

**HALEY &
ALDRICH**

**REPORT ON
ENGINEERED BACKFILL STUDY
ISLANDER EAST NATURAL GAS PIPELINE
BRANFORD, CONNECTICUT**

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS



**REPORT ON
ENGINEERED BACKFILL STUDY
ISLANDER EAST NATURAL GAS PIPELINE
BRANFORD, CONNECTICUT**

by

**Haley & Aldrich, Inc.
South Portland, Maine**

for

**Project Consulting Services, Inc.
Metairie, Louisiana**

**File No. 28178-002
May 2003**

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21 May 2003
File No. 28178-002

Project Consulting Services, Inc.
3300 West Esplanade Avenue
Suite 500
Metairie, Louisiana 70002-7406

Attention: Mr. Jim Elgin

Subject: Engineered Backfill Study
Islander East Natural Gas Pipeline
Branford, Connecticut

Ladies and Gentlemen:

This report presents the results of our engineered backfill study for the subject project. These services were completed in accordance with our proposal dated 23 April 2003.

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In summary, it is our opinion that the proposed backfill soils from Russo Brothers in Rocky Hill, Connecticut and Rawson Materials, Inc., of Putnam, Connecticut will be subject to long term scour (erosion) as underwater trench backfill. In our opinion, a backfill material consisting of a gravelly coarse to fine sand would perform acceptably without significant loss of material due to scour or dispersion of fine grained (silt size or smaller) during placement. Specific comments and recommendations are provided below.

INTRODUCTION

The Islander East natural gas pipeline crossing of Long Island Sound will be made from Branford, Connecticut to Wading River, New York. The underwater trench backfill study area is located between Milepost 10.9 and Milepost 12.0, approximately 4,000 ft. to 10,000 ft. off the coast of Branford. We understand that the pipeline will be placed in an approximately 4.5-ft. deep trench excavated through the existing near surface soils. Backfill immediately around the pipeline will consist of rock/gravel fill. The remainder of the trench is proposed to be filled with sand backfill. The trench will be excavated with clamshell equipment and the sand backfill will be placed by tremie pipe to minimize dispersion of fine-grained soil.

The purpose of our study is to evaluate proposed sand backfill materials available from local sources and provide comments and recommendations for:

- Suitability of proposed backfill
- Maximum height of free-fall (from sea bottom to bottom of tremie pipe) to minimize loss of fine grained soil
- Optimum size of tremie pipe
- Potential for long term scour of the backfill material

Prof. W. Frank Bohlen of the University of Connecticut Marine Sciences Department provided bottom orbital velocities and boundary shear stress values for waves of record for the time period 20 February 2002 to 4 April 2002. In addition, Prof. Bohlen provided information on critical shear stress for granular materials from studies by others.

PROPOSED BACKFILL MATERIAL

Islander East personnel provided two samples of proposed backfill material. One sample, designated S02, was obtained from Russo Brothers, Old Forge Road, Rocky Hill, Connecticut. The other sample, designated S01, was obtained from Rawson Materials, Inc. Town Farm Road, Putnam, Connecticut. Haley & Aldrich conducted grain size analyses (sieve and hydrometer tests) on the samples. The results are plotted on Grain Size Distribution curves included as Appendix A. Sample S01 consists of light brown SILT with sand (ML). It contains approximately 85 percent material passing the No. 200 sieve (silt size) and has a mean grain size (D_{50}) of 0.055 mm. Sample S02 consists of red brown silty SAND. It contains approximately 20 percent material passing the No. 200 sieve and has a mean grain size (D_{50}) of 0.2 mm. Based on the results of the hydrometer test for the material finer than a No. 200 sieve, the fine-grained material is non-plastic.

SEABOTTOM MATERIAL

Vibracore samples of the seabottom material within the limits of the study area (Milepost 10.9 to Milepost 12.0) include 10a, 10b, 12a and 12b. The samples were generally classified as lean CLAY to elastic SILT to ORGANIC CLAY and ORGANIC SILT. Properties include:

<u>VC No.</u>	<u>USCS Class.</u>	<u>Liquid Limit</u>	<u>Water Content (%)</u>	<u>Average Total Unit Weight (pcf)</u>	<u>Average Shear Strength (psf)</u>
10a	CL to MH	51.5	71.8	94.9	70
10b	OH to MH	70.2	104.4	89.6	70
12a	OH to MH	53.4	80.0	94.3	90
12b	OH	69.1	96.7	87.0	35
Average		61.0	88.2	91.5	65

TRENCH EXCAVATION

We understand that the trench will be excavated using an underwater clamshell bucket. The average shear strength of the seabottom material within the upper 5-ft. varied from approximately 35 lbs. per sq. ft. (psf) to 90 psf. Due to the plastic consistency and shear strength of the seabottom material, we anticipate that the sidewalls of the trench can be excavated to side slopes as steep as 1 horizontal to 1 vertical (1:1) or steeper. Results of slope stability analyses for the trench side slopes are included in Appendix B. Given a 10-ft. width at the bottom of the trench, the width of the top of the trench could be on the order of 20 ft. or less.

WATER VELOCITIES AND BOUNDARY SHEAR STRESS

Information provided by Prof. Bohlen indicates that at the inshore monitoring location, for the period 20 February 2002 to 4 April 2002, the maximum bottom orbital water velocity was on the order of 1.9 ft. per sec. (0.59 m per sec.) and maximum boundary shear stress at the seabed surface was 0.13 psf (6.25 Pa). Data for the offshore monitoring location indicates the maximum bottom orbital velocity was on the order of 0.9 ft. per sec. (0.27 m per sec.) and maximum boundary shear stress was 0.04 psf (1.95 Pa). The orbital velocities exceed the tidal current velocities and therefore have a greater impact on potential scour. Prof. Bohlen also provided results of studies by Shields (1936) and Lane (1955) regarding critical shear stress versus sediment size and insight into the behavior of sediment deposits. The wave data critical shear stress results are included as Appendix C.

ANTICIPATED BACKFILL PERFORMANCE

Based on the results presented by Shields and Lane and the wave data, the critical shear stress, τ_c , for the fine sand (proposed backfill material from Russo Brothers pit) is approximately 0.005psf (0.25 N/sq. m). The wave data indicates that waves generating shear stresses greater than this level occur approximately 28 percent of the time inshore and 13.2 percent of the time offshore. In our opinion, fine sand would be subject to significant scour with time and thus the proposed sand from Russo Brothers would not be acceptable for trench backfill.

To minimize the potential for long term scour, we evaluated the required minimum mean grain size. Per Shields and Lane, τ_c for $D_{50} = 2.0$ is approximately 0.03 psf. The percent exceedance of waves generating shear stresses greater than this is approximately 5.5 percent inshore and 0.5 percent offshore. At these levels there may be some movement of particles finer than 2.0 mm but this would be compensated for by the 50 percent of the particles greater than 2.0 mm.

In our opinion, a gravelly coarse to fine sand as backfill would provide acceptable performance and minimize the potential for long term scour. Materials of this type are frequently used in building and highway earth fills and are typically readily available.

CONCLUSIONS AND RECOMMENDATIONS

In our opinion, the silty sand from the Russo Brothers source will not meet the project needs for backfill. Previous studies and wave data indicate that the sand would be subject to significant scour when placed in the trench.

We recommend that the excavated trench be backfilled with a gravelly coarse to fine sand also referred to as "bank-run gravel." It should be free of organic material, loam, trash, snow, ice, frozen soil and other objectionable material, and should conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
2 in.	100
No. 4	30 to 80
No. 40	10 to 50
No. 200	0 to 20

In addition, if excavating steep side slopes can minimize the width of the excavated trench, the width of exposed backfill will be limited to 20 ft. or less and further reduce the potential for scour.

In our opinion, the proposed gravelly coarse to fine sand backfill can be placed by tremie methods. We recommend that the tremie pipe have a minimum diameter of 18 in. to limit the potential for bridging of the backfill in the tremie tube during placement. In order to minimize the amount of fine material in the backfill suspended in water, we recommend that provisions be made to adjust the length of the tremie pipe so that the bottom of the tremie pipe is not more than 3 ft. above the original seabottom as determined at the side of the trench.

LIMITATIONS OF RECOMMENDATIONS

This report has been prepared for specific application to the subject project in accordance with generally accepted geotechnical engineering practices. In the event that any changes in the nature, design or location of the pipeline is planned, the conclusions and recommendations contained in this report should not be considered valid, unless the changes are reviewed and the conclusions of this report modified or verified in writing.

