

R/V AKADEMIK PROJECT F2001-042

INSTITUTE FOR EXPLORATION – ECHO SIDE SCAN SONAR SURVEY – GRAVITY CORING

PORT OF OPERATIONS: VARNA, BULGARIA

DATES OF OPERATIONS: AUGUST 16 – 29, 2001

CHIEF SCIENTISTS: PETKO DIMITROV
BULGARIAN ACADEMY OF SCIENCES – INSTITUTE OF OCEANOLOGY

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INSTITUTE FOR EXPLORATION
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KATIE MCCLURE, FLORIDA STATE UNIVERSITY
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DMITRI DIMITROV – BAS-IO
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CRUISE OBJECTIVES

- Collect side-scan sonar data along submerged paleoshorelines off the Bulgarian and Romanian coast on the western Black Sea continental shelf
- Search for ancient shipwrecks and potential submerged terrestrial archaeological sites
- Characterize the seabed morphologies and subseafloor strata using side-scan sonar and subbottom profiling
- Collect sediment gravity cores along ancient shoreline features and in the Black Sea anoxic zone
- Analyze the cores, subsample for radiocarbon dating of mollusks
- Reconstruct the pre-flood paleo-landscape of the Black Sea shelf
- Identify targets for future submersible investigation and sampling

APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH

1. General Information

1.1 Cruise name and/or number:		Black Sea 2001 Sonar Survey - F2001-042
1.2 Sponsoring institution(s):		
Name	Address	Name of Director
Institute for Exploration		
1.3 Scientist in charge of the project:		
Name:	Robert Ballard	
Country:		
Affiliation:	Institute for Exploration	
Address:	55 Coogan Boulevard Mystic,	
Telephone:	8605725955	
Email:	rballard@ife.org	
1.4 Entity(ies) /Participant(s) from coastal State involved in the planning of the project:		
Name:	See Section 6.2.	
Country:		
Affiliation:		
Address:		
Telephone:		
Fax:		
Email:		
Website (for CV and photo):		

2. Description of Project

2.1 Nature and objectives of the project:
conduct a sonar survey in the Black Sea. This is a cooperative project with the Bulgarian Academy of Sciences, based in Varna, Bulgaria. Although vessel to be used is Bulgarian, because project is U.S.-funded and principal investigator is U.S. scientist, Embassy was advised that request must be made by the United States on his behalf.
2.2 Relevant previous or future research projects:
2.3 Previous publications relating to the project:

3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude, including coordinates of cruise track/ way points):
3.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical areas of the intended work and, as far as practicable, the location and depth of sampling stations, the tracks of survey lines, and the locations of installations and equipment. Chart provided - see Section 10.1.

4. Methods and Means to be Used

4.1 Particulars of vessel:	
Name:	AKADEMIK
Type/Class:	Ship
Nationality (Flag state):	Bulgaria
Identification Number (IMO/Lloyds No.):	
Owner:	
Operator:	
Overall length (meters):	180.00
Maximum draught (meters):	15.70
Displacement/Gross tonnage:	1225.00
Propulsion:	
Cruising:	
Maximum speed:	
Call sign:	LZDA
INMARSAT number and method and capability of communication (including emergency frequencies):	2182 kHz and VHF
Name of master:	
Number of crew:	18
Number of scientists on board:	21

4.2 Other craft in the project, including its use:
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4.3 Particulars of methods and scientific instruments:		
Types of samples and measurements	Methods to be used	Instruments to be used

4.4 Indicate nature and quantity of substances to be released into the marine environment:
yes

4.5 Indicate whether drilling will be carried out. If yes, please specify:
yes

4.6 Indicate whether explosives will be used. If yes, please specify type and trade name, chemical content, depth of trade class and stowage, size, depth of detonation, frequency of detonation, and position in latitude and longitude:
yes

4.7 Indicate whether protected species be studied. If yes, please specify:
yes

5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and anticipated timeframe for recovery, locations and depth, and measurements):
yes

6. Dates

6.1 Expected dates of first entry into and final departure from the research area by the research vessel and/or other platforms:
Project Start Date: Aug 15, 2001
Project End Date: Aug 31, 2001

6.2 Coastal State-specific details:		
Coastal Area	Estimated Entry Date	Estimated Departure Date
Bulgaria	Aug 15, 2001	Aug 31, 2001
Explanation of multiple entries: N/A		
Research will be performed: within 12 nm		
Extent to which Bulgaria will be enabled to participate or to be represented in the research project:		
Name, affiliation and contact information for all participants from Bulgaria:		
Coastal Area	Estimated Entry Date	Estimated Departure Date
Romania	Aug 15, 2001	Aug 31, 2001
Explanation of multiple entries: N/A		
Research will be performed: within 12 nm		
Extent to which Romania will be enabled to participate or to be represented in the research project:		
Name, affiliation and contact information for all participants from Romania:		

7. Port Calls

No port calls

8. Participation of the representative of the coastal State

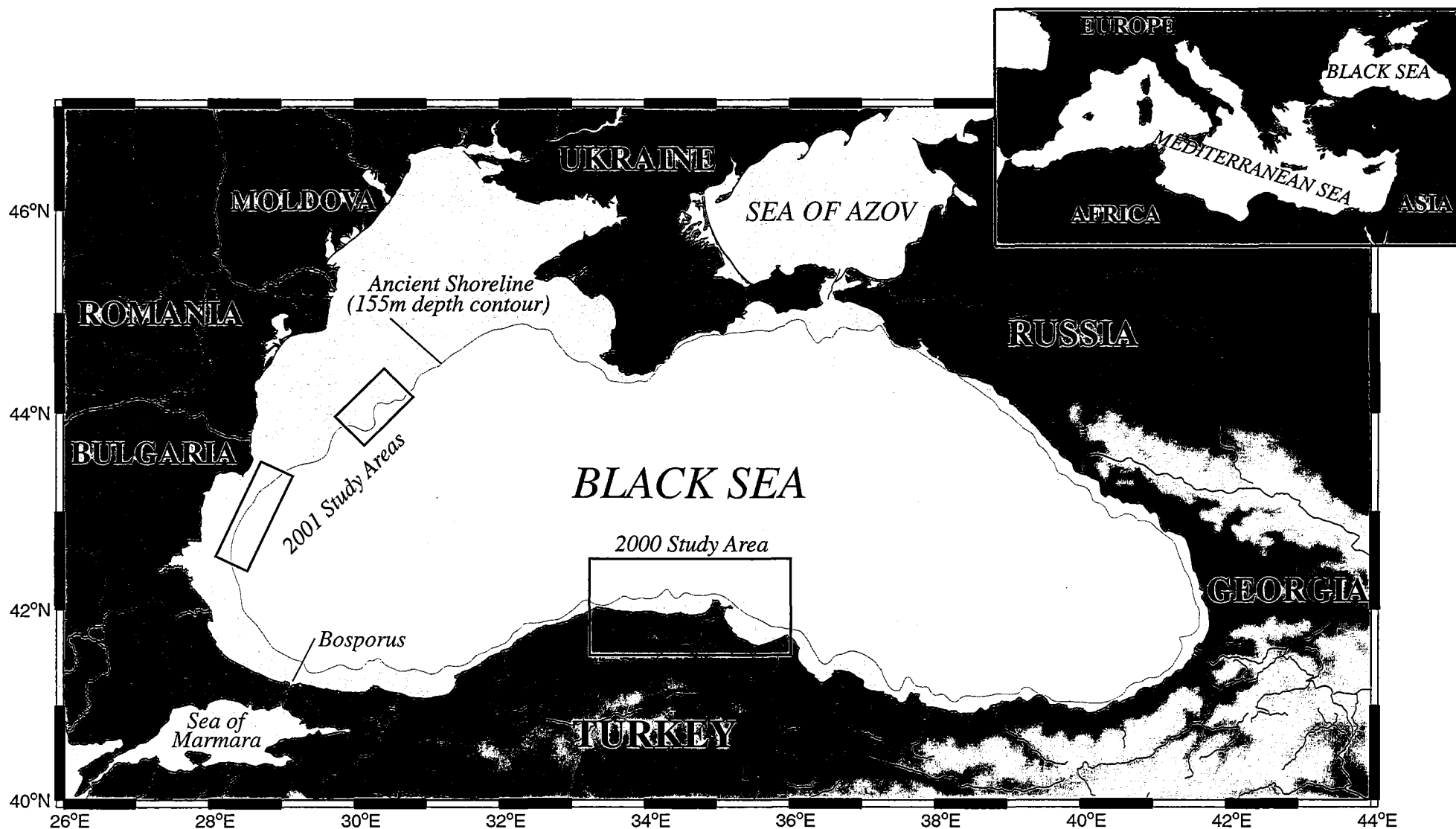
8.1 Modalities of the participation of the representative of the coastal State in the research project: See Section 6.2.
8.2 Proposed dates and ports for embarkation/disembarkation: See Section 6.2.

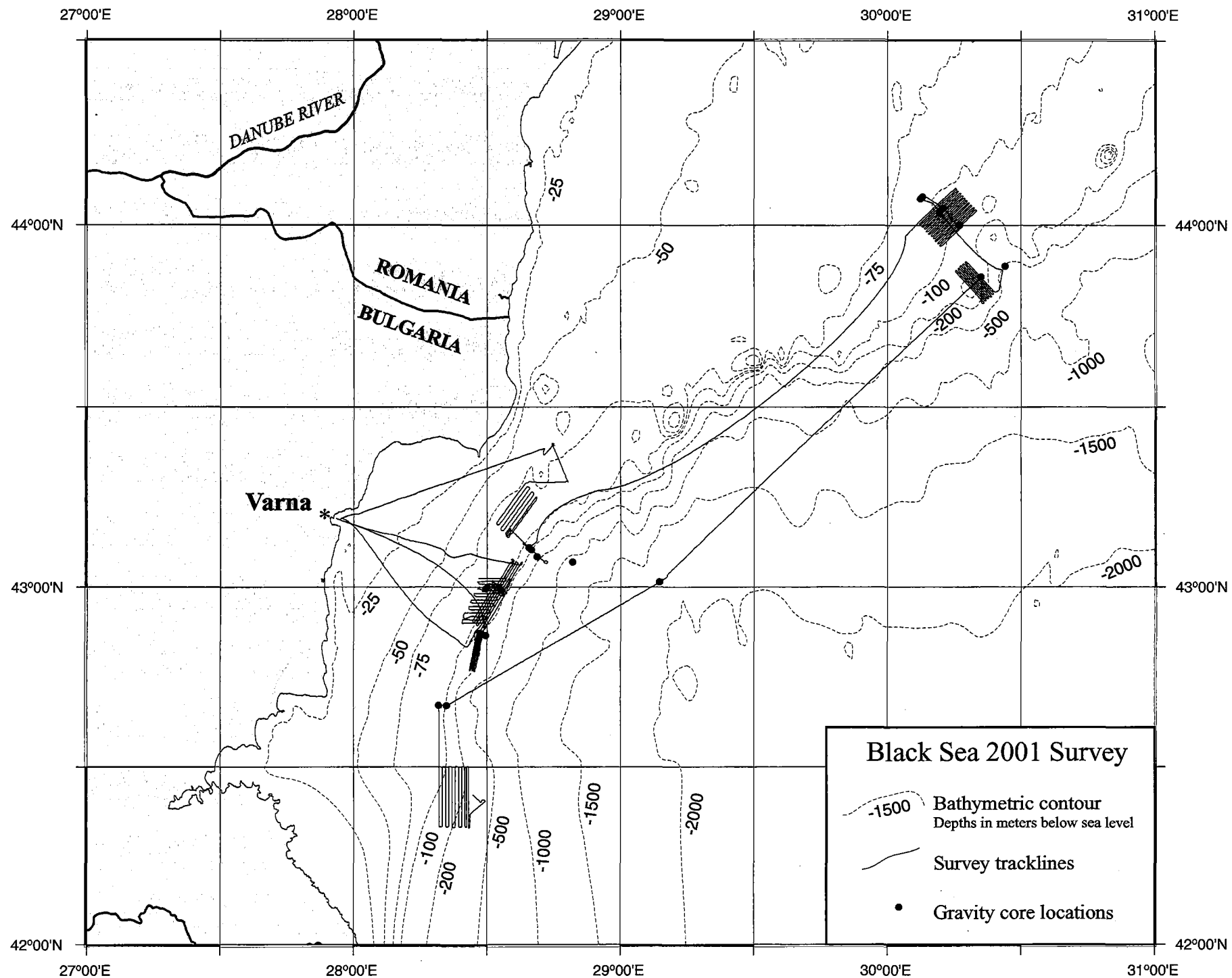
9. Access to Data, Samples and Research Results

9.1 Expected dates of submission to coastal State of preliminary report, which should include the expected dates of submission of the data and research results: No more than 60 days from the end date of the research as provided in Section 6.1.
9.2 Anticipated dates of submission to the coastal State of the final report: No more than 2 years from the end date of the research as provided in Section 6.1.
9.3 Proposed means for access by coastal State to data (including format) and samples: Data will be provided through official channels at no cost to the coastal State(s). Samples will be provided upon request.
9.4 Proposed means to provide coastal State with assessment of data, samples and research results: Assessment of data, samples and research results will be provided at no cost to the coastal State(s).
9.5 Proposed means to provide assistance in assessment or interpretation of data, samples and research results: Assistance in further assessment or interpretation will be provided upon request.
9.6 Proposed means of making results internationally available:

10. List of Supporting Documentation

10.1 List of attachments, such as additional forms required by the coastal State, etc.:			
Attachment Type	Description	Attachment	Submission Date
No Attachments Currently Available			





“Black Sea – Noah – 2001” Expedition

16-29 August 2001

West part of the Black Sea

Geographic coordinates of investigated area: Latitude: 44°06'N - 42°20'N , Longitude: 028°00.'E - 030°24'E

