		02:11	EN				49°16.831	134°40.04							
10	P16	03:40	BE	PUMP	-	31	49°17.00	134°39.85	3621	40m	185-187	-	TF/KS	-	Pump KS
10	P16	04:04	BE	GO FLO	msg.	32	49°16.99	134°39.86	3622	100m	188-191	-	TF/KS		GO FLO
10	P16	05:00	BE	X-Nisk	msg.	33	49°16.99	134°39.86	3624	200m	192-195	-	TF/KS		X Niskus
		06:30	EN				49°16.99	134°39.86							
10	P17		BO	ROS	US	34	CANCELLED BROKEN WIRE				196-203	8	H.M.		DEEP SALINITY SAMPLE
			BO							2005					RETERMINATE
			EN												
10	P18	1626	BE	ROS	U.S.	35	49°26.05	136°40.00	4024						+loops ??
		1655	BO				49°26.07	136°39.99		2005	196-203	8	H.M.	✓	REALLY DEEP SALT SAMPLE
		1734	EN				49°26.07	136°40.02							
10	P18	1741	BE	DRF	-	36	49°26.16	136°40.22	4024				MR		SN 60 METOCCEAN

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 =

Bottle Firing Method:

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Transmissometer to be cleaned before each cast, do not use Ammonia products

Produced by the Water Properties Group, IOS

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 Version: 06 March 2008

DAILY SCIENCE LOG

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Month February			Year 2013			Ship Tully			Cruise ID 2013-01						
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
10	P19	22:11	BE	ROS	US	36	49° 30.041	137° 40.105	3912		208-209	2	TF	✓	
		22:42	BO				49° 30.053	137° 40.114		2005					
		23:21	EN				49° 30.090	137° 40.057							
11	P21	08:15	BE	ROS	US	37	49° 38.06	139° 39.98	3941		210-211	2	H.M.	✓	Loops TAKEN
		08:59	BO				49° 38.03	139° 39.95		2005					
		09:39	EN				49° 38.00	139° 40.05							
11	P22	14:08	BE	ROS	US	38	49° 42.58	140° 39.43	3844		212-213	2	H.M.	✓	Loops TAKEN
		14:46	BO				49° 42.58	140° 39.32		2005				✗	MISSED ONE CHL
		15:20	EN				49° 42.60	140° 39.37							
11	P23	21:32	BE	ROS	US	39	49° 46.22	141° 40.051	4032		214-237	24	TF	✓	
		22:01	BO				49° 46.282	141° 40.007		2005					
		22:48	EN				49° 46.279	141° 40.031							
11	P23	22:51	DE	DRF		40	49° 46.28	141° 40.10							EC DEPTR Argo float
12	P26	19:28	BE	ROS	US	41	49° 59.99	145° 00.02	4226		268-284	17	H.M.	✓	DRS CAST PARON
		19:35	BO				49° 59.93	145° 00.07		300					
		19:55	EN				49° 59.97	144° 59.99							
12	P24	20:33	BE	ROS	US	42	50° 00.10	144° 59.99	4226		244-267	24	MR/TF	✓	PAC OFF
		21:57	BO				50° 0.010	144° 59.987		4315					
		23:48	EN				50° 0.010	144° 59.990							

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							Latitude	Longitude							
12	P26	21:08	BE	BOAT		43					600		TF		
		21:30	EN												
13	P26	0026	DE	DRF		44	50°04'08"	145°04'99"							Met Ocean SW 61
13	P26	0033	DE	DRF		45	50°04'05"	145°05'28"							CG 015
13	P26	0047	DE	DRF		46	50°04'12"	145°05'43"							CG 014
13	P26	0134	DE	DRF		47	50°04'06"	145°05'08"							UW 8390
13	P26	0136	DE	DRF		48	50°04'05"	145°05'13"							UW 6881
13	P26	02:54	BE	PUMP		49	50°00'01"	144°59'98"	4225	90 m	285-287		TF/KS		
		03:53	EN				50°00'01"	144°59'97"							
13	P26	04:48	DE	GOPLO deep		50	50°00'05"	144°59'37"	4225	1005	288-291		TF/KS		
	P26		EN	GOPLO shallow			50°00'0135"	144°59'979"	4225	205	292-295		TF/KS		
13	P26	05:30	BE			51	50°00'15"	144°59'98"							
		06:30	EN				50°00'01"	144°59'98"							
13	P26	06:32	BE	ROS	US	52	50°00'020"	144°59'990"	4225		296-307		TF		VBC cast
		07:07	BO				50°00'022"	144°59'992"		2005					
		0742	EN				50°00'020"	144°59'992"							
13	P26	0843	BO	NCT		53	49°59'67"	145°00'50"	4225	250			llm		Bot AQ
		0845	EN				49°59'67"	145°00'50"							

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							Latitude	Longitude							
13	P26	0942	BE	ROS	U.S.	54	50° 02.24	144° 55.81	4209		308-310	3	H.M/TF	✓	ONAR 1
	PA006	0952	BO				50° 02.24	144° 55.81		500					
		1005	EN				50° 02.24	144° 55.81							
13	P26	1015	BE	NET		55	50° 02.26	144° 55.81	4208				H.M.		PEEP BONGO
	PA006	1158	EN				50 02.29	144° 55.81		1000					
13	PA006	1207	BE	ROS	U.S.	56	50 02.29	144 58.81	4211		311-312	2	TF	✓	ONAR 2
		1209	BO				50 02.29	144 55.81		20					
		1212	EN				50 02.29	144 55.81							
13	P35	1502	BE	ROS	US	57	50° 00.14	144° 18.19	4127		242-243	2	H.M	✓	
		1539	BO				50° 00.11	144° 18.18		2005					
		1615	EN				50° 00.16	144° 18.11							
13	P25	1858	BE	ROS	US	58	50° 00.01	143° 36.23	4125		313-319	6	H.M	✓	with pH / LOOPS TAKEN
		1930	BO				50° 00.03	143° 36.13		2005					
		2010	EN				49° 59.99	143 36.09							
14	P26	00:07	BE	ROS	US	59	49° 50.198	142 40.040	3991		319-320	2	TF	✓	
		00:38	BO				49° 50.203	142 40.062		2005					
		01:24	EN				49° 50.209	142 40.068							
14	P20	1859	BO	NET		60	49° 34.06	138° 39.99							
		1909	EN				49° 34.07	138° 39.98							

This page is for any notes or observations

→ see following page!