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The recommendations presented herein are based in part on the data obtained from the referenced vibracore samples and proposed borrow materials. The nature and extent of variations between the vibracore samples may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

We request that we be provided the opportunity for a general review of final design in order to determine that our earthwork and foundation recommendations have been interpreted and implemented in the design as they were intended.

It has been a pleasure to work with you on this project. Please do not hesitate to contact us if you have any questions or require additional information.

Sincerely yours,
HALEY & ALDRICH, INC.


Kenneth L. Recker, P.E.

Consultant


James W. Weaver, P.E.

Vice President

Enclosures:

- | | |
|------------|--|
| Appendix A | - Grain Size Distribution |
| Appendix B | - Trench Slope Stability Results |
| Appendix C | - Inshore and Offshore Wave Data and Critical Shear Stress Results |

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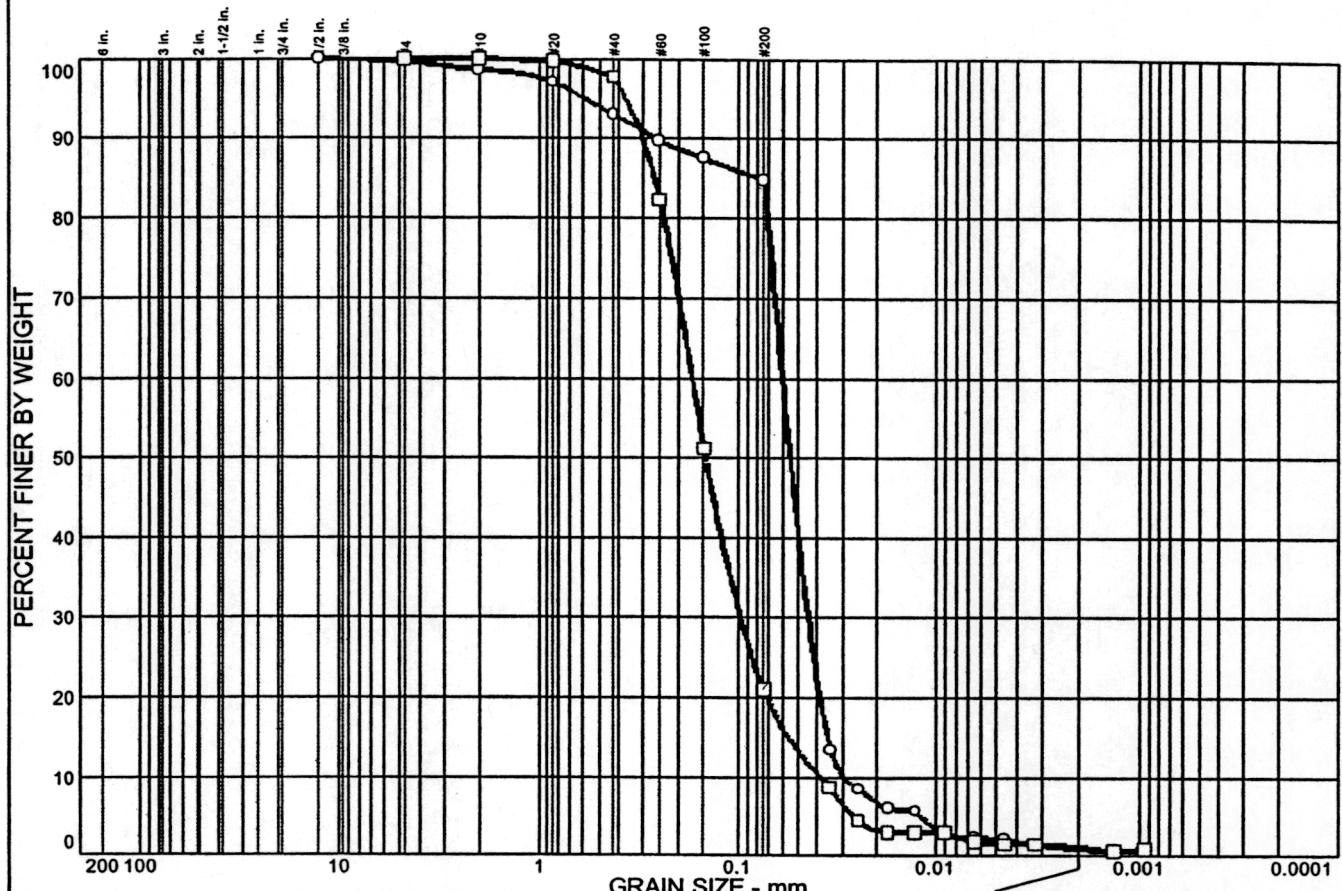


APPENDIX A

Grain Size Distribution



U.S. STANDARD SIEVE SIZE



% + 3"	% GRAVEL		% SAND			% FINE	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
○	0.0	0.0	0.2	1.1	5.7	84.1	0.8
□	0.0	0.0	0.0	0.0	2.2	76.8	1.2

Expl. No.	Sample No.	Depth (ft)	Atterberg Limits %			Water Content (%)	C_u	C_c	USCS
			WL	WP	IP				
○	S01					7.4	2.04	1.12	ML
□	S02					8.3	4.46	1.46	SM

Sample Description

○ Light brown Silt with sand

□ Red brown Silty sand

Remarks:

- Source: Rawson Materials, Putnam, Connecticut
- Source: Russo Brothers, Rocky Hill, Connecticut



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Islander East Pipeline
Branford, Connecticut

GRAIN SIZE DISTRIBUTION

DATE: 5/14/2003

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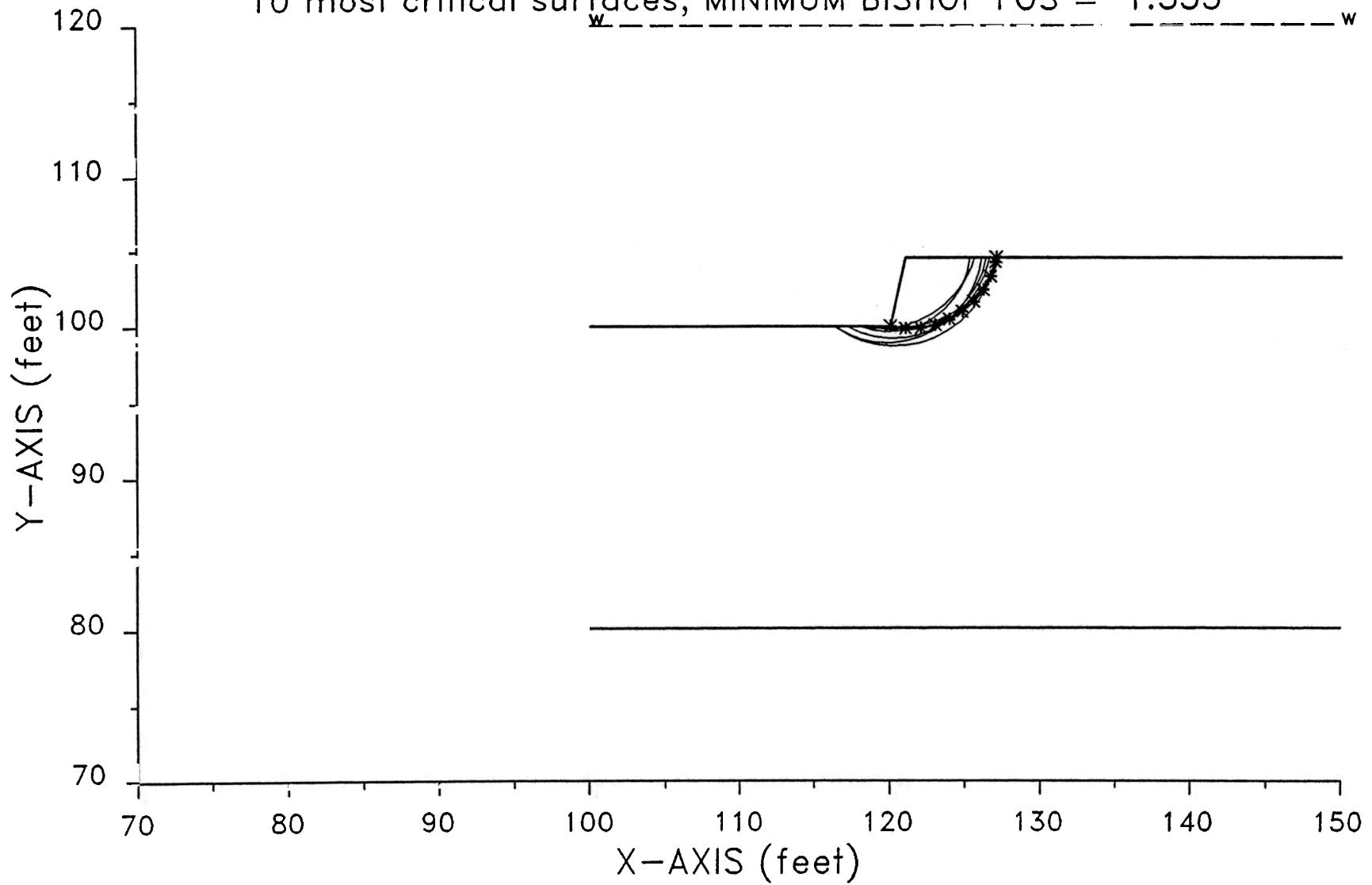
APPENDIX B
Trench Slope Stability Results