List of Core locations

Station No	Date	Time (GMT)	Latitude	Longitude	Depth m	Length of core cm	Explanations
AB1	16 August	11:15	43°04.200N	028°49.220E	1111	110	CTD station till 500 m
AB2(1)	18 August	13:15	42°59.770N	028°29.750E	84	10	Under the sediments there are Beach rock
AB2(2)	18 August	15:05	42°59.770N	028°29.750E	84	30	Under the sediments there are Beach rock
AB3	18 August	17:00	42°59.540N	028°33.070E	145	133	
AB4	19 August	11:30	42°52.100N	028°29.600E	115	153	Accident
AB5	22 August	17:45	43°06.260N	028°39.890E	500	130	CTD station till 500 m
AB6	22 August		43°05.0636N	028°41.1673E	570	162	
AB7	22 August		43°06.5900N	028°39.360E	140	160	Finish of Provadiyska river submerged valley polygon
AB8	25 August		44°04.6472N	030°07.7733E	90	33	Begin Danube delta polygon. CTD station.
AB9	25 August		44°04.3733N	030°07.3609E	85	80	CTD station
AB10	25 August		44°02.5900N	030°12.1206E	140	74	CTD station
AB11	25 August		44°02.0320N	030°11.6894E	120	45	CTD station
AB12	25 August		44°02.8300N	030°12.580E	115	32	CTD station
AB13	25 August		44°00.0987N	030°16.1837E	350	350	CTD station
AB14	25 August		43°53.2900N	030°26.4200E	784	355	Diatomic ooze with gas structures. CTD station
AB15	26 August		43°51.5329N	030°20.9826E	117	240	Finish of Danube delta polygon
AB16	27 August		43°00.8700N	029°08.6700E	1629	235	Begin cape Emine polygon
AB17	27 August		42°40.3513N	028°20.9182E	120	270	
AB18	27 August		42°40.3596N	028°19.1361E	90	100	Last core from cape Emine polygon

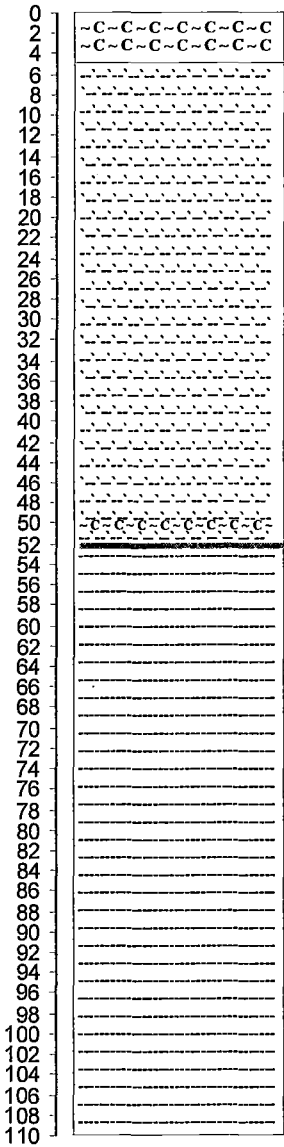
Core AB - 1

08.16.2001

42° 58,57 N

028° 46,80 E

Z = 1111 m



Coccolithic ooze, greenish gray, microlaminated, microbanded
HI³

Sapropelic mud, dark and brounish green with a coccolithic
seam
HI²

Lacustrine clay, gray
Ne

110 cm

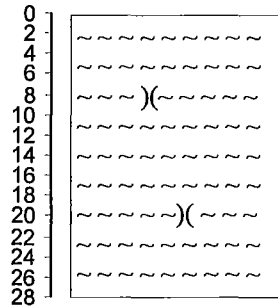
Core AB - 2

08.18.2001

42° 59,33 N

028° 29,00 E

Z = 84 m



28 cm

Greenish gray, silty clayey mud with dispersed shells of Molluscs and their fragments (the modern fauna is predominated: *Mytilus galoprovincialis*, *Abra*, *Modiolus phaseolinus*, *Triphon muricatus* etc.)
HI

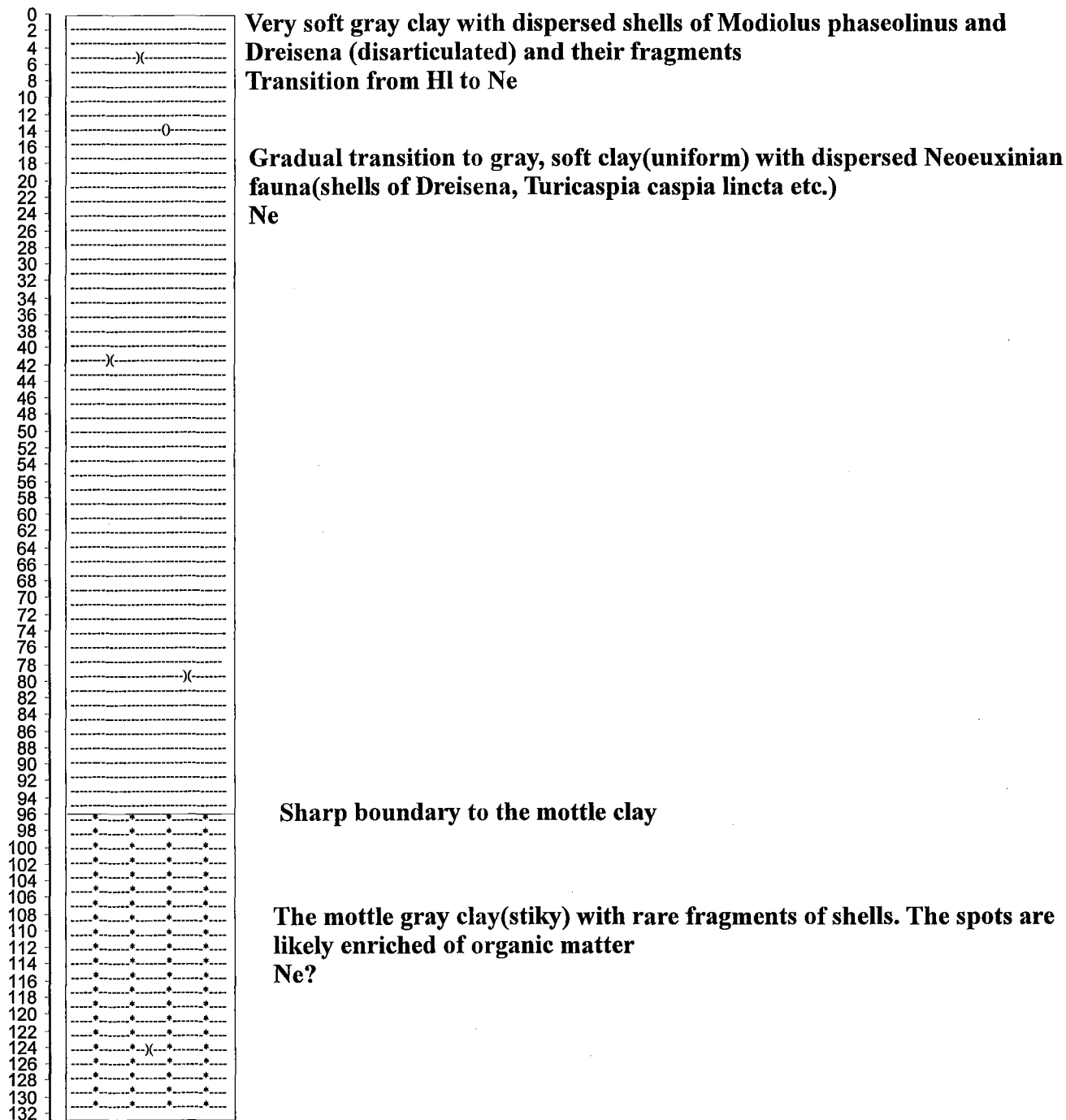
08.18.2001

Core AB - 3

42° 59,3715 N

028° 33,3992 E

Z = 143,5 m



133 cm

Z = 500 m

0	~C~C~C~C~C~C~C~C~C~C~
2	C~C~C~C~C~C~C~C~C~C~
4	~C~C~C~C~C~C~C~C~C~C~
6	C~C~C~C~C~C~C~C~C~C~
8	~C~C~C~C~C~C~C~C~C~C~
10	C~C~C~C~C~C~C~C~C~C~
12	~C~C~C~C~C~C~C~C~C~C~
14	C~C~C~C~C~C~C~C~C~C~
16	~C~C~C~C~C~C~C~C~C~C~
18	C~C~C~C~C~C~C~C~C~C~
20	~C~C~C~C~C~C~C~C~C~C~
22	C~C~C~C~C~C~C~C~C~C~
24	~C~C~C~C~C~C~C~C~C~C~
26	C~C~C~C~C~C~C~C~C~C~
28	~C~C~C~C~C~C~C~C~C~C~
30	C~C~C~C~C~C~C~C~C~C~
32	~C~C~C~C~C~C~C~C~C~C~
34	C~C~C~C~C~C~C~C~C~C~
36	~C~C~C~C~C~C~C~C~C~C~
38	C~C~C~C~C~C~C~C~C~C~
40	~C~C~C~C~C~C~C~C~C~C~
42	C~C~C~C~C~C~C~C~C~C~
44	~C~C~C~C~C~C~C~C~C~C~
46	C~C~C~C~C~C~C~C~C~C~
48	~C~C~C~C~C~C~C~C~C~C~
50	C~C~C~C~C~C~C~C~C~C~
52	~C~C~C~C~C~C~C~C~C~C~
54	C~C~C~C~C~C~C~C~C~C~
56	~C~C~C~C~C~C~C~C~C~C~
58	C~C~C~C~C~C~C~C~C~C~
60	~C~C~C~C~C~C~C~C~C~C~
62	C~C~C~C~C~C~C~C~C~C~
64	~C~C~C~C~C~C~C~C~C~C~
66	C~C~C~C~C~C~C~C~C~C~
68	~C~C~C~C~C~C~C~C~C~C~
70	C~C~C~C~C~C~C~C~C~C~
72	~C~C~C~C~C~C~C~C~C~C~
74	-----
76	-----
78	-----
80	-----
82	-----
84	-----
86	-----
88	-----
90	-----
92	-----
94	-----
96	-----
98	+++++
100	-----
102	-----
104	-----
106	-----
108	-----
110	-----
112	-----
114	-----
116	-----
118	-----
120	-----
122	C~C~C~C~C~C~C~C~C~C~
124	-----
126	C~C~C~C~C~C~C~C~C~C~
128	-----
130	-----

Greenish gray coccolithic ooze, microlaminated
HI³

Green dark green sapropelic mud
HI²

A diatomic seam - 3mm

Green dark green sapropelic mud microlaminated microbanded with 4 coccolithic seams

130 cm

Core AB - 6

028° 41,1673 E

Z = 570 m

0		
2		
4	C~C~C~C~C~C~C~C~C~C	Greenish gray coccolithic ooze
6		HI ³
8		
10	C~C~C~C~C~C~C~C~C~C	
12		
14	C~C~C~C~C~C~C~C~C~C	
16		Sharp boundary
18		
20		
22		Dark green sapropelic mud
24		HI ²
26		
28		
30		
32		
34		
36		
38		
40		
42		Sharp boundary - Sapropel / Fresh water clay
44		
46		
48	*****	
50		
52	*****	
54		
56		
58	*****	
60		
62	*****	
64		
66		
68	*****	
70		
72		
74	*****	
76		
78	*****	
80		
82		
84	*****	
86		Gray clay with light microorganic seams
88		Ne
90	*****	
92		
94	*****	Gray clay with heavy organic seams
96		
98	*****	
100		
102		
104		
106		Gray clay
108		
110		
112	*****	Light organic seams in gray clay
114		
116	*****	
118		
120		
122	*****	
124		
126		
128	*****	Gradual transition
130		
132	*****	
134		Gray clay with intercalated organic seams
136	*****	
138		
140		
142	*****	
144		
146	*****	
148		
150		
152		Gradual transition
154		
156		Gray clay with seam(160 cm) enriched of organic matter
158		

Core AB - 7

08.22.2001

43° 06,590 N

028° 39,360 E

Z = 140 m

~ 5 cm with semiliquid to very soft modern deposits with *Modiolus phaseolinus* in the upper most part of the column was not safed

0		
2	0	Gray clay with articulated <i>Dreisena</i> shells
4		
6		
8		
10		Gray clay visible without shells
12		
14		
16		
18		
20		
22		
24		
26		
28		
30		
32	) (	Gray clay with infrequent <i>Dreisena</i> shells and gas structures
34		
36		
38		
40		
42		
44		
46		
48		
50		
52		
54		
56		
58		
60		
62		
64		
66		
68		
70		
72		
74		
76		
78		
80		
82		
84		
86		
88	) (	
90	* * * *	Dark gray clay with heavy black spots of organic matter
92	* * * *	
94	* * * *	
96	* * * *	
98	* * * *	Gray clay with heavy mottles organic matter
100	* * * *	
102	* * * *	
104	* * * *	
106	* * * *	
108	* * * *	
110	*****	
112		
114	*****	Gray clay with moderate intercalated organic seams
116		
118		
120	*****	
122		
124	*****	Gray clay with heavy intercalated organic seams
126		
128		
130	==*==*==*==*==*==*	Black heavy organic matter
132		
134	*****	
136		
138		Gray clay with heavy organic seams
140	*****	
142		
144	*****	
146		
148	*****	
150		Gray clay with moderate organic seams
152	*****	
154	*****	
156		
158		

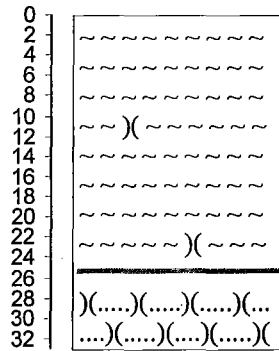
Core AB - 8

08.22.2001

43^o 07,487 N

028° 38,0317 E

Z = 90 m



**Silty sandy clayey, greenish gray mud with Holocen fauna:
Modiolus, Cardium, Mytilus fragments**

Shell hash with greenish gray sandy matrix. Mixture of modern and Neoeuxinian fauna.