DAILY SCIENCE LOG

Ocean Sciences Division, Institute of Ocean Sciences

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Month <u>FEBRUARY</u>				Year <u>2013</u>			Ship <u>TULLY</u>				Cruise ID <u>2013-01</u>				
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
14	P20	1931	BG	ROS	US	61	49°34.05	138°39.99	3947		321-337	17	H.M.	✓	DMS CAST / PRR ON
		1939	BO				49°34.05	138°39.99		300					
		20:02	EN				49°34.048	138°39.989							PRR OFF
14	P20	20:43	BE	ROS	US	62	49°34.048	138°39.994	3947		338-361	24	T.F.	✓	Deep Cast
		21:43	BO				49°34.048	138°39.992		4018					
		2322	EN				49°34.050	138°39.990							
15	P20	00:28	BE	PUMP	-	63	49°34.12	138°39.97	3950	40m	362-364	-	TF/KS	-	TM pump
		00:55	BO												Delayed b/c looking
		02:16	EN				49°34.12	138°39.95							for 2nd Fall arrest
15	P20	02:16	BE	GO-PLD	msg.	64	49°34.12	138°39.95	3950	1000m	365-368	4	TF/KS		Deep TM cast
		02:40	BO				49°34.12	138°39.95		1000m					msg set 02:40
		03:19	EN				49°34.16	138°40.03							
15	P20	03:20	BE	X-N:slu	msg.	65	49°34.16	138°40.03	3950	200m	369-372	4	TF/KS		TM shallowcast
		03:35	BO				49°34.16	138°40.03		200m					
		03:51	EN				49°34.16	138°40.03							
15	P17	21:39	BE	ROS	US	66	49°21.100	135°40.030	3592		373-374	2	TF		Samples in BT level 2
		21:58	BO				49°21.060	135°40.010		1005					all others closed on the way up
		22:22	EN				49°21.060	135°39.880							
16	P16	02:33		LOOP		67	49°16.1062	134°33.3227	3665		loop 67		TF		chl + Sal loop sample Labeled as Loop 64

Cast Type:

BOT = Bottle cast, no CTD
CTD = CTD without Rosette
ROS = Rosette plus CTD
SET = Fish Set

USW = Sea Water Loop

MOR = Mooring
NET = Plankton Net Haul
DRF = Drifter

— = —

Bottle Firing Method:

US = Up / Stop
UN = Up / No stop
DN = Down / No stop

Notes: —

Time Code:

BE = Beginning Time of Cast
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DE = Deployment Time
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RE = Recover Mooring Time

Transmissometer to be cleaned before each cast, do not use Ammonia products

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Version: 06 March 2008

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Month <u>February</u>				Year <u>2013</u>			Ship <u>Tully</u>			Cruise ID <u>2013-01</u>					
Day	Station Name	Time (UTC)	Time Code	Cast Type	Firing Method	Event Number	Positional Information		Bottom Depth	Max Depth	Sample Numbers	# of Bottles	Watch Keepers	Trans. Cleaned	Comments
							Latitude	Longitude							
16	P13.5	12:14		LOOP		68	49° 04.16	132° 31.99	2653		Loop 68		HM		herbivores loop 65
16	P11.5	21:24		Loop		69	48° 57.19	129° 52.05	2575		Loop 69		TF		chl + sal loop sample
17	P7.5	03:14		Loop		70	48° 57.35	128° 21.23	2479		Loop 70		TF		" " "
17	P4	12:04	B6	ROS	U.S.	71	48° 39.03	126° 39.98	1317		375-386	12	H.M.	✓	UBC CAST
		12:29	B6				48° 39.03	126° 39.98		1250					
		12:55	EN				48° 39.01	126° 40.01							
17	P4	13:29	B6	NET		72	48° 39.01	126° 39.98	1318	250			H.M.		BONGO
		13:41	EN				48° 38.98	126° 39.98			428-430				
17	P4	13:54	B6	PUMP		73	48° 38.34	126° 40.12	1330		425-428		H.M. KS		Pump
		15:13	EN							40					
17	P4	15:52	B6	ROS	U.S.	74	48° 39.25	126° 40.39	1318		387-410	24	H.M.	✓	DEEP CAST
		16:17	B6				48° 39.25	126° 40.39		1319					
		17:01	EN				48° 39.25	126° 40.39							
17	P4	18:05	B6	ROS	U.S.	75	48° 39.25	126° 40.39	1318		411-427	17	H.M.	✓	DMS CAST / PAP ON
		18:10	B6				48° 39.25	126° 40.39		300					
		18:30	EN				48° 39.25	126° 40.39							
17	~P2	21:10		USW		76	48° 36.46	126° 01.56	122		Loop 76		TF		
17	Np1	14:53		USW		77	48° 34.79	125° 35.12	102		Loop 77		TF		

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