DPE2 5-19-** 10:57

Islander East D Slope, Ver, $S_u = 40 \text{ psf}$

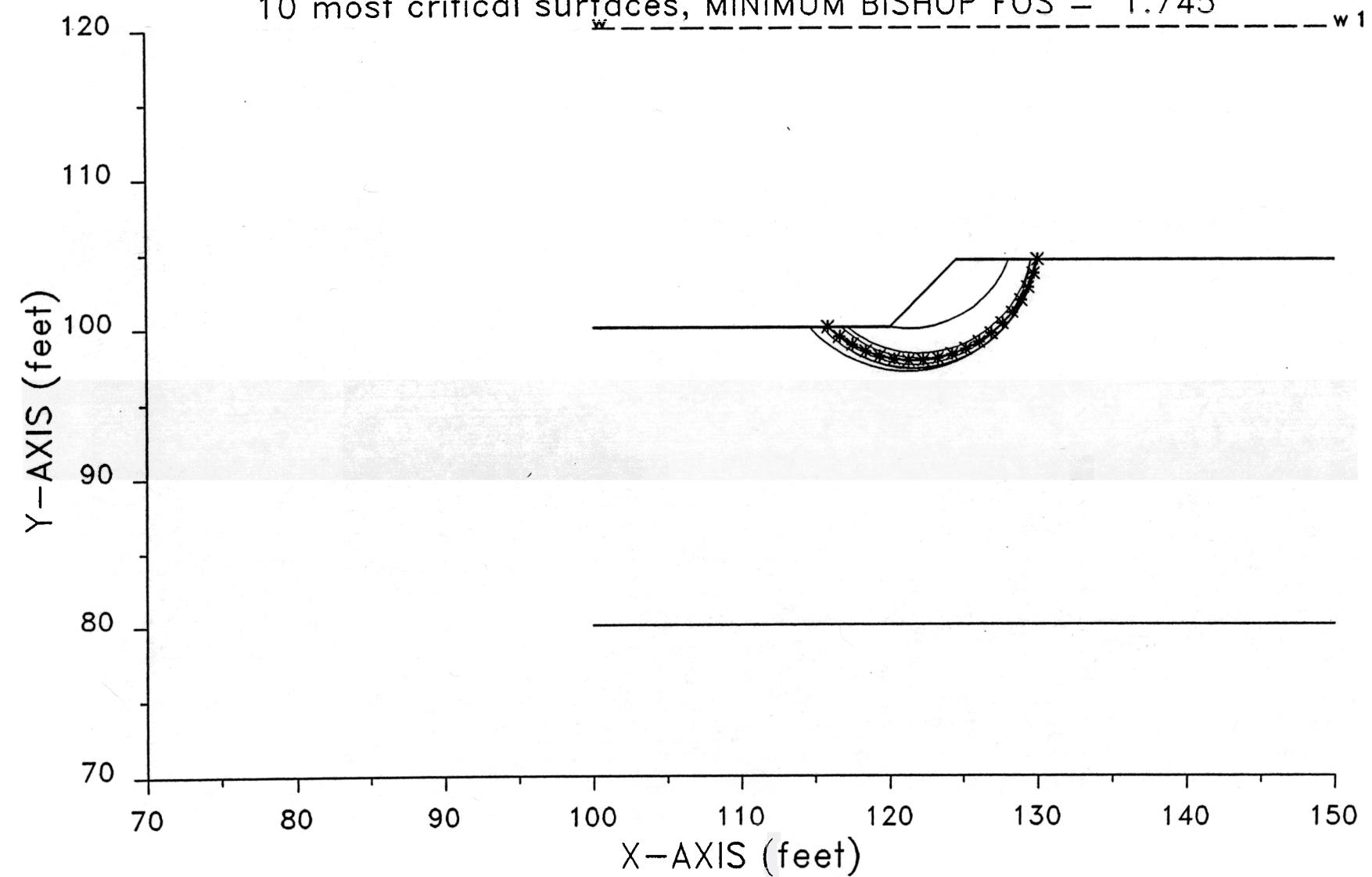
10 most critical surfaces, MINIMUM BISHOP FOS = 1.353



OPE1 5-19-** 10:51

Islander East D Slope, 1:1, $S_u = 40 \text{ psf}$

10 most critical surfaces, MINIMUM BISHOP FOS = 1.745



APPENDIX C

Inshore and Offshore Wave Data and Critical Shear Stress Results

INSHORE STATION

surface wave processing summary:

file = brin0404.wb

temperature = 6.000

salinity = 27.000

density = 1021.238

number of points per wave burst = 2048

sample period = 0.50 sec

burst # 0:

mean pressure = 22.651 psia

instrument depth = 5.474 meters

total water depth = 6.474 meters

auto-spectrum:

24 spectral estimates per band

21 bands calculated

each band is 0.023 Hz wide

frequency span = 0.012 to 0.481 Hz

MM/DD/YYYY HH:MM	SIG.HT	SIG.PER	ENERGY (CM.SQ.)										btm orb (m/s)	btm shear (N/m ²)
			(CM)	(SEC)	22+	20	17	15	13	11	9	7	5	3
02/20/2002 14:31	20	3	0	0	0	0	0	0	0	0	1	23	1.2420667e-002	6.7827770e-002
02/20/2002 17:31	10	2	0	0	0	0	0	0	0	0	0	6	3.1310596e-003	2.9853372e-002
02/20/2002 20:31	4	2	0	0	0	0	0	0	0	0	0	0	2.8174600e-003	2.5063397e-002
02/20/2002 23:31	18	3	0	0	0	0	0	0	0	0	0	20	1.4919110e-002	8.3007390e-002
02/21/2002 02:31	13	2	0	0	0	0	0	0	0	0	0	11	4.7343834e-003	3.5298139e-002
02/21/2002 05:31	6	2	0	0	0	0	0	0	0	0	0	2	6.9249990e-004	2.3227087e-002
02/21/2002 08:31	3	82	0	0	0	0	0	0	0	0	0	0	2.3368047e-003	2.1483200e-002
02/21/2002 11:31	4	82	0	0	0	0	0	0	0	0	0	1	3.7979215e-003	2.8239006e-002