33 cm

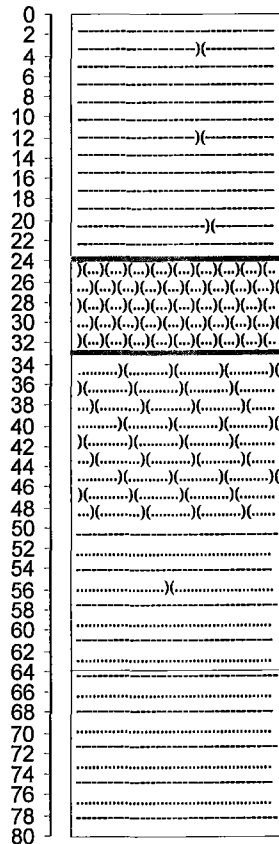
Core AB - 9

08.25.2001

44° 04,3733 N

030° 07,3609 E

Z = 85 m



80 cm

Very soft gray green clay with *Modiolus phaseolinus*
HI³

Soft greenish gray clay with *Modiolus phaseolinus*
HI³

Sharp contact

Shell hash with big fragments of *Mytilus* - HI²

Sharp contact

Sandy shells - lacustrine disarticulated shells and
fragmented
PI (Ne?)

Light sandy gray clay with organic microlamination
and rare fragments of *Dreisena*
PI (Ne?)

Sharp contact

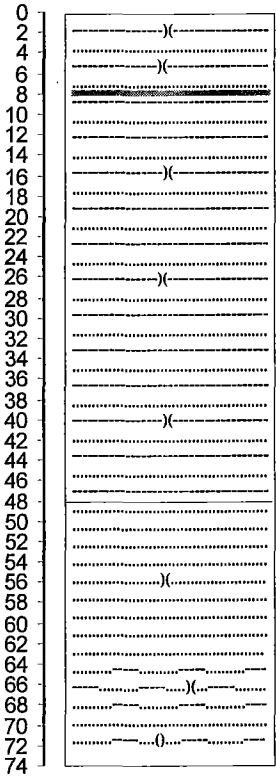
Sandy gray clay with organic microlamination

08.25.2001

44° 02,59 N

30° 12,1206 E

Z = 140 m



Fragments and disarticulated shells of Dreisena and Modiolus concentrated in greenish gray sandy clay (transition part of sediments from lake conditions to marine conditions

Greenish gray soft sandy clay with disarticulated large Dreisena dispersed throughout in the interval
Ne

Sharp contact

Olive gray sand with predomination of shell fragments(mm-s) over disarticulated small Dreisena shells
Ne

Intercalated sand seam in greenish gray clayey sand with disarticulated and articulated Dreisina (>2 cm)
Ne

74 cm

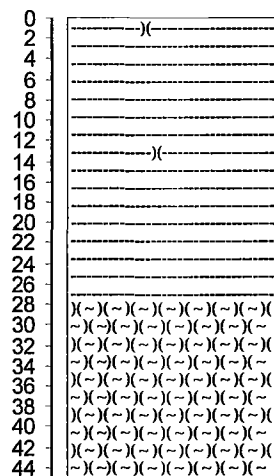
AB-11

08.25.2001

440 02,0320 N

030 11,6894 E

Z = 120 m



Olive gray clay very soft with concentrated *Modiolus phaseolus* (juvenile)
HI³

Gray soft clay with infrequent disarticulated *Modiolus phaseolus*
HI³

Shell hash with large fragments and rare disarticulated shells of *Mytilus*.
Matrix: dark gray clayey mud
HI²²

45 cm

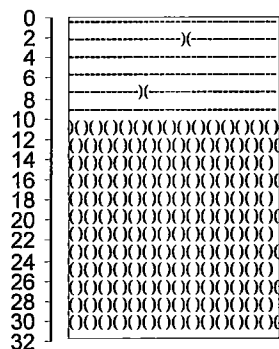
AB-12

08.25.2001

44° 02,830 N

030° 12,580 E

Z = 115 m



Olive gray clay with disarticulated *Modiolus phaseolinus*
HI³

Shell hash with *Mytilus* large fragments
HI²⁷

32 cm

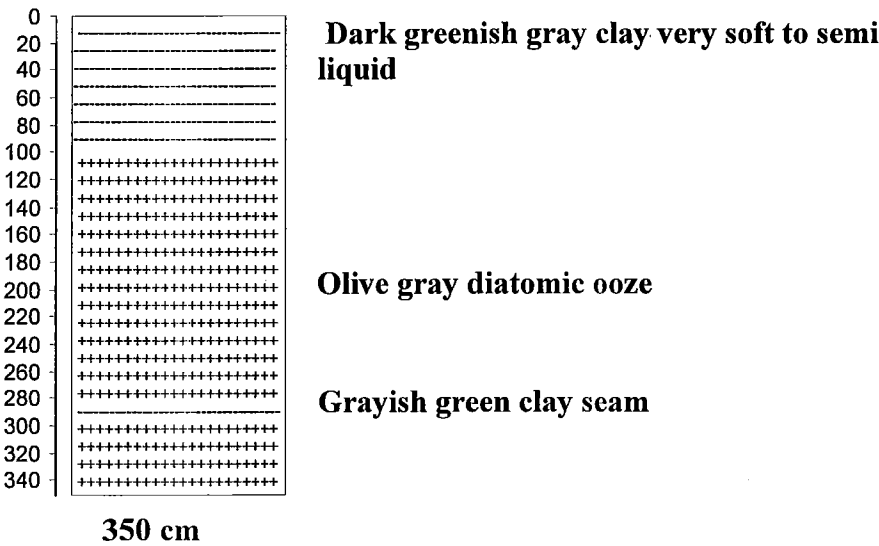
Core - 13

08.25.2001

44° 00,0987 N

30° 16,1837 E

Z = 350 m



Core AB - 14

08.25.2001

43° 53,29 N

30° 26,42 E

Z = 784 m

355 cm - Diatomic ooze with gas structures

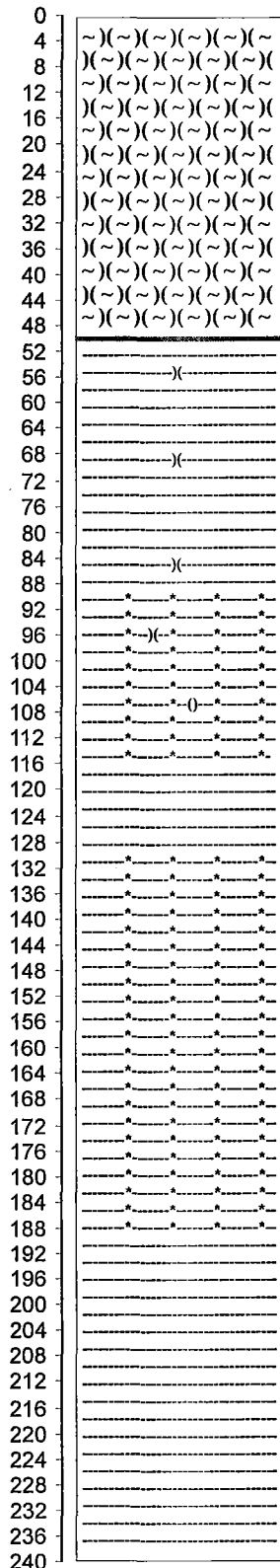
Core AB - 15

08.26.2001

43° 51,5329 N

30° 20,9826 E

Z = 117 m



Mixture Mytilus and Modiolus phaseolinus in mud matrix
Transition part to HI³

Shell hash of Mytilus (3 cm) in mud matrix
HI²

Mixture Mytilus (articulated-3cm and disarticulated shells) and disarticulated
Dreisena shells and fragments in mud matrix. Transition part
Sharp contact

Greenish gray very soft clay with frequent disarticulated Dreisena
shells (1-1.5 cm)
Ne

Gray clay with light organic mottling and articulated and
disarticulated Dreisena shells (1-1.5 cm)
Ne

Gray soft clay without organic matter

Soft gray clay with light organic mottling

Soft gray clay with heavy organic mottling

Soft gray clay with light organic mottling

Middle stiff gray clay, moderate organic mottling

Stiff gray clay

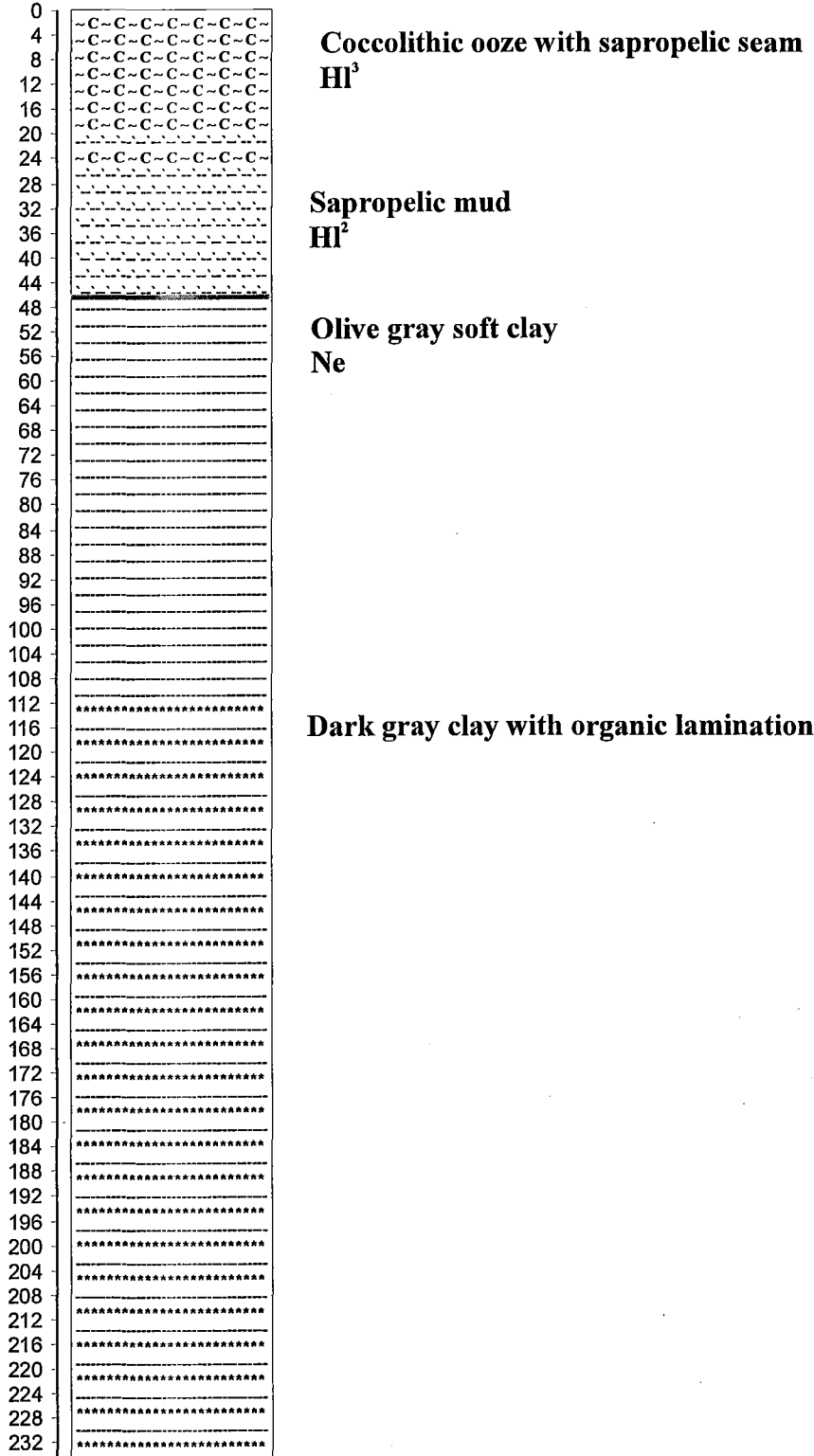
Core AB - 16

08.27.2001

43° 00,870 N

029° 08,67 E

Z = 1629 m



235 cm

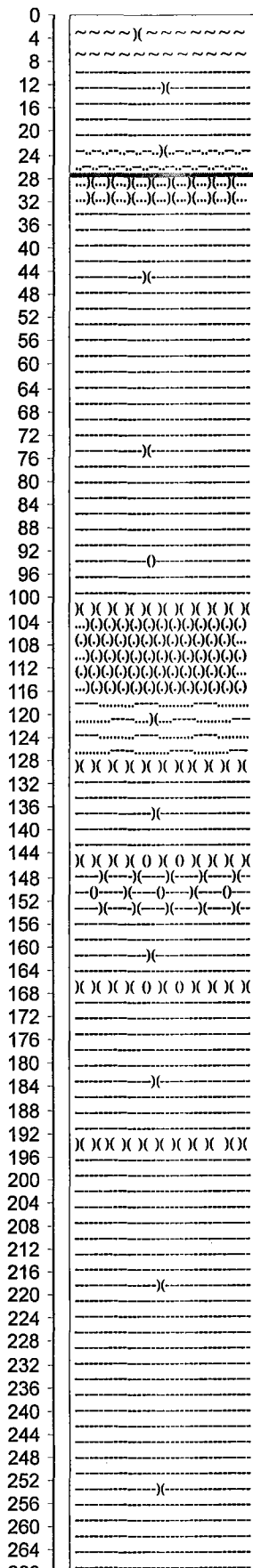
08.27.2001

AB-17

42° 40,3513 N

028° 20,9182 E

Z = 120 m



Mud with juvenile *Modiolus phaseolinus* shells

HI³

Clayey silt to clay in upper part, olive gray
very soft with big fragments of *Mytilus* and
disarticulated *Abra* and *Cardium*

HI²

Seam with very small fragments more than disarticulated
Dreissena shells. Sand matrix, well solid

Ne

Soft greenish gray clay with more fragments than
articulated and disarticulated *Dreissena* shells