02/21/2002 14:31	19	3	0	0	0	0	0	0	0	0	0	22	1.3066861e-002	7.2508121e-002
02/21/2002 17:31	12	2	0	0	0	0	0	0	0	0	0	9	3.3428060e-003	3.1455081e-002
02/21/2002 20:31	52	3	0	0	0	0	0	0	0	0	4	149	1.0274250e-001	5.9178377e-001
02/21/2002 23:31	99	4	1	0	0	0	0	0	0	0	261	195	2.1193393e-001	1.5845975e+000
02/22/2002 02:31	77	4	0	0	0	0	0	0	0	0	186	185	1.3687877e-001	8.3980873e-001
02/22/2002 05:31	35	3	0	0	0	0	0	0	0	3	75	4.3624743e-002	2.1391873e-001	
02/22/2002 08:31	15	2	0	0	0	0	0	0	0	0	13	1.0071487e-002	6.0853317e-002	
02/22/2002 11:31	12	2	0	0	0	0	0	0	0	0	9	7.2444151e-003	5.1735209e-002	
02/22/2002 14:31	4	2	0	0	0	0	0	0	0	0	1	1.4867984e-003	2.2368681e-002	
02/22/2002 17:31	6	2	0	0	0	0	0	0	0	0	2	3.4889253e-003	2.8593479e-002	
02/22/2002 20:31	19	3	0	0	0	0	0	0	0	0	21	1.9812592e-002	1.0342824e-001	
02/22/2002 23:31	9	3	0	0	0	0	0	0	0	0	5	1.3575943e-002	7.0870654e-002	
02/23/2002 02:31	9	2	0	0	0	0	0	0	0	0	5	3.1552515e-003	3.1386968e-002	
02/23/2002 05:31	24	3	0	0	0	0	0	0	0	0	36	9.2605011e-003	5.7181529e-002	
02/23/2002 08:31	37	3	0	0	0	0	0	0	0	0	84	3.9012361e-002	2.0548528e-001	
02/23/2002 11:31	31	3	0	0	0	0	0	0	0	1	50	4.6308390e-002	2.5164490e-001	
02/23/2002 14:31	21	3	0	0	0	0	0	0	0	0	25	2.6562207e-002	1.3860440e-001	
02/23/2002 17:31	26	3	0	0	0	0	0	0	0	1	42	3.0100054e-002	1.4967694e-001	
02/23/2002 20:31	17	3	0	0	0	0	0	0	0	1	15	1.8394960e-002	9.1427730e-002	
02/23/2002 23:31	11	3	0	0	0	0	0	0	0	0	7	1.1664259e-002	6.7083885e-002	
02/24/2002 02:31	7	2	0	0	0	0	0	0	0	0	3	6.4541686e-003	4.2168583e-002	
02/24/2002 05:31	6	3	0	0	0	0	0	0	0	0	2	5.2173601e-003	3.1875897e-002	
02/24/2002 08:31	6	3	0	0	0	0	0	0	0	0	2	8.9740838e-003	4.2665372e-002	
02/24/2002 11:31	5	3	0	0	0	0	0	0	0	0	1	5.8323321e-003	3.6612126e-002	
02/24/2002 14:31	5	3	0	0	0	0	0	0	0	0	1	7.9402930e-003	4.4822906e-002	
02/24/2002 17:31	20	3	0	0	0	0	0	0	0	0	25	9.9054924e-003	6.1042193e-002	
02/24/2002 20:31	8	2	0	0	0	0	0	0	0	0	4	3.6084513e-003	2.9173221e-002	
02/24/2002 23:31	3	3	0	0	0	0	0	0	0	0	0	1.6026691e-003	2.2959322e-002	
02/25/2002 02:31	2	2	0	0	0	0	0	0	0	0	0	5.6887059e-004	2.3737131e-002	
02/25/2002 05:31	4	3	0	0	0	0	0	0	0	0	1	2.1372350e-003	2.1608972e-002	
02/25/2002 08:31	3	3	0	0	0	0	0	0	0	0	0	2.3407376e-003	1.9322586e-002	
02/25/2002 11:31	5	3	0	0	0	0	0	0	0	0	1	5.5114895e-003	3.3652222e-002	
02/25/2002 14:31	6	2	0	0	0	0	0	0	0	0	1	4.2972475e-003	3.5430188e-002	
02/25/2002 17:31	6	2	0	0	0	0	0	0	0	0	2	4.5616071e-003	3.2966674e-002	

02/25/2002 20:31	12	2	0	0	0	0	0	0	0	0	0	9	3.1125254e-003	2.9347191e-002
02/25/2002 23:31	7	2	0	0	0	0	0	0	0	0	0	2	9.8724018e-004	2.5458015e-002
02/26/2002 02:31	7	2	0	0	0	0	0	0	0	0	0	1	2.9891349e-003	3.2207897e-002
02/26/2002 05:31	2	2	0	0	0	0	0	0	0	0	0	0	6.8664108e-004	1.9628200e-002
02/26/2002 08:31	5	2	0	0	0	0	0	0	0	0	0	2	1.3534778e-003	2.0436667e-002
02/26/2002 11:31	4	2	0	0	0	0	0	0	0	0	0	1	1.4829546e-003	2.2734380e-002
02/26/2002 14:31	12	4	0	0	0	0	0	0	0	0	6	2	4.7381305e-002	1.8407256e-001
02/26/2002 17:31	25	2	0	0	0	0	0	0	0	0	0	35	2.1558325e-002	1.1921524e-001
02/26/2002 20:31	24	3	0	0	0	0	0	0	0	0	0	37	2.0323720e-002	1.0271167e-001
02/26/2002 23:31	15	3	0	0	0	0	0	0	0	0	0	14	6.5666435e-003	4.4909766e-002
02/27/2002 02:31	25	3	0	0	0	0	0	0	0	0	0	36	3.8548706e-002	2.0626777e-001
02/27/2002 05:31	11	3	0	0	0	0	0	0	0	0	0	6	7.5205239e-003	4.9434227e-002
02/27/2002 08:31	4	2	0	0	0	0	0	0	0	0	0	1	9.1165508e-004	2.0056101e-002
02/27/2002 11:31	8	2	0	0	0	0	0	0	0	0	0	4	1.7245835e-003	2.3982101e-002
02/27/2002 14:31	29	3	0	0	0	0	0	0	0	0	0	50	4.1453909e-002	2.2509177e-001
02/27/2002 17:31	56	4	0	0	0	0	0	0	0	0	30	111	1.1872509e-001	7.5521794e-001
02/27/2002 20:31	65	4	0	0	0	0	0	0	0	0	97	166	1.3057155e-001	7.6884244e-001
02/27/2002 23:31	93	4	0	0	0	0	0	0	0	0	282	263	1.8660101e-001	1.2445778e+000
02/28/2002 02:31	46	4	0	0	0	0	0	0	0	20	84	9.8635919e-002	5.8663682e-001	
02/28/2002 05:31	20	4	1	0	0	0	0	0	0	4	17	4.1944029e-002	2.1066160e-001	
02/28/2002 08:31	11	3	0	0	0	0	0	0	0	0	7	5.2005885e-003	3.6121300e-002	
02/28/2002 11:31	22	3	0	0	0	0	0	0	0	1	29	1.3304427e-002	7.0573026e-002	
02/28/2002 14:31	21	3	0	0	0	0	0	0	0	0	25	3.1566298e-002	1.6226518e-001	
02/28/2002 17:31	37	3	0	0	0	0	0	0	0	7	72	9.9771307e-002	5.9824078e-001	
02/28/2002 20:31	25	4	0	0	0	0	0	0	0	1	13	23	6.6819497e-002	3.1183976e-001
02/28/2002 23:31	94	5	1	0	0	0	0	0	64	279	211	2.5481775e-001	1.7949736e+000	
03/01/2002 02:31	91	2	1	0	0	0	0	0	27	183	192	2.8387660e-001	2.1874042e+000	
03/01/2002 05:31	90	5	2	0	0	0	0	0	0	15	246	130	3.8942851e-001	3.2257048e+000
03/01/2002 08:31	73	5	1	0	0	0	0	0	0	10	160	114	2.5371691e-001	1.7419824e+000
03/01/2002 11:31	62	4	0	0	0	0	0	0	5	109	125	1.3796501e-001	7.9776004e-001	
03/01/2002 14:31	45	4	0	0	0	0	0	0	0	35	72	9.5955929e-002	5.4664293e-001	
03/01/2002 17:31	37	3	0	0	0	0	0	0	0	7	65	9.4563091e-002	5.6744552e-001	
03/01/2002 20:31	22	3	0	0	0	0	0	0	0	0	1	26	3.4910970e-002	1.7527827e-001
03/01/2002 23:31	15	3	0	0	0	0	0	0	0	0	0	14	7.1643430e-003	4.4146815e-002

03/02/2002 02:31	6	3	0	0	0	0	0	0	0	0	2	3.0658013e-003	2.8145263e-002	
03/02/2002 05:31	28	2	0	0	0	0	0	0	0	0	38	1.8281149e-002	1.1787945e-001	
03/02/2002 08:31	47	3	0	0	0	0	0	0	0	0	23	95	8.8828785e-002	5.1504178e-001
03/02/2002 11:31	61	2	0	0	0	0	0	0	0	0	25	204	5.8642858e-002	3.1494799e-001
03/02/2002 14:31	73	4	0	0	0	0	0	0	0	0	93	199	1.3659604e-001	8.4123821e-001
03/02/2002 17:31	68	3	0	0	0	0	0	0	0	0	12	214	1.3545711e-001	9.1209297e-001
03/02/2002 20:31	43	3	0	0	0	0	0	0	0	0	7	97	7.9350794e-002	4.5677106e-001
03/02/2002 23:31	19	3	0	0	0	0	0	0	0	0	0	22	1.2899234e-002	6.8922618e-002
03/03/2002 02:31	6	2	0	0	0	0	0	0	0	0	2	1.4777311e-003	2.2869737e-002	
03/03/2002 05:31	5	2	0	0	0	0	0	0	0	0	1	2.7781692e-003	2.9624132e-002	
03/03/2002 08:31	4	2	0	0	0	0	0	0	0	0	0	6.7570107e-004	2.7686349e-002	
03/03/2002 11:31	7	2	0	0	0	0	0	0	0	0	3	2.1146451e-003	2.4852144e-002	
03/03/2002 14:31	48	4	0	0	0	0	0	0	0	0	7	135	7.0171965e-002	3.6186010e-001
03/03/2002 17:31	28	4	0	0	0	0	0	0	0	0	13	34	6.2090539e-002	3.1875525e-001
03/03/2002 20:31	12	3	0	0	0	0	0	0	0	0	0	7	1.4628474e-002	8.0528845e-002
03/03/2002 23:31	31	3	0	0	0	0	0	0	0	0	6	52	5.5050805e-002	2.6755420e-001
03/04/2002 02:31	38	4	0	0	0	0	0	0	0	0	39	52	6.7732134e-002	3.3929012e-001
03/04/2002 05:31	96	2	2	0	0	0	0	0	0	2	204	278	2.1556357e-001	1.5392712e+000
03/04/2002 08:31	98	4	1	0	0	0	0	0	0	1	377	141	4.1319239e-001	3.4986324e+000
03/04/2002 11:31	30	4	0	0	0	0	0	0	0	0	16	37	5.5480577e-002	2.7442938e-001
03/04/2002 14:31	20	2	0	0	0	0	0	0	0	0	0	25	1.1160121e-002	6.3347464e-002
03/04/2002 17:31	16	2	0	0	0	0	0	0	0	0	0	14	1.2177716e-002	7.2276679e-002
03/04/2002 20:31	15	2	1	0	0	0	0	0	0	0	0	11	1.3414052e-002	8.2337349e-002
03/04/2002 23:31	22	3	0	0	0	0	0	0	0	0	0	30	2.2356540e-002	1.1623732e-001
03/05/2002 02:31	16	3	0	0	0	0	0	0	0	0	1	14	2.0562913e-002	9.4196518e-002
03/05/2002 05:31	17	4	0	0	0	0	0	0	0	0	8	10	5.5811189e-002	2.4325138e-001
03/05/2002 08:31	17	3	0	0	0	0	0	0	0	0	2	16	5.1622306e-002	2.5123374e-001
03/05/2002 11:31	20	3	0	0	0	0	0	0	0	0	3	20	3.1964624e-002	1.6026664e-001
03/05/2002 14:31	25	3	0	0	0	0	0	0	0	0	2	37	2.7508408e-002	1.3509057e-001
03/05/2002 17:31	31	4	0	0	0	0	0	0	0	0	6	53	6.8391844e-002	3.4718836e-001
03/05/2002 20:31	15	3	0	0	0	0	0	0	0	0	1	12	4.6689286e-002	2.2149053e-001
03/05/2002 23:31	10	3	0	0	0	0	0	0	0	0	1	6	1.8091332e-002	8.7430640e-002
03/06/2002 02:31	17	3	0	0	0	0	0	0	0	0	0	18	8.7735454e-003	5.3402688e-002
03/06/2002 05:31	53	4	0	0	0	0	0	0	0	0	33	125	9.7188458e-002	5.4353468e-001

03/06/2002 08:31	36	3	0	0	0	0	0	0	0	8	62	6.9900757e-002	3.9453226e-001	
03/06/2002 11:31	29	2	0	0	0	0	0	0	0	2	41	3.1201652e-002	1.7458062e-001	
03/06/2002 14:31	85	4	0	0	0	0	0	0	0	170	281	1.2018411e-001	7.6279502e-001	
03/06/2002 17:31	51	4	0	0	0	0	0	0	0	46	114	1.0013057e-001	5.5839194e-001	
03/06/2002 20:31	35	4	0	0	0	0	0	0	0	26	41	8.6511261e-002	4.6666058e-001	
03/06/2002 23:31	38	3	0	0	0	0	0	0	0	10	69	5.5582304e-002	3.1245967e-001	
03/07/2002 02:31	46	3	0	0	0	0	0	0	0	21	114	8.5887831e-002	4.7030687e-001	
03/07/2002 05:31	60	4	0	0	0	0	0	0	0	60	167	8.5249782e-002	4.7150315e-001	
03/07/2002 08:31	40	3	0	0	0	0	0	0	0	7	84	6.6997251e-002	3.7084409e-001	
03/07/2002 11:31	17	2	0	0	0	0	0	0	0	0	16	1.9191418e-002	1.0752195e-001	
03/07/2002 14:31	54	4	2	0	0	0	0	0	0	45	120	1.1620281e-001	6.8698632e-001	
03/07/2002 17:31	61	4	0	0	0	0	0	0	0	30	199	1.0698475e-001	6.1269008e-001	
03/07/2002 20:31	58	4	0	0	0	0	0	0	0	20	154	1.0811507e-001	6.5510077e-001	
03/07/2002 23:31	54	4	0	0	0	0	0	0	0	29	110	1.2415051e-001	7.8904136e-001	
03/08/2002 02:31	34	4	0	0	0	0	0	0	0	2	68	6.0608578e-002	3.1457499e-001	
03/08/2002 05:31	23	3	0	0	0	0	0	0	0	0	34	1.8762967e-002	9.5583489e-002	
03/08/2002 08:31	7	2	0	0	0	0	0	0	0	0	3	2.7514065e-003	2.8471025e-002	
03/08/2002 11:31	5	2	0	0	0	0	0	0	0	0	1	2.6459270e-003	2.9988095e-002	
03/08/2002 14:31	4	3	0	0	0	0	0	0	0	0	1	3.5318069e-003	2.8793867e-002	
03/08/2002 17:31	5	2	0	0	0	0	0	0	0	0	1	2.5184255e-003	2.3978929e-002	
03/08/2002 20:31	4	2	0	0	0	0	0	0	0	0	1	1.8845868e-003	2.2710810e-002	
03/08/2002 23:31	13	2	0	0	0	0	0	0	0	0	10	7.7932686e-003	5.3384151e-002	
03/09/2002 02:31	3	2	0	0	0	0	0	0	0	0	0	1.3785906e-003	2.2070899e-002	
03/09/2002 05:31	7	3	0	0	0	0	0	0	0	0	3	2.3495761e-003	2.4454409e-002	
03/09/2002 08:31	8	3	0	0	0	0	0	0	0	0	4	5.7014723e-003	3.5987461e-002	
03/09/2002 11:31	5	3	0	0	0	0	0	0	0	0	2	5.5146041e-003	3.5995545e-002	
03/09/2002 14:31	10	3	0	0	0	0	0	0	0	0	6	1.4328134e-002	7.3681400e-002	
03/09/2002 17:31	14	3	0	0	0	0	0	0	0	0	12	8.1656404e-003	5.0088667e-002	
03/09/2002 20:31	11	3	0	0	0	0	0	0	0	0	7	9.3095548e-003	5.0584129e-002	
03/09/2002 23:31	6	2	0	0	0	0	0	0	0	0	2	5.3645882e-003	3.5723168e-002	
03/10/2002 02:31	3	2	0	0	0	0	0	0	0	0	0	3.0398945e-003	2.6649531e-002	
03/10/2002 05:31	5	2	0	0	0	0	0	0	0	0	1	2.3651833e-003	2.3991247e-002	
03/10/2002 08:31	10	2	0	0	0	0	0	0	1	0	0	5	3.6462528e-003	2.9158688e-002
03/10/2002 11:31	5	3	0	0	0	0	0	0	0	0	1	2.5447029e-003	2.6457241e-002	