Ne

Concentrated disarticulated whole *Dreissena* shells

Concentrated more shell fragments than
disarticulated *Dreissena* shells

Soft gray clayey sand from the shell fragments

Concentrated disarticulated *Dreissena* shells

Moderate stiff clay with *Dreissena* fragments

Large disarticulated and articulated *Dreissena* shells

Concentrated articulated and disarticulated shells of *Dreissena* and
fragments in clay matrix

Moderate stiff gray clay with fragments of *Dreissena*

Seam of concentrated disarticulated and articulated *Dreissena* shells

Moderate stiff gray clay with disarticulated shells, more
fragmented *Dreissena*

Seam of concentrated disarticulated *Dreissena* shells and fragmented

Moderate stiff gray clay with disarticulated and fragmented small
Dreissena shells

Normal grain size gradation

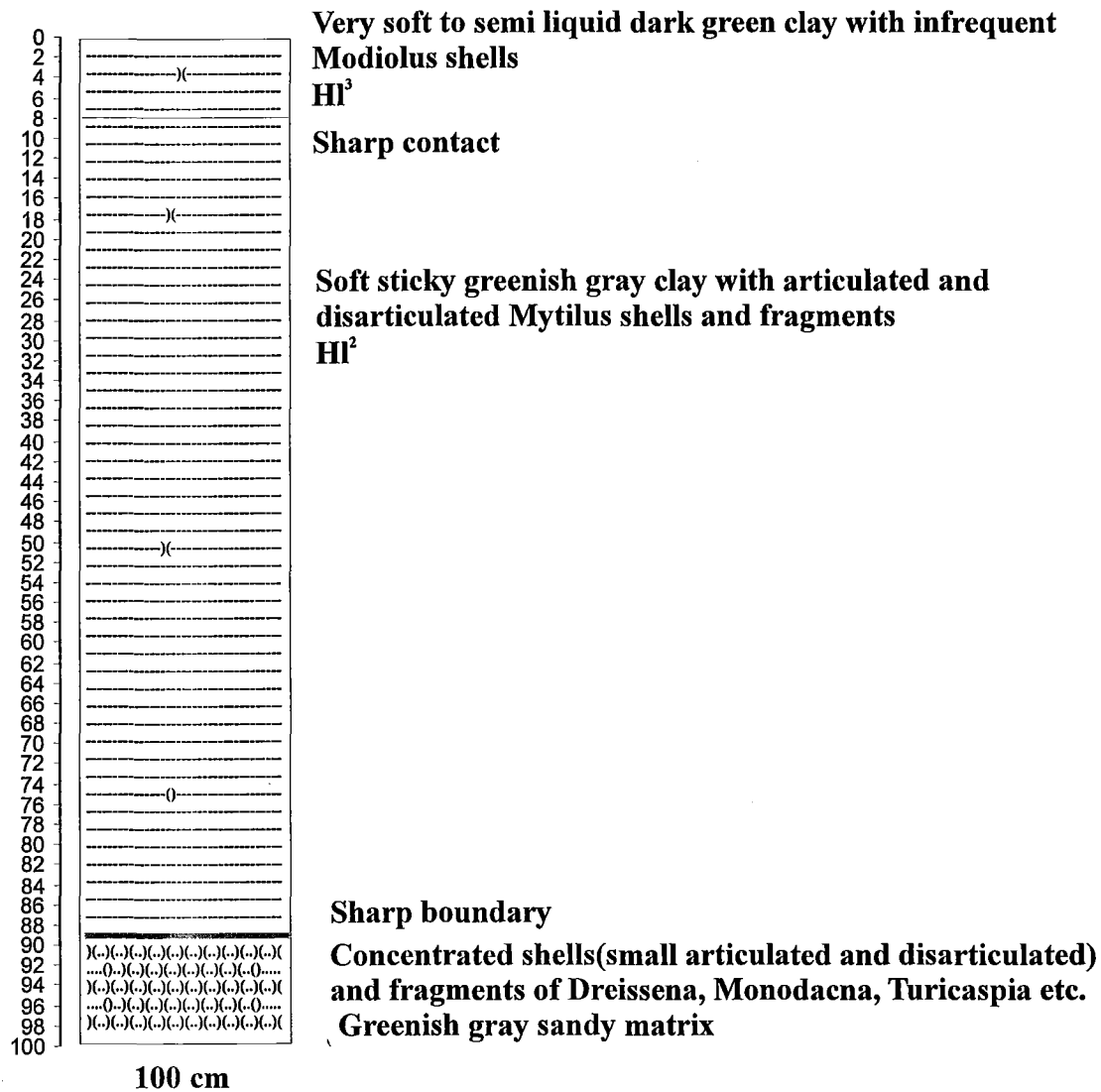
AB-18

08.27.2001

42° 40,3596 N

028° 19,1361 E

Z = 90 m



Summary of Black Sea '01 SIMRAD Data

EXCEL FILE NAME	SIMRAD FILE	START JULIAN DAY	START TIME	START DEPTH	PING INTERVAL	COMMENT
Master1 (Bulg 228-230)	1908	228	19:10:34	4.2	1.359133	
	1939	228	19:40:02	83.2	1.242453	
	2021	228	20:22:49	89.9	1.246392	
	2041	228	20:41:43	84.6	1.241879	
	2123	228	21:23:24	87.6	1.243321	
	2152	228	21:52:44	88.7	1.243243	
	2220	228	22:22:08	92.7	1.244291	
	2250	228	22:52:12	109.9	1.242786	
	2320	228	23:21:48	87.3	1.242542	
	2352	228	23:53:53	116.4	1.243421	
	0021	229	0:22:21	88.2	1.242449	
	0045	229	0:47:22	116.1	1.242236	
	0121	229	1:21:23	89	1.243123	
	0145	229	1:44:56	106.2	1.244382	
	0215	229	2:14:42	92	1.242091	
	0245	229	2:44:57	112.9	1.260741	
	1827	229	18:30:19	143.6	1.241496	Break in time (last file ended at 2:59:08)
	0546	230	5:47:10	122.6	1.241559	
	0713	230	7:13:34	87.2	1.241985	
Master2 (Bulg 230-231)	0840	230	8:40:54	109.2	1.241879	
	1658	230	16:58:50	134.4	1.273359	Break in time (last file ended at 13:41:00)
	1955	230	19:56:03	126.5	1.253898	
	0834	231	8:34:56	151.4	1.242424	
Master3 (Bulg 231-233)	0951	231	9:52:02	144.1	1.486679	
	1035	233	10:35:36	23.8	1.447114	Break in day
Master4 (Bulg 233-4)	1311	233	13:11:38 A	44.6	1.241558	Break in time (last file ended at 12:33)
Master5 (Bulg 234)	0900	234	9:00:00	83.8	1.475501	
Master6 (Romania 235-236)	0802	235	8:02:35	77.5	6.214339	Break in day, after transit to Romania
	1021	235	10:22:01	99.3	6.218097	
	1151	235	11:51:48	86.8	6.213628	
	1248	235	12:48:29	83.4	6.210942	
	1540	235	15:40:16	105.6	6.211391	

	1836	235	18:36:50	108.8	6.211823	
	2125	235	21:25:19	86.7	6.214241	
	0011	236	0:11:38	104.3	6.226698	
	0353	236	3:53:39	109.5	6.210689	
	0854	236	8:54:08	109	6.208931	
	1103	236	11:04:02	94.1	6.221995	
	2112	236	21:12:31	96.4	6.213901	
	0044	237	0:44:21	102.8	6.216921	End time estimated
	0853	237	8:53:10	135.5	6.232911	
	0934	237	9:34:21	89.4	6.227882	last hour or so of data was not on any line....ECHO recovered 1020
Master7 (Romania--Recovered from ISIS data)	1	237	20:33:24	551.5	7.133256083	break in time. See file "Full data processed from recovery.xls"; it includes comparisons with known periodic SIMRAD depths which were logged in NAV book. Some anomalous or incomplete lines have been deleted.
	2	237	23:24:42	111.3	7.133256083	Note:these filenames are not SIMRAD files and don't really exist. They are invisible.
	3	237	23:58:36	116.3	6.416666667	Method: From ISIS data (layback, Fish depth, altitude, speed), bottom depth was calculated and time difference between fish and boat location was determined.
	4	238	1:09:17	202.5	7.543209877	
	5	238	1:24:34	275.2	6.697332107	
	6	238	3:24:54	110.5	6.504217432	
	7	238	5:24:20	254.1	6.785305344	
	8	238	7:21:10	110.7	6.611428571	
	9	238	9:15:37	283.1	6.620853081	
	10	238	11:11:32	110.9	6.658823529	
	11	238	12:49:06	180.1	6.150442478	
	12	238	13:07:58	244.2	6.879382889	
	13	238	14:23:37	118.7	6.416879795	
	14	238	15:09:18	110.9	6.489871087	
	15	238	17:10:32	224.6	6.946264744	
	16	238	18:57:04	124.8	4.05982906	
Master8 (Area V 239-241)	1335	239	13:35:25	88.8	7.460260973	break in day

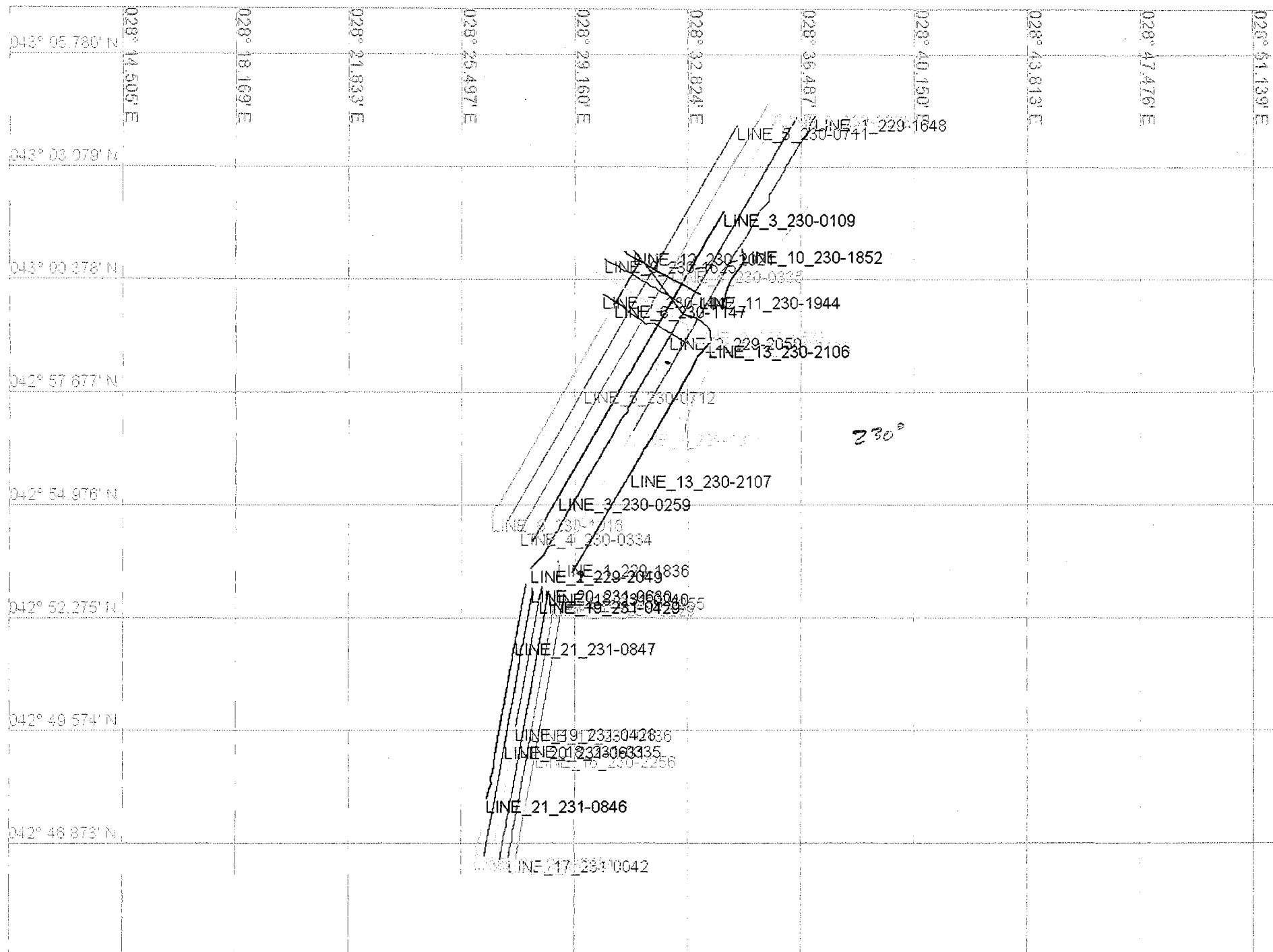
	1849	239	18:50:05	96.3	7.454076367	
	2050	239	20:50:37	117.9	7.464944649	
	2124	239	21:24:42	100.9	7.450499839	
	0349					highly incomplete file, omitted
	0745	240	7:46:03	127.1	7.458769634	break in time (last ended 3:49:46)
	1056	240	10:56:08	151.7	7.429139731	
	1506	240	15:06:40	135.5	7.450395901	
	1933	240	19:33:33	149	7.676056338	
	2055	240	20:55:46	160.9	7.457383	break in time (last ended 19:42:38)
	0023	241	0:23:22	164	7.545665	