03/10/2002 14:31	4	4	0	0	0	0	0	0	0	0	1	7.9301753e-003	4.0748056e-002	
03/10/2002 17:31	24	3	0	0	0	0	0	0	0	0	36	2.8749318e-002	1.4731175e-001	
03/10/2002 20:31	25	3	0	0	0	0	0	0	0	0	39	1.9249662e-002	9.8561664e-002	
03/10/2002 23:31	127	4	1	0	0	0	0	0	0	0	395	8.6739616e-002	5.7700993e-001	
03/11/2002 02:31	169	5	6	0	1	0	1	0	1	24	1085	301	5.9591295e-001	6.2482421e+000
03/11/2002 05:31	84	5	0	0	0	0	0	0	0	5	267	128	2.7228755e-001	1.9565653e+000
03/11/2002 08:31	99	4	1	0	0	0	0	0	0	22	334	261	2.4451297e-001	1.7171028e+000
03/11/2002 11:31	81	5	1	0	0	0	0	0	0	3	145	183	2.0918449e-001	1.4765504e+000
03/11/2002 14:31	76	5	1	0	0	0	0	0	0	7	124	172	2.8648603e-001	2.2052561e+000
03/11/2002 17:31	86	4	1	0	0	0	0	0	0	15	174	195	2.6125037e-001	1.9545131e+000
03/11/2002 20:31	67	5	0	0	0	0	0	0	0	6	125	123	1.6529286e-001	1.0321737e+000
03/11/2002 23:31	63	5	0	0	0	0	0	0	0	6	108	113	2.0742360e-001	1.3280659e+000
03/12/2002 02:31	62	4	0	0	0	0	0	0	0	2	70	122	2.0417071e-001	1.4305055e+000
03/12/2002 05:31	58	4	0	0	0	0	0	0	0	1	64	117	1.3389942e-001	8.4765389e-001
03/12/2002 08:31	67	4	0	0	0	0	0	0	0	2	102	174	1.5704236e-001	9.6600137e-001
03/12/2002 11:31	39	3	0	0	0	0	0	0	0	0	20	71	7.6086165e-002	4.0460549e-001
03/12/2002 14:31	23	2	0	0	0	0	0	0	0	0	1	25	2.2040471e-002	1.2778182e-001
03/12/2002 17:31	53	4	0	0	0	0	0	0	0	0	11	137	9.8162503e-002	5.8902305e-001
03/12/2002 20:31	33	3	0	0	0	0	0	0	0	0	3	66	3.8988513e-002	1.9781746e-001
03/12/2002 23:31	67	3	0	0	0	0	0	0	0	0	6	278	1.0858639e-001	6.4164862e-001
03/13/2002 02:31	41	3	0	0	0	0	0	0	0	0	0	93	5.6359812e-002	3.2697806e-001
03/13/2002 05:31	44	3	0	0	0	0	0	0	0	0	1	105	5.8873161e-002	3.3789697e-001
03/13/2002 08:31	27	3	0	0	0	0	0	0	0	0	0	44	2.8164876e-002	1.3988189e-001
03/13/2002 11:31	13	2	0	0	0	0	0	0	0	0	0	10	5.0061503e-003	3.7317773e-002
03/13/2002 14:31	11	2	0	0	0	0	0	0	0	0	0	7	5.8703730e-003	4.5690817e-002
03/13/2002 17:31	6	2	0	0	0	0	0	0	0	0	0	1	2.2247841e-003	2.9149514e-002
03/13/2002 20:31	2	82	0	0	0	0	0	0	0	0	0	0	2.6303750e-003	1.9890644e-002
03/13/2002 23:31	2	2	0	0	0	0	0	0	0	0	0	0	1.7358970e-003	1.7850842e-002
03/14/2002 02:31	3	4	0	0	0	0	0	0	0	0	0	0	3.9809707e-003	2.6476902e-002
03/14/2002 05:31	3	3	0	0	0	0	0	0	0	0	0	0	1.7026956e-003	2.3307446e-002
03/14/2002 08:31	12	2	0	0	0	0	0	0	0	0	0	9	5.5708661e-003	3.9808011e-002
03/14/2002 11:31	7	3	0	0	0	0	0	0	0	0	0	3	4.0278207e-003	2.8633053e-002
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03/14/2002 17:31	3	3	0	0	0	0	0	0	0	0	0	0	4.4837260e-003	3.0429699e-002



03/14/2002 20:31	3	82	0	0	0	0	0	0	0	0	0	2.6131353e-003	2.2735740e-002
03/14/2002 23:31	3	82	0	0	0	0	0	0	0	0	0	2.6058941e-003	1.9698488e-002
03/15/2002 02:31	2	82	0	0	0	0	0	0	0	0	0	1.5296569e-003	2.0298758e-002
03/15/2002 05:31	2	82	0	0	0	0	0	0	0	0	0	9.8809291e-004	2.3523323e-002
03/15/2002 08:31	3	2	0	0	0	0	0	0	0	0	0	1.5239888e-003	2.1044176e-002
03/15/2002 11:31	50	3	0	0	0	0	0	0	0	1	154	3.3652489e-002	1.7851648e-001
03/15/2002 14:31	46	3	0	0	0	0	0	0	0	1	125	5.6610748e-002	3.1208991e-001
03/15/2002 17:31	23	3	0	0	0	0	0	0	0	0	27	2.1705865e-002	1.2519832e-001
03/15/2002 20:31	7	2	0	0	0	0	0	0	0	0	2	2.6707559e-003	2.8127862e-002
03/15/2002 23:31	3	2	0	0	0	0	0	0	0	0	0	5.7764480e-004	2.1250727e-002
03/16/2002 02:31	6	2	0	0	0	0	0	0	0	0	2	2.0149111e-003	2.6701221e-002
03/16/2002 05:31	6	2	0	0	0	0	0	0	0	0	1	1.6317284e-003	2.9029703e-002
03/16/2002 08:31	6	2	0	0	0	0	0	0	0	0	1	3.8287921e-003	3.2058080e-002
03/16/2002 11:31	5	2	0	0	0	0	0	0	0	0	1	1.3892890e-003	2.0651132e-002
03/16/2002 14:31	19	3	0	0	0	0	0	0	0	0	22	1.2449619e-002	7.3786146e-002
03/16/2002 17:31	31	3	0	0	0	0	0	0	0	1	56	6.9861529e-002	3.8444700e-001
03/16/2002 20:31	9	3	0	0	0	0	0	0	0	0	5	3.9140188e-003	3.3747074e-002
03/16/2002 23:31	3	2	0	0	0	0	0	0	0	0	1	9.2230328e-004	2.0517266e-002
03/17/2002 02:31	8	2	0	0	0	0	0	0	0	0	4	2.1056100e-003	2.6976979e-002
03/17/2002 05:31	2	82	0	0	0	0	0	0	0	0	0	3.4076469e-003	2.4898670e-002
03/17/2002 08:31	4	82	0	0	0	0	0	0	0	0	1	2.1993244e-003	2.4727833e-002
03/17/2002 11:31	7	82	1	0	0	0	0	0	0	0	2	1.2612654e-002	4.7380056e-002
03/17/2002 14:31	3	82	0	0	0	0	0	0	0	0	0	4.5446564e-003	2.5944552e-002
03/17/2002 17:31	3	3	0	0	0	0	0	0	0	0	0	4.2192437e-003	2.8633944e-002
03/17/2002 20:31	3	82	0	0	0	0	0	0	0	0	0	2.2181297e-003	2.3482525e-002
03/17/2002 23:31	3	82	0	0	0	0	0	0	0	0	0	3.0992714e-003	2.1124900e-002
03/18/2002 02:31	5	3	0	0	0	0	0	0	0	0	1	5.7980077e-003	3.1278152e-002
03/18/2002 05:31	4	3	0	0	0	0	0	0	0	0	1	8.6168770e-003	4.1090101e-002
03/18/2002 08:31	4	4	0	0	0	0	0	0	0	0	1	8.7385456e-003	3.9865327e-002
03/18/2002 11:31	6	2	0	0	0	0	0	0	0	0	2	4.4544928e-003	2.9356589e-002
03/18/2002 14:31	9	2	0	0	0	0	0	0	0	0	5	2.2732127e-003	2.5833924e-002
03/18/2002 17:31	7	2	0	0	0	0	0	0	0	0	2	2.0692400e-003	2.8265156e-002
03/18/2002 20:31	10	2	0	0	0	0	0	0	0	0	3	1.7104661e-003	2.9306231e-002
03/18/2002 23:31	11	2	0	0	0	0	0	0	0	0	8	2.2413015e-003	2.6770078e-002

03/19/2002 02:31	15	3	0	0	0	0	0	0	0	0	13	7.5741618e-003	4.6347076e-002	
03/19/2002 05:31	14	4	0	0	0	0	0	0	0	4	6	2.4779155e-002	1.1676876e-001	
03/19/2002 08:31	22	3	0	0	0	0	0	0	0	5	21	4.2382216e-002	2.0866158e-001	
03/19/2002 11:31	28	3	0	0	0	0	0	0	0	7	40	3.0869179e-002	1.5085040e-001	
03/19/2002 14:31	22	2	0	0	0	0	0	0	0	7	22	2.3534691e-002	1.1301009e-001	
03/19/2002 17:31	9	4	0	0	0	0	0	0	0	1	3	1.7225489e-002	7.8798618e-002	
03/19/2002 20:31	4	82	0	0	0	0	0	0	0	0	1	1.1337609e-002	4.6805279e-002	
03/19/2002 23:31	8	2	0	0	0	0	0	0	0	0	4	5.3619098e-003	3.5544660e-002	
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03/20/2002 05:31	3	2	0	0	0	0	0	0	0	0	0	3.1122280e-003	2.3264713e-002	
03/20/2002 08:31	3	2	0	0	0	0	0	0	0	0	0	3.3067679e-003	2.5843784e-002	
03/20/2002 11:31	3	2	0	0	0	0	0	0	0	0	1	2.3659987e-003	2.2228497e-002	
03/20/2002 14:31	4	3	0	0	0	0	0	0	0	0	1	2.1870342e-003	2.1301395e-002	
03/20/2002 17:31	4	2	0	0	0	0	0	0	0	0	1	3.5348305e-003	2.6727433e-002	
03/20/2002 20:31	2	2	0	0	0	0	0	0	0	0	0	1.9635603e-003	2.1366908e-002	
03/20/2002 23:31	9	3	0	0	0	0	0	0	0	0	5	6.0413964e-003	3.8698271e-002	
03/21/2002 02:31	16	3	0	0	0	0	0	0	0	0	15	1.1140498e-002	5.7139651e-002	
03/21/2002 05:31	14	2	0	0	0	0	0	0	0	1	12	1.1215994e-002	6.2505028e-002	
03/21/2002 08:31	17	2	0	0	0	0	0	0	0	1	14	1.6049169e-002	9.0555243e-002	
03/21/2002 11:31	45	3	0	0	0	0	0	0	0	14	102	6.4865609e-002	3.5569718e-001	
03/21/2002 14:31	32	3	0	0	0	0	0	0	0	11	51	4.0425322e-002	1.9510203e-001	
03/21/2002 17:31	18	4	0	0	0	0	0	0	0	5	16	2.5466704e-002	1.1944402e-001	
03/21/2002 20:31	6	5	0	0	0	0	0	0	0	1	1	2.1375870e-002	7.8232761e-002	
03/21/2002 23:31	5	4	0	0	0	0	0	0	0	1	1	1.3051236e-002	5.2432192e-002	
03/22/2002 02:31	9	3	0	0	0	0	0	0	0	1	4	1.0275387e-002	5.1051537e-002	
03/22/2002 05:31	10	3	0	0	0	0	0	0	0	0	6	1.2665621e-002	6.1997395e-002	
03/22/2002 08:31	13	3	0	0	0	0	0	0	0	0	10	1.8587630e-002	9.8428779e-002	
03/22/2002 11:31	11	3	0	0	0	0	0	0	0	0	7	1.4476386e-002	7.4621368e-002	
03/22/2002 14:31	25	3	0	0	0	0	0	0	0	0	39	2.4164874e-002	1.2222567e-001	
03/22/2002 17:31	15	2	0	0	0	0	0	0	0	0	14	3.8873862e-003	3.5568850e-002	
03/22/2002 20:31	95	2	0	0	0	0	0	0	0	131	219	1.0398783e-001	6.9453339e-001	
03/22/2002 23:31	35	4	0	0	0	0	0	0	0	26	34	9.7080100e-002	5.1142574e-001	
03/23/2002 02:31	22	2	0	0	0	0	0	0	0	1	11	18	3.4624631e-002	1.6770659e-001
03/23/2002 05:31	23	4	1	0	0	0	0	0	0	0	19	12	6.6903443e-002	2.9865174e-001

03/23/2002 08:31	27	4	0	0	0	0	0	0	0	12	24	3.7683953e-002	2.0793118e-001
03/23/2002 11:31	38	4	1	0	0	0	0	0	0	25	49	1.0945578e-001	6.2899088e-001
03/23/2002 14:31	60	4	0	0	0	0	0	0	3	94	90	1.6459459e-001	1.0229651e+000
03/23/2002 17:31	66	4	0	0	0	0	0	0	2	96	176	1.2923184e-001	7.7104965e-001
03/23/2002 20:31	70	4	0	0	0	0	0	0	3	113	142	1.9433474e-001	1.3079083e+000
03/23/2002 23:31	79	4	0	0	0	0	0	0	1	167	177	2.4066204e-001	1.7484742e+000
03/24/2002 02:31	71	5	0	0	0	0	0	0	6	113	167	1.9787700e-001	1.3204499e+000
03/24/2002 05:31	86	4	0	0	0	0	0	0	4	199	261	1.8801753e-001	1.2450896e+000
03/24/2002 08:31	111	5	1	0	0	0	0	0	9	334	292	3.1766670e-001	2.5301410e+000
03/24/2002 11:31	112	5	1	0	1	0	0	0	3	324	267	3.3857667e-001	2.9171341e+000
03/24/2002 14:31	93	4	0	0	0	0	0	0	3	239	242	2.7170122e-001	2.0844718e+000
03/24/2002 17:31	83	4	0	0	0	0	0	0	2	168	201	1.8189789e-001	1.2059265e+000
03/24/2002 20:31	97	4	0	0	0	0	0	0	1	233	285	2.3144067e-001	1.7154464e+000
03/24/2002 23:31	95	4	0	0	0	0	0	0	1	224	214	2.6467783e-001	2.0687056e+000
03/25/2002 02:31	84	2	0	0	0	0	0	0	0	149	180	1.9134110e-001	1.3535910e+000
03/25/2002 05:31	36	4	0	0	0	0	0	0	0	31	48	8.2445796e-002	4.1540893e-001
03/25/2002 08:31	20	3	0	0	0	0	0	0	0	2	21	2.8844328e-002	1.3815961e-001
03/25/2002 11:31	29	2	0	0	0	0	0	0	0	0	39	1.1644640e-002	8.0496902e-002
03/25/2002 14:31	18	3	0	0	0	0	0	0	0	0	16	1.3984483e-002	8.3960768e-002
03/25/2002 17:31	69	4	0	0	0	0	0	0	0	55	239	1.2273920e-001	7.4617516e-001
03/25/2002 20:31	43	3	0	0	0	0	0	0	0	11	107	5.3425672e-002	2.7694275e-001
03/25/2002 23:31	17	3	0	0	0	0	0	0	0	0	18	1.5257611e-002	8.6466593e-002
03/26/2002 02:31	6	3	0	0	0	0	0	0	0	0	2	3.6096495e-003	3.1816087e-002
03/26/2002 05:31	2	2	0	0	0	0	0	0	0	0	0	9.1715444e-004	1.8032930e-002
03/26/2002 08:31	4	3	0	0	0	0	0	0	0	0	1	5.6852646e-003	2.8754562e-002
03/26/2002 11:31	4	4	0	0	0	0	0	0	0	0	1	6.4687206e-003	3.6010106e-002
03/26/2002 14:31	4	2	0	0	0	0	0	0	0	0	1	3.8731526e-003	3.2874945e-002
03/26/2002 17:31	7	2	0	0	0	0	0	0	0	0	3	4.2165002e-003	3.2401868e-002
03/26/2002 20:31	9	2	0	0	0	0	0	0	0	0	5	1.8492223e-003	2.4063375e-002
03/26/2002 23:31	9	3	0	0	0	0	0	0	0	0	4	4.9062078e-003	3.6653142e-002
03/27/2002 02:31	6	82	1	0	0	0	0	0	0	0	1	1.0838811e-002	5.2438049e-002
03/27/2002 05:31	14	3	0	0	0	0	0	0	0	0	10	9.3008876e-003	5.4949462e-002
03/27/2002 08:31	13	4	1	0	0	0	0	0	0	1	9	1.2815408e-002	6.1299188e-002
03/27/2002 11:31	19	5	1	0	0	0	0	0	1	8	11	4.5181755e-002	1.9085551e-001