Summary of Black Sea '01 SIMRAD Data

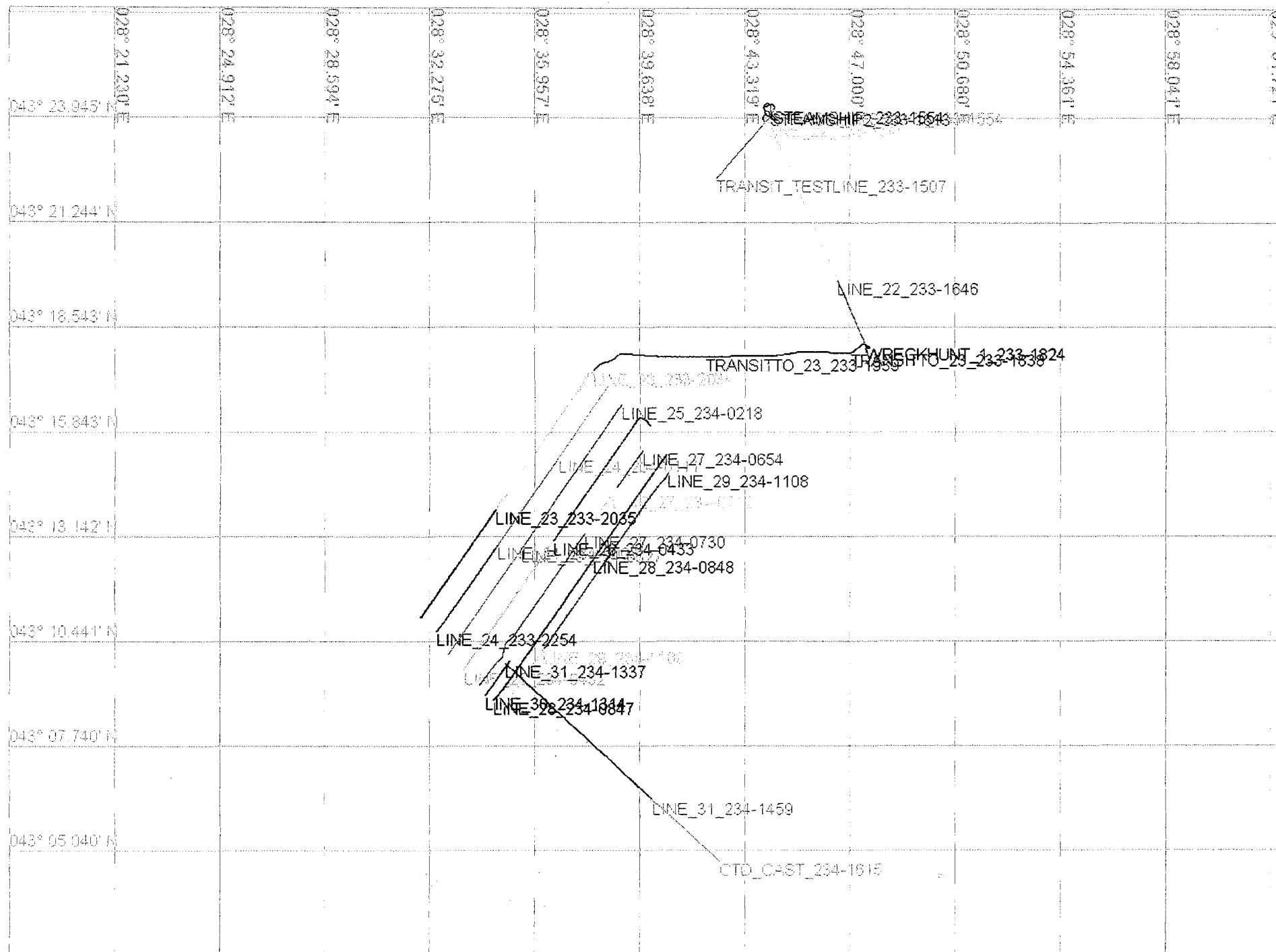
EXCEL FILE NAME	START		START TIME	START DEPTH	PING INTERVAL	COMMENT
	SIMRAD	JULIAN				
Master1 (Bulg 228-230)	1908	228	19:10:34	4.2	1.359133	
	1939	228	19:40:02	83.2	1.242453	
	2021	228	20:22:49	89.9	1.246392	
	2041	228	20:41:43	84.6	1.241879	
	2123	228	21:23:24	87.6	1.243321	
	2152	228	21:52:44	88.7	1.243243	
	2220	228	22:22:08	92.7	1.244291	
	2250	228	22:52:12	109.9	1.242786	
	2320	228	23:21:48	87.3	1.242542	
	2352	228	23:53:53	116.4	1.243421	
	0021	229	0:22:21	88.2	1.242449	
	0045	229	0:47:22	116.1	1.242236	
	0121	229	1:21:23	89	1.243123	
	0145	229	1:44:56	106.2	1.244382	
	0215	229	2:14:42	92	1.242091	
	0245	229	2:44:57	112.9	1.260741	
	1827	229	18:30:19	143.6	1.241496	Break in time (last file ended at 2:59:08)
	0546	230	5:47:10	122.6	1.241559	
	0713	230	7:13:34	87.2	1.241985	
	0840	230	8:40:54	109.2	1.241879	
Master2 (Bulg 230-231)	1658	230	16:58:50	134.4	1.273359	Break in time (last file ended at 13:41:00)
	1955	230	19:56:03	126.5	1.253898	
	0834	231	8:34:56	151.4	1.242424	
	0951	231	9:52:02	144.1	1.486679	
Master3 (Bulg 231-233)	1035	233	10:35:36	23.8	1.447114	Break in day
	1311	233	13:11:38 A	44.6	1.241558	Break in time (last file ended at 12:33)
Master4 (Bulg 233-4)	0900	234	9:00:00	83.8	1.475501	
Master5 (Bulg 234)						
Master6 (Romania 235-236)	0802	235	8:02:35	77.5	6.214339	Break in day, after transit to Romania
	1021	235	10:22:01	99.3	6.218097	
	1151	235	11:51:48	86.8	6.213628	
	1248	235	12:48:29	83.4	6.210942	
	1540	235	15:40:16	105.6	6.211391	
	1836	235	18:36:50	108.8	6.211823	
	2125	235	21:25:19	86.7	6.214241	
	0011	236	0:11:38	104.3	6.226698	
	0353	236	3:53:39	109.5	6.210689	

42° 20' - 42° 30'
28° 19.2' -

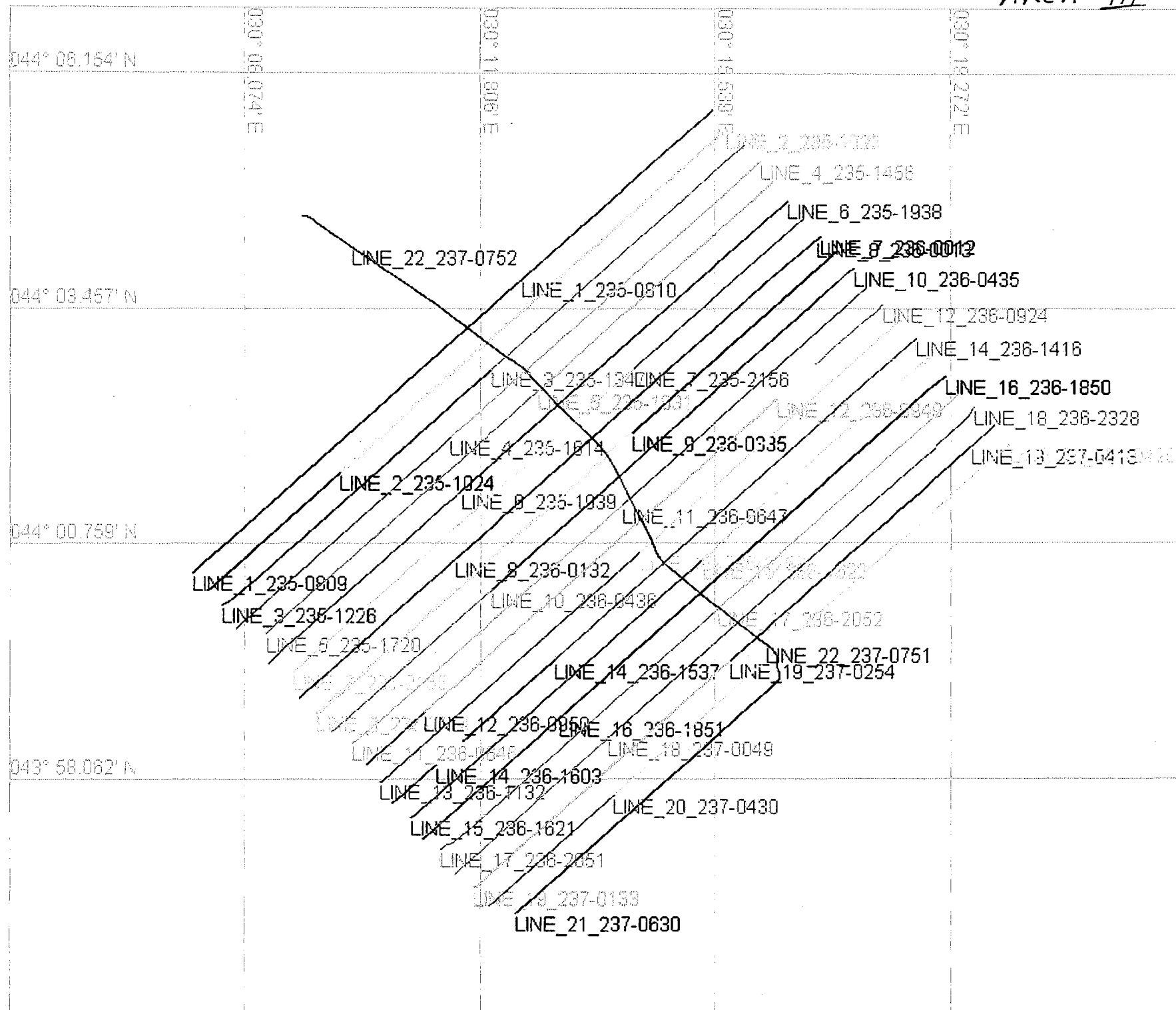
AREA I



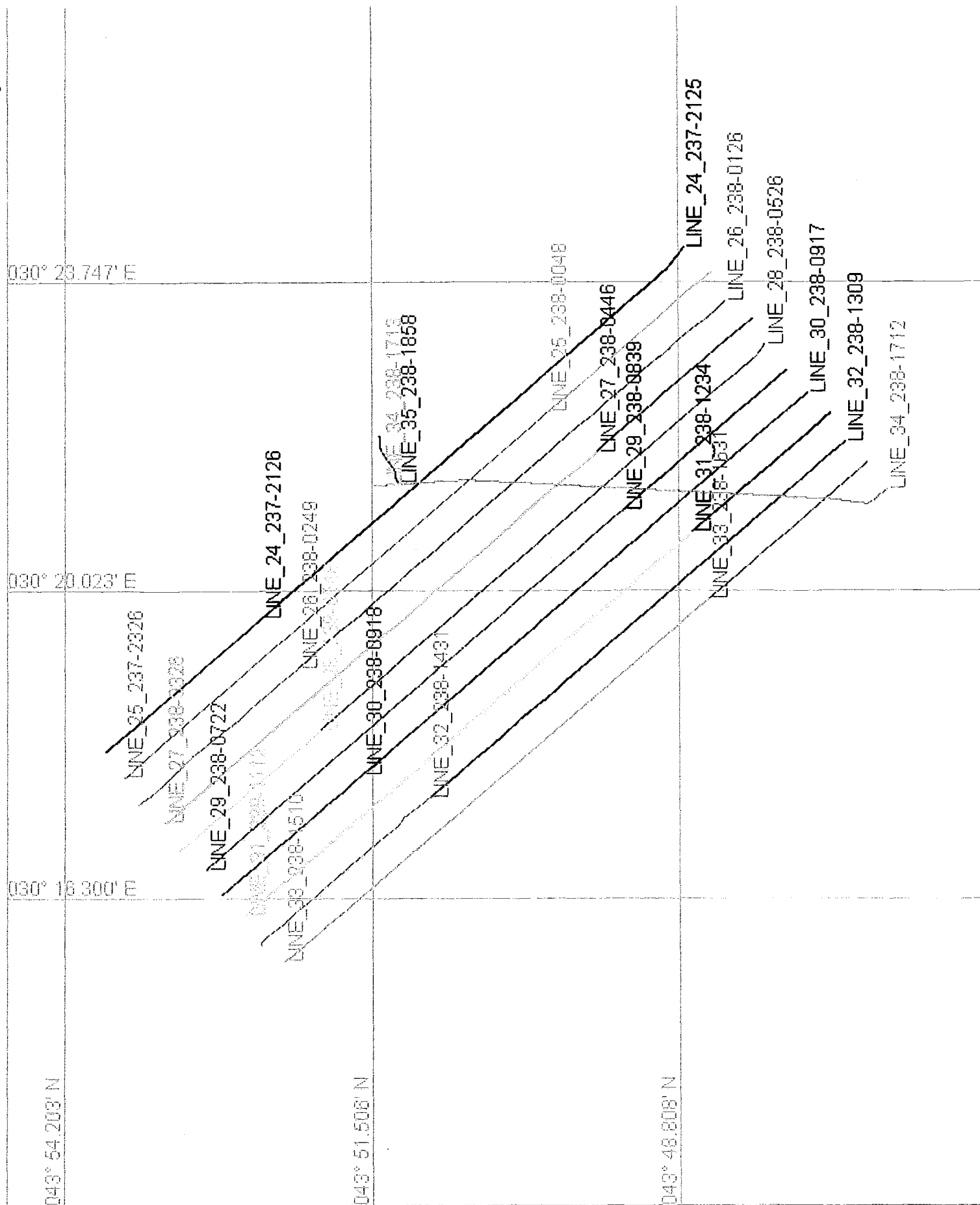
AREA II



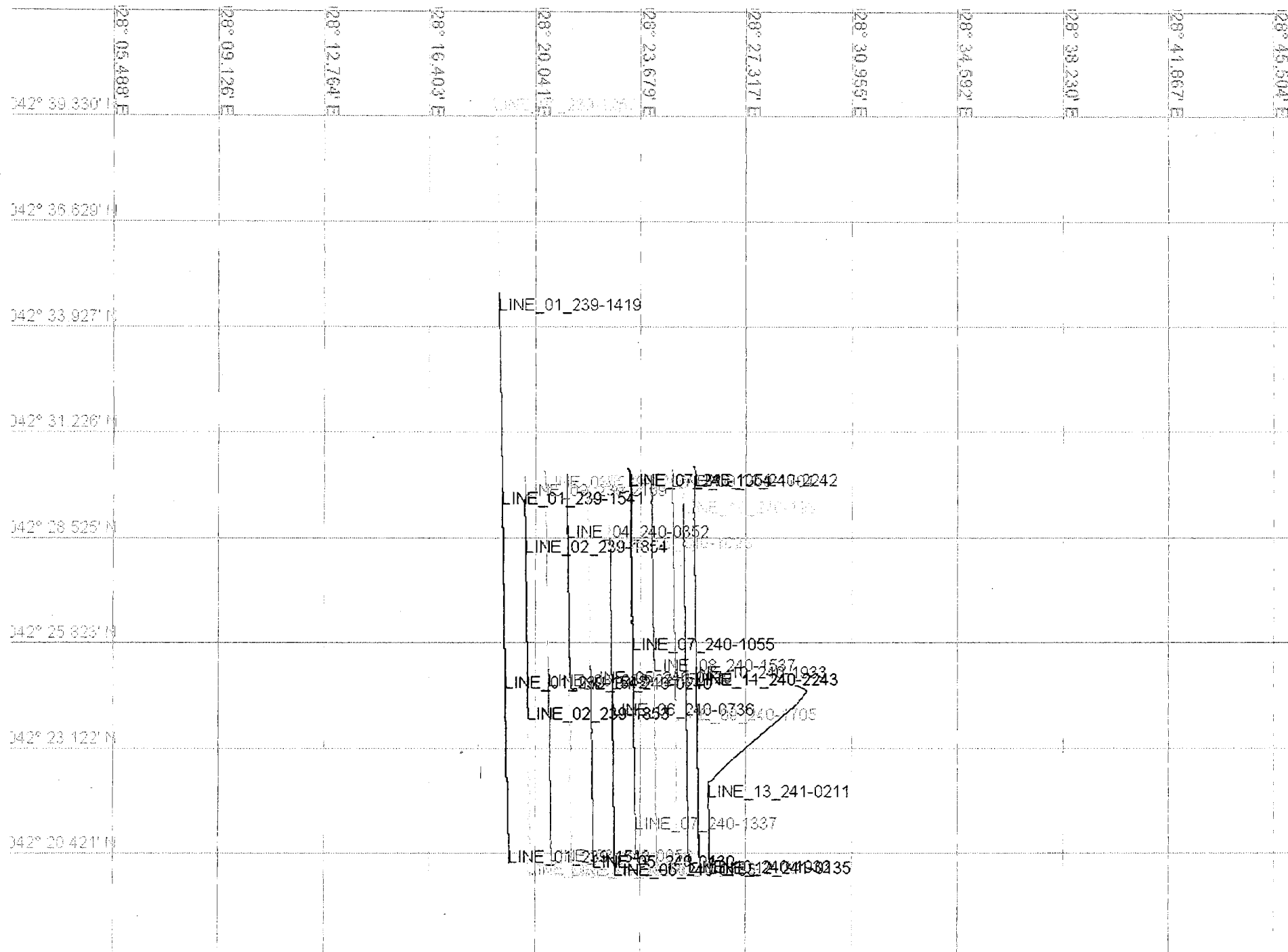
AREA III



AREA IV



AREA V



I

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ TEI/ISSONAR/ Transit_2	12:45 _{gm}	13:36	transit to line 1 1	200	
✓ TEI/ISSONAR/ 229-1336	13:36	14:57	transit to line 1	200	target 1
✓ TRANSIT-2-229- 1457.XTF	14:57	16:18	transit to line 1	200	targets 2,3,4
✓ TRANSIT-2-229- 1618.XTF	16:18	16:48	transit to line 1	74	
✓ LINE1-229-1648 XTP	16:48	18:35	Beginning Line 1	200	targets 5-8
✓ LINE1-229- 1835.XTF	18:35	19:19	End Line 1	77	targets 9
✓ TURN1-229- 1919.XTF	19:19	20:49	Turn 1	1.75	
✓ LINE2-229- 2049.XTF	20:49	22:41	begin line 2	200	targets 10-12
✓ LINE2-229- 2050.XTF	22:41	00:20	End line 2	182	* Note discrepancy in filename targets 13-18
✓ TURN2-230- 0020.XTF	00:20	00:28	Turn 2	15	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ LINE3-230-0028.XTF	00:28	00:57	Start 3	?	Ended w/ Computer freeze
✓ Line 3-230-0109.XTF	01:09	02:59 03:01	Line 3	200	targets 19, 20
✓ Line 3-230-0259.XTF	02:59	03:16	Line 3	30	
✓ TURN 3-230-0316.XTF	03:16	03:34	Turn 3	32	
✓ Line 4-230-0334.XTF	03:34	05:26	Start 4	200	targets 21, 22
✓ LINE 4-230-0338.XTF	05:26	06:47	line 4		* note discrepancy in file name targets 23-27
✓ TURN 4-230-0647.XTF	06:47	06:52	Turn 4		targets 23-27 logging out to network computer
✓ TURN 4-230-0657.XTF	06:57	07:11	TURN 4		
✓ LINE 5-230-0711.XTF	07:11	09:07	Start line 5	200	targets 28, 29
✓ LINE 5-230-0712.XTF	09:07	10:04	End Line 5	112	* note discrepancy in file name

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ TURN5-230-1004.XTF	1004	1016	Turn 5	21	
✓ LINE6-230-1016.XTF	1016	1147	Start Line 6	199	
✓ LINE6-230-1147.XTF	1147	1216	Line 6	104	
✓ TURN6-230-1216.XTF	1216	12:58	Turn 6	155	
✓ TURN6-230-1422.XTF	14:22	14:42	Turn 6	75	
✓ TURN 7-230-1442.XTF Line	14:42	15:21	Start 7	146	
TURN7-230-1521.XTF	15:21	15:33	Turn 7	42	target 30
✓ LINE8-230-1533.XTF	15:33	16:10	Start 8	137	
✓ TURN8-230-1610.XTF	16:10	16:25	Turn 8	59	
✓ LINE9-230-1625.XTF	16:25	17:01	Start 9		

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ TURN 9B - 230-1734.XTF	17:34	17:50?	None!	166 Kb	turn 9 after coring to get back on line 9
✓ TURN 9B - 230-1801.XTF	18:01	18:09	None!	? complete crash	parallel to contours while fixing which w/ ECRD down } target 31
✓ TURN 9B - 230 -1820.XTF	18:20	18:52	None!	120MB	In transit to Line 10
✓ LINE 10 - 230 -1852.XTF	18:52	19:14	Begin Line 10	8 MB	target 32
✓ TURN 10 - 230 -1914.XTF	19:14	19:44	turn 10	113MB	
✓ LINE 11 - 230 -1944.XTF	19:44	20:15	start LINE 11	115MB	
✓ TURN 11 - 230 -2015.XTF	20:15	20:21	turn 11	20MB	
✓ LINE 12 - 230 -2021.XTF	20:21	21:05	begin line 12	164MB	target 33
✓ LINE 12 - 230 -2105.XTF	21:05	21:05 22:01	line line 13	200	targets 34-37
✓ LINE 13 - 230 -2107.XTF	21:05 22:01	22:45	line 13	162	target 38

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

	File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓	TURN13-230- 2245.XTF	22:45	22:54	turn 13	33	
X	LINE16-230- 2254.XTF	22:54	23:50	start line 16	—	* File is non-existent or missing
✓	LINE16-230- 2255.XTF	23:50		Line 16	200 230	was once 20346 (when 2254 existed). Now it is 200mb & 2254 is gone
✓	LINE16-230- 2256.XTF		00:28	Line 16	138	
✓	TURN16-231 0028.XTF	00:28	00:42	turn 16	50	
✓	LINE17-231- 0042.XTF	00:42	01:36	start line 17	196	
✓	Line17-231-0136.XTF	01:36	02:29	Line 17	195	
✓	Line17-231-0229.XTF	02:29	02:36	Line 17	22	
✓	TURN17-231-0236.XTF	02:36	02:40	Turn 17		
✓	Line18-231-0240.XTF	02:40	03:35	start 18		

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
Line 18-231-0335.XTF Line 18-231-0335.XTF ✓ Line 18-231-0335.XTF	03:35	04:14	Line 18	159	
✓ Turn 18-231-0419.XTF	04:19	04:27	Turn 18	29	
✓ Line 19-231-0427.XTF	04:27	?	Start 19	200	target 43
✓ LINE 19-231-0428.XTF	?	06:24	line 19	200	target 44
✓ LINE 20-231-0623.XTF TURN 19-231-0623.XTF	06:28	06:30	begin line 19 29 turn 19	200 29	
✓ LINE 20-231-0630.XTF	06:30	06:30 07:26	begin line 20	200	
✓ LINE 20-231-0631.XTF	07:26 07:26	08:05	line 20	200 144	* discrepancy in time
✓ TURN 20-231-0805.XTF	08:05	08:21	turn 20	58.5	
✓ LINE 21-231-0821.XTF	08:21	08:46	line 21	84	
✓ LINE 21-231-0846.XTF	08:46		line 21		new file after program freeze

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
LINE 21-231- 0847.XTF		10:09	Line 21	101	
TORN 21-231- 1009	10:09	10:17	Torn 21	30	
Transit - testline - 233 - 1507.XTF	15:07	15:54	Transit 150		target 45 - Steamship
Transit - testline - 15:54			1.5		
Steamship - 233 - 1554.XTF	15:54	16:13	Transit Transit	76	
Steamship 2 - 233 - 1613.XTF	16:13	16:45	Transit	120	
LINE 22-233- 1645.XTF	16:45	17:53	line 22 start	204	targets 46 & 47
LINE 22-233- 1646.XTF	17:53	18:24	line 22	90	target 48
WRECKHUNT 1-233- 1824.XTF	18:24	18:38	checking for known shipwreck	31	
TRANSIT TO TRANSIT TO-23- 233-1838.XTF	18:38	19:39	transit to line 23	180	
TRANSIT TO-23- 233-1939.XTF	19:39	20:34	transit to line 23	165	

II

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ LINE 23-233- 2034.XTF	20:34	21:45	line 23	200	
✓ LINE 23-233- 2035.XTF	21:45	22:38	line 23	158	
✓ TURN 23-233- 2238.XTF	22:38	22:55	turn 23	47	
✓ LINE 24-233- 2254.XTF	22:55	00:03	line 24	204	
✓ LINE 24-234- 0005.XTF renamed Line 24-234-0005.XTF	00:03	01:11	line 24	156	Target 49
✓ LINE 24-234-0111.XTF	01:11	02:05	line 24	160	
✓ TURN 24-234-0205	02:05	02:18	turn 24	38	
✓ LINE 25-234-0218.XTF	02:18	03:27	shoot 25	200	
✓ LINE 25-234-0327	03:27	04:16	line 25	143	Target 50
✓ TURN 25-234-0416	04:16	04:32	turn 25	45	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
Line 26-234-04:32	04:32	05:41	Line 26	204	
LINE 26-234-04:33.XTF	05:41	06:44	line 26	189	includes some of turn 26 (file switched over late)
TURN 26-234-06:44.XTF	06:44	06:54	turn 26	30	
LINE 27-234-06:54.XTF	06:54	07:12	begin line 27	47	
LINE 27-234-07:12.XTF	07:12	07:30	line 27	44	
LINE 27-234-07:30.XTF	07:30	08:34	line 27	191	
TURN 27-234-08:34.XTF	08:34	08:47	turn 27	37	
LINE 28-234-08:47.XTF	08:47	10:06	line 28	200	
LINE 28-234-08:48.XTF	10:06	10:58	line 28	130	Target 51
TURN 28-234-10:58.XTF	10:58	11:02	turn 28	7	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ LINE 29-234 1108.XTF	11:08	12:32	LINE 29	200	Target 52, 53
✓ LINE 29-234 1109.XTF	12:32	12:58	LINE 29	66	
✓ TURN 29-234-1258.XTF	12:58	13:14	turn 29	37	
✓ LINE 30-234-1314.XTF	13:14	13:31	start 30	42	
✓ TURN 30-234-1331.XTF	13:31	13:37	turn 30	14	
✓ LINE 31-234-1337.XTF	13:37	14:59	start 31	198	Target 54
✓ LINE 31-234-1459.XTF	14:59	15:11	LINE 31	70	stopped to Recompute computer
✓ CTD-CAST-234- 1615.XTF	16:15	17:04	CTDcast ~ line 31	72	
✓ TRANSIT-LINE- 235-0715.XTF	07:15	07:17	transit to line 32	4	stopped to get depth reading
✓ TRANSIT-LINE- 235-0718.XTF	07:18	08:09	transit to line 32	121	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ LINE 1-235-0809.XTF	08:09	09:30	Line 1	200	New survey area - Romanin TARGET 1
✓ LINE 1-235-0810.XTF	09:30	10:16	Line 1	109	TARGET 2. Sub-bottom was tracking surface reflection in beginning.
✓ TURN 1-235-1016.XTF	10:16	10:23	Turn 1	17	TARGETS 3-5
✓ LINE 2-235-1023.XTF	10:23	11:45	Line 2	200	TARGETS 3-5
✓ LINE 2-235-1024.XTF	11:45	12:16	Line 2	73	
✓ TURN 2-235-1216.XTF	12:16	12:26	Turn 2	25	
✓ LINE 3-235-1226.XTF	12:26	13:47	Line 3	196	
✓ LINE 3-235-1347.XTF	13:47	14:49	Line 3	150	Target 8
✓ TURN 3-235-1449.XTF	14:49	14:56	Turn 3	15	
✓ LINE 4-235-1456.XTF	14:56	16:14	Line 4	190	Target 9, 10

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ Line 4-235-1614.XTF	16:14	17:11	4	139	target 11
✓ TURN 4-235-1711.XTF	17:11	17:11	turn 4	1	stopped to reset isis - clean up slant range
✓ LINE 5-235-1720.XTF LINE 5-235-1720.XTF	17:20	18:31	start line 5	174	target 12
✓ LINE 5-235-1831.XTF	18:31	19:29	line 5	145	
✓ TURN 5-235-1929.XTF	19:29	19:38	turn 5	20	
✓ LINE 6-235-1938.XTF	19:38	21:00	begin line 6	200	
✓ LINE 6-235-1939.XTF	21:00	21:48	LINE 6	117	
✓ TURN 6-235-2148.XTF	21:48	21:55	TURN 6	17.2	
✓ LINE 7-235-2155.XTF	21:55	23:19	LINE 6	200	targets 14,16
✓ LINE 7-235-2156.XTF	23:19	00:04	LINE 6	110	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ TURN 7-236-0004.XTF	00:04	00:13	TURN 7	18	
✓ LINE 8-236-0013.XTF	00:13	01:32	LINE 8	192	
✓ LINE 8-236-0132.XTF	01:32	02:05	LINE 8		Page 17
✓ TURN 8-236-0205.XTF	02:05	02:14	TURN 8	195	
✓ LINE 9-236-0214.XTF	02:14	03:35	LINE 9		
✓ LINE 9-236-0335.XTF	03:35	04:28 04:28	LINE 9	128	
✓ TURN 9-236-0428.XTF	04:28	04:35	TURN 9	204	
✓ LINE 10-236-0435.XTF	04:35	05:57	LINE 10	204	
✓ LINE 10-236-0557.XTF	05:57	06:34	LINE 10		*Note discrepancy in time stamp Targets 18 & 19
✓ TURN 10-236-0634.XTF	06:34	06:46	TURN 10		

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ LINE-10-236-0846.XTF	06:46	08:08	start line 10	204	
✓ LINE-11-236-0847.XTF	08:08	09:16	line 11	165	
✓ TURN 11-236-0916.XTF	09:16	09:24	TURN 11	18	
✓ LINE 12-236-0924.XTF	09:24	09:42	LINE 12		System freeze
✓ LINE 12-236-0949.XTF	09:49	11:15	LINE 12	200	
✓ LINE 12-236-0950.XTF	11:15	11:25	LINE 12	37	
✓ TURN 12-236-1125.XTF	11:25	11:32	TURN 12	18	
✓ LINE 13-236-1132.XTF	11:32	12:53	LINE 13	196	
✓ LINE 13-236-1253.XTF	12:53	14:09	LINE 13	183	Targets 21, 22
✓ TURN 13-236-1409.XTF	14:09	14:16	TURN 13	16	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ Line 14-236-1416.XTF	14:16	15:37	start 14	197	
✓ Line 14-236-1537.XTF	15:37	16:03	14	49	
✓ Line 14-236-1603.XTF	16:03	16:13	14	63	
✓ TURN 14-236-1613.XTF	16:13	16:21	turn 14	20	
✓ Line 15-236-1621.XTF	16:21	17:44	Start 15	204	Target 24
✓ LINE 15-236-1822.XTF	17:44	18:44	line 15	146	target 25
✓ TURN-15-236-1844.XTF	18:44	18:50	turn 15	1	
✓ LINE-16-236-1850.XTF	18:50	20:12	start line 16	204	
✓ LINE-16-236-1851.XTF	20:12	20:41	line 16	71	
✓ TURN-16-236-2041.XTF	20:41	20:51	turn 16	25	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ line.17-236-2051. XTF	2051	22:15	LINE 17	200	
✓ LINE17-236- 2051 .XTF 2052	22:15	23:20	LINE 17	159	
✓ turn. 17-236- 2320.XTF	2320	23:28	TURN 17	20	
✓ LINE 18-236 2328.XTF	23:28	00:49	LINE 18	196	TARGET 28
✓ Line 18-237-0049.XTF	00:49	01:23	Line 18	83	Target 29
✓ TURN 18-237-0123.XTF	01:23	01:33	TURN 18	22	
✓ Line 19-237-0133.XTF	01:33	02:54	Shunt 19	196	
✓ Line 19-237-0254.XTF	02:54	04:13	Line 19	192	Target 30
✓ Line 19-237- 0413.XTF	0413	0422	Line 19	18	
✓ Turn. 19-237- 0420.XTF	0422	0429	Turn 19	18	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ Line-20-237- 0429.XTF	0429	05:52	Start Line 20	204	
✓ TURN-20-237 0551 LINE-20-237- 0430.XTF	05:52	06:17	20	64	
✓ TURN-20-237- 0617.XTF	06:17	06:30	turn 20	32	
✓ LINE-21-237 0630.XTF	06:30	07:51	start line 21	200	
✓ LINE-22-237 - 0751.XTF	07:51		start line 22		axis of canyon
✓ LINE-23-237 2216 XTF	20:16	21:25	start line 23	100	TRANSIT Target 31
✓ LINE 24-237 2125.XTF	21:25	22:50	LINE 24	200	ISIS line 24 = HYPACK line 21 TARGET #32
✓ LINE 24-237- 2126.XTF	22:50	23:19	LINE 24	74	
✓ TURN 24-237- 2319.XTF	23:19	23:26	TURN 24	14	
✓ LINE 25-237- 2326.XTF	23:26	00:48	LINE 25		

IV

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ Line 25-238-0048.XTF	00:48	01:19	25	76	targets 33-35
✓ Turn 25-238-0119.XTF	01:19	01:26	turn 25	17	
✓ Line 26-238-0126.XTF	01:26	02:49	start 26	200	targets 36 & 37
Line 26-238-0127.XTF					
✓ Line 26-238-0249.XTF	02:49	03:19	26	74	
✓ Turn 26-238-0319.XTF	03:19	03:26	turn 26	15	
✓ Line 27-238-0326.XTF	03:26	04:46	start 27	195	
✓ Line 27-238-0446.XTF	04:46	05:16	line 27	71	
✓ Turn 27-238-0516.XTF	05:16	05:26	turn 27	23	
✓ Line 28-238-0526.XTF	05:26	06:48	line 28	200	targets 38 & 39
✓ Line 28-238-0648.XTF	06:48	07:14	line 28	173 63	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ TURN-28-238- 0714.XTF	07:14	07:22	turn 28	20	
✓ LINE-29-238- 0722.XTF	07:22	08:39	start 29	186	
✓ LINE 29-238- 0839.XTF	08:39	09:10	29	75	
✓ TURN-29-238- 0910.XTF	09:10	09:17	TURN 29	17	
✓ LINE 30-238 0917.XTF	09:17	10:40	LINE 30	200	Targets 40-42
✓ LINE 30-238 0918.XTF	10:40	11:06	LINE 30	63	Target 43
✓ TURN 30-238 1106.XTF	11:06	11:12	TURN 30	16	
✓ LINE 31-238 1112.XTF	11:12	12:34	LINE 31	199	Target 44
✓ LINE 31-238 1234.XTF	12:34	1302	LINE 31	66	
✓ Turn-31-238- 1302.XTF	1302	1309	Turn 31	18	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

	File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓	Line-32-238-1309.XTF	1309	1431	Line 32	198	Target 46
✓	Line-32-238-1431.XTF	1431	1505	Line 32	80	
✓	Turn-32-238-1505.XTF	1505	1510	Turn 32	13	
✓	Line-33-238-1510.XTF	1510.59	16:30	Line 33	196	
✓	Line-33-238-1631	16:30	17:02	33	76	
✓	TURN-33-238-1702.XTF	17:02	17:12	Turn 33	22	TARGET 49
✓	LINE-34-238-1712.XTF	17:12	18:29	Start line 34	204	TARGET 48
✓	LINE-34-238-1713.XTF	18:29	18:31	34	6	
✓	TURN-34-238-1831.XTF	18:31	18:58	turn 34	67	PASSING OVER TARGET 32 FROM LINE 34 AGAIN
✓	LINE-35-238-1858.XTF	18:58	1910	Start line 35	70 29	

V

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ Line01-239-1257.XTF	12:57	14:19	area ✓ 2	198	
✓ Line01-239-1419.XTF	14:19	15:41	239 1	199	
✓ Line01-239-1541.XTF	15:41	17:04	2	204	✓ Line-01-1542.XTF 1826, 2004
✓ LINE-01- 1834 239-1543.XTF	18:28	18:34	1	19	
✓ TURN-01-239 -1834.XTF	18:34	18:52	turn 1	45	
✓ LINE02-239- 1852.XTF	18:52	20:15	start line 2	204	target 50
✓ LINE-02-239- 1853.XTF	20:15	21:44	2	200	target 51
✓ LINE02-239 1854.XTF	21:44	~21:56	2	39	target 52 System crash
✓ LINE02-239 2159.XTF	21:59	22:02	2	8	
✓ TURN02-239- 2202.XTF	22:02	22:12	TURN 2	23	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ LINE03-239- 2212.XTF	22:12	23:35	LINE 3	200	TARGET 53
✓ LINE03-239- 2213.XTF	23:35	00:56	3	196	
✓ LINE03-240-0056.XTF	00:56	01:03	3	18	
✓ 102103-240-0103.XTF	01:03	01:17	turn 3	34	
✓ Line4-240-0117.XTF	01:17	02:40	start 4	199	
✓ Line4-240-0240.XTF	02:40	03:52	4	175	
✓ Line4-240-03:52.XTF	03:52	04:18	4	62	
✓ Run4-240-0418.XTF	04:18	04:28	turn 4	24	
✓ Line5-240-0428.XTF	04:28	05:51	Shut 5	204	target 54
✓ LINE-05-240- 0429.XTF	05:51	07:13	5	97 200	targets 55,56
Line-05-240- 430.XTF	07:13	07:17	5	9MB	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ TURN-05-240 -0717.XTF	07:17	07:35	Turn 5	42	
✓ LINE 06-240- 0735.XTF	07:35	8:58	Start line 6	200	
✓ LINE06-240- 0736.XTF	8:58	10:20	6	199	
✓ LINE06-240- 1020.XTF	10:20	10:45	6	62	
✓ TURN06-240- 1045.XTF	10:45	10:54	TURN 6	20	
✓ LINE07-240- 1054.XTF	10:54	12:17	START 7	200	
✓ LINE07-240- 1055.XTF	12:17	13:37	7	195	
✓ Line7-240-1337.XTF	13:37	14:00	7	57 58	
✓ Turn7-240-1400.XTF	14:00	14:16	TURN 7	38	
✓ Line8-240-1416.XTF	14:16	15:37	Start 8	195	

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

File Name	Start Time	End Time	Line	Total (Mb)	Comments
✓ LINE 08-240-1654.XTF	15:37	16:54	8	190	target 58
✓ TURN_08-240-1654.XTF	16:54	17:04	turn 8	23.61	
✓ LINE_09-240-1704.XTF	17:04	18:26	start line 9	204	target 59
✓ LINE_09-240-1705.XTF	18:26	19:23	9	141	
✓ TURN_09-240-1923.XTF	19:23	19:32	turn 9	22	
✓ LINE_10-240-1932.XTF	19:32	20:55	start line 10	200	
✓ LINE 10-240-1933.XTF	20:55	22:15	10	200	
✓ LINE 10-240-1934.XTF	22:15	22:35	10	44	
✓ TURN 10-240-2235.XTF	22:35	22:42	TURN 10	15	
✓ LINE 11-240-2242.XTF	22:42	00:04	START LINE 11	200	Target #60

IFE - BLACK SEA 2001 - XTF RAW DATA FILE LOG

[illegible]

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

- Port/Starboard
- Range

Target ID	Time	Location	File	Ping	Description
1	2:50 pm	43° 5' 7.2" N 28° 27' 56.75" E	TEI/ISSONAR/ 229-1336.XTF	10675	Geotarget in Subbottom Saved as 4-Channel 1
2	15:46	43.072° N 28.545° E	TRANSIT-2-229- 1457.XTF	6804	Geotarget in Subbottom Saved as - Potential Fault 4-Channel 2
3	15:48	43.072° N 28.548° E	TRANSIT-2-229- 1457.XTF	7058	Geotarget in Subbottom Potential Channel 4-Channel 3
4	16:15	43.065° N 28.594° E	TRANSIT-2-229- 1457.XTF	11593	Side Scan Target 8 m Long 91 m Range Starboard - Channel 3
5	17:42	43.0123° N 28.578° E	LINE1-229- 1648.XTF	5860	CHANNEL - Visible on Sub-bottom
6	17:43	43.006° N 28.574° E	LINE1-229- 1648.XTF	6381 6381	CHANNEL on SBP
7	17:50	42.997° N 28.567° E	LINE1-229- 1648.XTF	7219	Asymmetric Channel SBP
8	18:24	42.954° N 28.533° E	LINE1-229- 1648.XTF		CABLE OUT OUT MISTAKE
9	19:10	42.902° N 28.487° E	LINE1-229- 1835.XTF	3866	Starboard 210M
10	21:21	42.9119° N 28.488° E	LINE2-229- 2049.XTF	3436	Sub-bottom Gully

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
11	21:39	LAT-42°55.599' N (42.926°N) LONG-28°30.050' E (28.5008°E)	LINE2-229- 2049.XTF	5543	Discontinuity (Fold/Fault) SBP
12	21:53	LAT-42.938°N LONG-28.510°N	LINE2-229- 2049.XTF	6917	Fault (SBP)
13	22:53	LAT-42.985°N LONG-28.549°E	LINE2-229- 2050.XTF	750	70m bubble in lower sediment (20m down) SBP
14	23:04	LAT-43.006°N LONG-28.562°E	LINE2-229- 2050.XTF	2638	Double-fault from surface down 20m SBP (triple anomaly)
15	23:12	LAT-43.007°N LONG-28.567°E	LINE2-229- 2050.XTF	3452	Hash (similar to (last target) → Markers
16	23:30	LAT-43.024°N LONG-28.580°E	LINE2-229- 2050.XTF	5582	Fault on subsurface Port side w/ features on high-freq. sidescan
17	23:55	LAT-43.044°N LONG-28.597°E	LINE2-229- 2050.XTF	8279	3 folds (SBP)
18	23:57	LAT-43.045°N LONG-28.596°E	LINE2-229- 2050.XTF	8442	Shadow area (high-freq) Clarified w/ geo-correction.
19	01:22	43° 1.167 N 28° 33.90 E	Line3-230-0109.XTF	1108	Geotarget a Subbottom channel 4-channel 12
20	01:30	43° 0.65 N 28° 33.48 E	Line3-230-0109.XTF	2043	Geotarget a Subbottom channel 4-channel 13

3 hash
marks

Slant range:
100m
PORT

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
21	04:41	42° 57.826 28° 30.675	LINE 4-230-0334.XTF	7173	Subbottom feature - channel 4-Channel 14
22	05:04	42° 59.56 28° 32.11	LINE 4-230-0334.XTF	10134	right before steep cliff, trough on SBP 4-Channel 15
23	05:26	43° 00.38 28° 32.77	LINE 4-230-0335.XTF	23 23	channel on SBP 4-Channel 16
24	05:40	43° 01.17 28° 33.39	LINE 4-230-0335.XTF	1862	trough on SBP 4-Channel 17
25	06:02	43° 02.21 28° 34.27	LINE 4-230-0335.XTF	433	channel on SBP 4-Channel 18
26	06:07	43° 02.51 28° 34.51	LINE 4-230-0335.XTF	4818	channel on SBP 4-Channel 19
* 27	06:39	43° 03.94 28° 35.54	LINE 4-230-0335.XTF	8481	object on sea floor
* 28	07:33	43° 02.52 28° 33.79	LINE 5-230-0711.XTF	2405	starboard 107M SSS 5-OBJECT 28
29	08:29	42° 59.28 28° 31.18	LINE 5-230-0711.XTF	8783	barrier target 15 M down LIMESTONE BEDROCK? SBP
30	15:29	42° 58.7659 28° 33.5765	T0217-230-1521.XTF	1716	Subbottom feature - Channel

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
* 31	18:05	043°00.755'N 028° 33.737'E	TURN 9B- 230-1801. XTF	1003	port side, slant range 137M SSS
32	18:55	42°58.7652'N 28°33.576'E	LINE 10-230- 1852.XTF	1713	gas seep mud volcano SBP
* 33	20:49	42°59.1931'N 28°33.1530'E	LINE 12-230- -2021.XTF	6390	object starboard SSS
34	21:11	42°57.840'N 028°36.064'E	LINE 13 230-2106	836	gas/mud vent Port Side 122m slant range
35	21:20	42°58.6441'N 42°58.274 28°33.618	LINE 13-230- 2106.XTF	876	gas vent SBP
* 36	21:45	42°56.2219'N 28°31.934'E	LINE 13-230- 2106.XTF	8893	strong return good shadow slant range 122m port
* 37	21:46	42°56.103'N 28°31.999'E	LINE 13-230- 2106.XTF	9027	Object starboard 20m slant range & identical returns & shadows
38	22:28	42°54.257'N 28°30.160'E	LINE 13-230- 2107.XTF	5440	Large fill gas vent (SBP, port & starboard SSS)
39	01:24	42°48.767'N 28°27.761'E	LINE 17-230- 0042.XTF	9611	Subbottom target- channel
40	01:56	42°50.454'N 28°28.242'E	Line 17-231-0042	3955	Side Scan Target wreck shape? 86m - starboard ch

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
41	02:32	42° 52.472'N 28° 28.418'E		51	Subbottom - Channel feature
42	02:35	42° 52.651'N 28° 28.808'E		826	Subbottom target - channel feature
43	05:34	42° 50.213'N 28° 27.7060'E	LINE 19-234 0427.XTF	2827	Starboard low frequency linear feature, hard return, no shadow
44	05:45	42° 50.5338'N 28° 27.6020'E	LINE 19-231- 0428.XTF	411	dark return in long linear feature SSS
45	15:50	43° 23.633 28° 44.890	Transit- test line - 233 - 1507.XTF	8731	Steamship ^{UPM}
46	17:08	43° 22.3151'N 28° 45.6171'E	LINE - 223-233 1645.XTF	4130	unidentifiable target, coincident w/ depth change
47	17:50	43° 19.6573'N 28° 47.0469'E	LINE - 223-233 1645.XTF	11799	hard return 2M DIAMETER, NO SHADOW, PORT SSS
48	18:08	43° 18.5492'N 28° 47.5577'E	LINE - 22- 233-1646.XTF	2554	PORT SIDE SSS LINEAR FEATURE, CABLE (?)
49	00:58	43° 14.4119'N 28° 36.726'E	Line 24-233-2255.XTF	9672	Side Scan Target - starboard side channel 3
50	03:50	43° 11.425'N 28° 34.778'E	Line 25-234- 0327.XTF	3706	Side Scan Target Port Side Channel 1

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

[illegible]

ROMANIAN SURVEY

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
1 - 09:25		44°03.6394'N 30°11.7815'E	LINE 1-235- 0809.XTF	11281	Possible amphora pile, but very large. 94m x 30m. Starboard 128 13m slant range. some relief. Surrounding features
2	10:02	44°05.1707'N 30°13.5370'E	LINE 1-235- 0810.XTF	4019	Small area (11m) high return. Slant = 250m port
3	10:54	44°04.3395'N 30°13.3315'E	LINE 2-235- 1023.XTF	4207	Port side Slant: 240m Narrow curve outline
4	11:09	44°03.6436'N 30°11.8709'E	LINE 2-235- 1023.XTF	6708	Area of high return 20m long. Starboard. Slant range - 260m
5	11:17	44°03.1387'N 30°11.2870'E	LINE 2-235- 1023.XTF	7828	Geolog. feature crosses screen. (SSS & SBP). Possible channel
6	11:05	44°01.273'N 30°09.053'E	Line 3-235-1226.XTF	5718	SSS - Starboard side 245 Range - 240 meters
7	13:46	44°02.844'N 30°11.393'E	Line 3-235-1226.XTF	11981	SSS & SBP - Possible shoreline
8	14:37	44°05.032 30°14.247	Line 3-235-1347.XTF	7390	SSS Targets 13x4 meters w/ relief starboard channel Slant Range 172 meters
9	15:06	44°05.082'N 30°15.172'E	Line 4-235-1456.XTF	1472	SSS Targets 6m x 2m Starboard channel Slant Range - 193 meters
10	16:09	44°02.616'N 30°11.492'E	Line 4-235-1456.XTF	10623	SSS Target Starboard channel Slant Range 250 meters

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
11	16:47	44°00.9739'N 30°09.1082'E	LINE4-235- 1614.XTF	4864	small target 25 M diameter SSS 4-channel-35
12	18:01	44°03.278'N 30°09.410'E	LINE 5-235- 1720.XTF	6100	interesting SBP feature
13	22:04	43°59.5883'N 30°09.1481'E	LINE7-235- 2155.XTF	7228	rectangular- shaped object slant - 200 m starboard
14	23:10	44°02.6558'N 30°13.1986'E	LINE7-235- 2155.XTF	10948	Small hole/depression 30 m wide 200 m wide 100 m to port
16	23:14	44°02.7434'N 30°13.7598'E	LINE7-235- 2155.XTF	11632	Very large geological feature - Cliff.
17	01:47	44° 0.226'N 30° 10.205'E	Line8-236-0132.XTF	1999	SSS Target - 30 m length x 1 m starboard channel slant range - 207
18	05:56	44°00.387'N 30°11.978'E	LINE-10-236- 0436.XTF	12192	Ink Blot SSS - Port side
19	06:17	43°59.447'N 30°13.655'E	LINE-10-236- 0436.XTF	2950	Small ink blot adjacent to trawl marks
20	09:29	44°03.5993'N 30°17.5802'E	LINE-12-236- 0924	619	Small strong return good shadow slant range - 129 m port
21	13:04	44°03.5993'N 44° 1.131'N 30° 14.562'N	Line 13-236-1253.XTF	1109	SSS Target 35 x 11 m starboard channel slant range 142

starboard
SSS

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
22	13:10	44° 1.402'N 30° 14.960'E	Line 13-236-1253.XTF	2205	SSS Target Starboard channel Slant Range - 142
23	14:52	44° 01.8700'N 30° 15.898'E	Line 14-236-1416.XTF	5225	SSS Target Starboard channel Terrace
24	15:36	44° 58.182'N 30° 11.389'E	Line 15-236-1621	1435	SSS Target Starboard channel Slant Range - 160m 1245m
25	18:27	44° 02.425'N 30° 17.551'E	LINE 15-236- 1622.XTF	6447	possible fault? terrace? geological feature starboard SSS
26	19:10	44° 02.145'N 30° 17.383'E	LINE 16-236- 1850.XTF	3019	possible terrace starboard SSS 4-channel-45
27	20:28	43° 58.675'N 30° 15.340'E	LINE 16-236- 1851.XTF	2294	starboard SSS 18M Reflection 4-channel-46
28	00:47	43° 59.090'N 30° 14.069'E	LINE 18-236- 2328.XTF	11323	Probable geological feature - Large slant range = 105m starboard
29	01:22	43° 57.378'N 30° 11.614'E	Line 18-237-0049.XTF	4501	Subbottom Target - Raised features - hidden in noise in sidescan
30	03:37	44° 0.943'N 30° 17.538'E	Line 19-237- 0254.XTF	5989	120m Shoreline Feature
31	21:02	43° 49.8694'N 30° 24.9652	LINE 23-232- 2016.XTF	4056	Large green high return, gaseous anomaly

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
32	22:23	43° 51.5026' N 30° 21.0271' E	VINE24-237 2125.XTF	8353	outcropping of high return slant range = 103 m Starboard
33	01:08	43° 44.526' N 30° 23.007' E	Line 25-238-0018.XTF	2637	SSS Target rebois field post channel Range 253 m
34	01:08	43° 44.498' N 30° 23.014' E	Line 25-238-0018	2665	SSS rebois field post channel Range 215
35	01:08	43° 44.513' N 30° 23.035' E	Line 25-238-0019	2707	Subbottom Target possible stream 0
36	01:30	43° 48.845' N 30° 23.094' E	Line 26-238-0126.XTF	773	SSS post channel slant range 79 m
37	02:02	43° 50.236' N 30° 21.678' E	Line 26-238-0126.XTF	5258	SSS Target 13 + 2 m starboard channel slant range 253
38	06:01	43° 49.979' N 30° 21.013' E	LINE 28- 238-0526. XTF	5387	range - 273 m starboard channel SSS 14x6 m
39	06:43	43° 51.830' N 30° 18.530' E	LINE 28- 0526.XTF	11650	starboard SSS Range = 243 m 4x11 m 1 m OFF BOTTOM
40	09:24	43° 48.1984' N 30° 22.1231' E	LINE-30-238 0917.XTF	889	Fault on SBP
41	9:33	43° 48.5962' N 30° 21.5448' E	LINE-30-238 0917.XTF	2253	Fault on SBP in gully

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
42	10:12	43° 50.3196' 30° 14.1174'	LINE-30-238- 0917.XTF	8065	PORT SIDE Slant Range 146m very high return (small object)
43	10:59	43° 50.5784'N 30° 16.2984'E	LINE-30-238- 0918.XTF	2948	Possible mud volcanoes Features on all channels
44	11:41	43° 51.3593'N 30° 17.3666'E	LINE 31-238- 1112.XTF	4078	High return w/ shadow. Slant range-174m starboard
45	13:09	43° 47.394'N 30° 22.018'E	Turn-31-238- 1302.XTF	6741	Port ch. 1 5m x 3m 247m Range
46	14:38	43° 51.367'N 30° 17.187'E	Line 32-238-1431	687	SSS - Starboard channel 2m x 7m slant range-188m
47	17:08	43° 47.1301'N 30° 21.5944'E	TURN-33- TURN-33- 238.1712.XTF	8091	SRP - river channel?
48	17:27	43° 47.872'N 30° 21.065'E	LINE-34- 238-1712.XTF	2284	SRP - interesting interesting channel
49	19:16	42° 34.978'N 28° 19.350'E	Line 01-239- 1257.XTF	11442	SSS Port channel Haze returns/shadow Slant range - 257
50	19:27	42° 21.71 42° 21.71 28° 19.72	LINE-02-239- 1852.XTF	5284	Port channel SSS, 1M x 8M target
51	20:40	42° 25.20'N 28° 20.09'E	LINE-02-239- 1853.XTF	3811	10M x 1/3M STARBOARD SSS IN DISTURBED AREA

IFE - BLACK SEA 2001 - TARGET LOCATION LOG

Target ID	Time	Location	File	Ping	Description
52	21:46	42°28.7005'N 28°19.9533'E	LINE02-239- 1854.XTF	841	4 m depression on SBP
* 53	23:34	42°24.9779'N 28°20.4588'E	LINE03-239- 2212.XTF	12045	6 areas of high return withing long black streak Slant range=200m starboard
* 54	04:58	42°28.098 28°21.951	LINE-05- 240-0428.XTF	4547	linear feature w/ distinct shadow starboard SSS 12M w/ 8M long shadow
55	05:51	42°25.050'N 28°22.254'E	LINE-05- 240-0429.XTF	68	port SSS crescent-shaped feature - no shadow 26M long
56	06:29	42°22.062'N 28°21.917'E	LINE-05- 240-0429.XTF	570	8Mx5M no shadow starboard SSS rectangular target
57	015:46	42°25.417'N 28°24.310'E	LINE8-240-1416.XTF	692 1112	sub bottom target - small channel feature
58	16:44	42°29.3239'N 28°24.3457'E	LINE8-240- 1537.XTF	9983	SBP possible channel
59	17:50	42°26.742'N 28°24.972'E	LINE-09- 240-1704.XTF	6897	Mud volcano, fault? SBP
60	23:01	42°28.9536'N 28°25.6535'E	LINE11-240- 2242.XTF	2502	6 equally spaced circles of high return slant range=161m starb.
* 61	01:27	42°19.699'N 28°26.052'E	LINE LINE11-240-0117.XTF	1271	SSS target starboard side Slant Range 133m

More
on port
ahead

[illegible]