03/27/2002 14:31	13	4	0	0	0	0	0	0	0	1	3	5	3.2312478e-002	1.4740498e-001
03/27/2002 17:31	53	2	0	0	0	0	0	0	0	1	44	98	8.8063413e-002	4.9319590e-001
03/27/2002 20:31	18	4	0	0	0	0	0	0	0	5	15	2.3244919e-002	1.0297439e-001	
03/27/2002 23:31	8	82	1	0	0	0	0	0	0	1	2	2.7391799e-002	9.3027255e-002	
03/28/2002 02:31	23	3	2	0	0	0	0	0	0	0	29	4.4061763e-002	2.2516673e-001	
03/28/2002 05:31	6	3	0	0	0	0	0	0	0	0	2	7.1539084e-003	4.0831102e-002	
03/28/2002 08:31	4	82	0	0	0	0	0	0	0	0	1	4.2890975e-003	2.4940825e-002	
03/28/2002 11:31	3	3	0	0	0	0	0	0	0	0	1	4.8119549e-003	2.6475834e-002	
03/28/2002 14:31	5	3	0	0	0	0	0	0	0	0	1	3.3423061e-003	3.1514600e-002	
03/28/2002 17:31	6	3	0	0	0	0	0	0	0	0	2	6.5569483e-003	4.1487033e-002	
03/28/2002 20:31	4	2	0	0	0	0	0	0	0	0	1	3.0852170e-003	2.2971671e-002	
03/28/2002 23:31	7	2	0	0	0	0	0	0	0	0	3	8.8817678e-003	4.4461684e-002	
03/29/2002 02:31	6	3	0	0	0	0	0	0	0	0	2	1.3254075e-002	6.4024111e-002	
03/29/2002 05:31	7	2	0	0	0	0	0	0	0	0	1	1.6209424e-003	2.9601159e-002	
03/29/2002 08:31	9	3	0	0	0	0	0	0	0	0	5	5.3813888e-003	3.5968498e-002	
03/29/2002 11:31	39	2	0	0	0	0	0	0	0	0	92	2.2303658e-002	1.2023891e-001	
03/29/2002 14:31	46	3	0	0	0	0	0	0	0	0	123	6.1395883e-002	3.5368744e-001	
03/29/2002 17:31	23	3	0	0	0	0	0	0	0	0	25	1.8562234e-002	1.1138400e-001	
03/29/2002 20:31	8	2	0	0	0	0	0	0	0	0	4	2.6341364e-003	2.6638019e-002	
03/29/2002 23:31	31	3	0	0	0	0	0	0	0	0	60	2.1413304e-002	1.0696468e-001	
03/30/2002 02:31	16	2	0	0	0	0	0	0	0	0	15	1.3267508e-002	7.7442181e-002	
03/30/2002 05:31	6	2	0	0	0	0	0	0	0	0	1	2.0236807e-003	3.1522285e-002	
03/30/2002 08:31	4	2	0	0	0	0	0	0	0	0	1	1.1623098e-003	2.1330521e-002	
03/30/2002 11:31	7	2	0	0	0	0	0	0	0	0	3	2.0336327e-003	2.2850089e-002	
03/30/2002 14:31	6	3	0	0	0	0	0	0	0	0	2	3.2788330e-003	2.8634954e-002	
03/30/2002 17:31	43	3	0	0	0	0	0	0	0	0	102	9.6149365e-002	5.8008990e-001	
03/30/2002 20:31	35	4	0	0	0	0	0	0	0	0	5	68	6.0724894e-002	3.1103538e-001
03/30/2002 23:31	35	3	0	0	0	0	0	0	0	0	0	75	2.5718445e-002	1.2589390e-001
03/31/2002 02:31	65	2	0	0	0	0	0	0	0	0	83	104	9.4724342e-002	5.6313170e-001
03/31/2002 05:31	103	4	1	0	0	0	0	0	0	1	314	169	3.2534582e-001	2.7493376e+000
03/31/2002 08:31	81	5	0	0	0	0	0	0	0	1	262	123	2.9031108e-001	2.0732977e+000
03/31/2002 11:31	35	4	0	0	0	0	0	0	0	0	20	59	4.8612986e-002	2.3273414e-001
03/31/2002 14:31	14	3	0	0	0	0	0	0	0	0	0	12	1.3463537e-002	7.1782255e-002
03/31/2002 17:31	7	3	0	0	0	0	0	0	0	0	2	5.1563428e-003	4.1653298e-002	

03/31/2002 20:31	3	2	0	0	0	0	0	0	0	0	0	1.6708486e-003	2.2938512e-002
03/31/2002 23:31	2	2	0	0	0	0	0	0	0	0	0	2.4045972e-003	1.8593594e-002
04/01/2002 02:31	3	82	0	0	0	0	0	0	0	0	0	3.2400545e-003	2.1174386e-002
04/01/2002 05:31	2	82	0	0	0	0	0	0	0	0	0	5.0993218e-003	2.6954335e-002
04/01/2002 08:31	2	2	0	0	0	0	0	0	0	0	0	9.6952505e-004	2.2135012e-002
04/01/2002 11:31	4	2	0	0	0	0	0	0	0	1	1.2094071e-003	1.9599608e-002	
04/01/2002 14:31	5	2	0	0	0	0	0	0	0	2	2.9201128e-003	2.5088751e-002	
04/01/2002 17:31	3	3	0	0	0	0	0	0	0	1	2.6970020e-003	2.6154337e-002	
04/01/2002 20:31	3	82	0	0	0	0	0	0	0	0	0	2.7767953e-003	2.3903990e-002
04/01/2002 23:31	7	2	0	0	0	0	0	0	0	3	1.2585381e-003	2.2405743e-002	
04/02/2002 02:31	9	3	0	0	0	0	0	0	0	5	3.6459330e-003	2.8818160e-002	
04/02/2002 05:31	2	82	0	0	0	0	0	0	0	0	0	1.5883137e-003	2.0854947e-002
04/02/2002 08:31	2	2	0	0	0	0	0	0	0	0	0	2.5217300e-003	2.3878580e-002
04/02/2002 11:31	26	3	0	0	0	0	0	0	0	36	1.4476067e-002	8.4096510e-002	
04/02/2002 14:31	65	2	0	0	0	0	0	0	0	49	218	4.1124582e-002	2.2571093e-001
04/02/2002 17:31	41	4	0	0	0	0	0	0	0	26	64	9.0921416e-002	5.1731727e-001
04/02/2002 20:31	24	4	0	0	0	0	0	0	0	5	28	5.9179652e-002	3.0544962e-001
04/02/2002 23:31	24	3	0	0	0	0	0	0	0	4	31	3.9708309e-002	1.9311843e-001
04/03/2002 02:31	30	3	0	0	0	0	0	0	0	2	55	2.6618647e-002	1.3051047e-001
04/03/2002 05:31	34	4	0	0	0	0	0	0	0	11	50	6.7111037e-002	3.5293111e-001
04/03/2002 08:31	18	3	0	0	0	0	0	0	0	0	18	3.3594366e-002	1.7658150e-001
04/03/2002 11:31	28	3	0	0	0	0	0	0	0	0	41	1.8821940e-002	1.0902599e-001
04/03/2002 14:31	16	3	0	0	0	0	0	0	0	0	17	9.1246604e-003	5.3646850e-002
04/03/2002 17:31	25	3	0	0	0	0	0	0	0	1	35	2.0460144e-002	1.1104243e-001
04/03/2002 20:31	32	3	0	0	0	0	0	0	0	0	60	5.3745174e-002	2.9932745e-001

OFFSHORE STATION

surface wave processing summary:

file = boff0404.wb

temperature = 6.000

salinity = 27.000

density = 1021.238

number of points per wave burst = 2048

sample period = 0.50 sec

burst # 0:

mean pressure = 29.281 psia

instrument depth = 10.039 meters

total water depth = 11.039 meters

auto-spectrum:

24 spectral estimates per band

15 bands calculated

each band is 0.023 Hz wide

frequency span = 0.012 to 0.340 Hz

MM/DD/YYYY HH:MM	SIG.HT	SIG.PER	ENERGY (CM.SQ.)										btm shear (N/m ²)		
			(CM)	(SEC)	22+	20	17	15	13	11	9	7	5	3	
02/20/2002 14:33	15	3	0	0	0	0	0	0	0	0	0	5	10	4.6474305e-003	2.4547701e-002
02/20/2002 17:33	7	3	0	0	0	0	0	0	0	0	0	0	3	9.2462342e-004	1.3921418e-002
02/20/2002 20:33	4	3	0	0	0	0	0	0	0	0	0	0	1	8.3725442e-004	1.3702626e-002
02/20/2002 23:33	12	3	0	0	0	0	0	0	0	0	0	0	9	1.9593460e-003	1.8282793e-002
02/21/2002 02:33	7	3	0	0	0	0	0	0	0	0	0	0	3	1.3129423e-003	1.4083275e-002
02/21/2002 05:33	4	3	0	0	0	0	0	0	0	0	0	0	1	4.8822996e-004	1.4294204e-002
02/21/2002 08:33	4	3	0	0	0	0	0	0	0	0	0	0	1	4.2748236e-004	1.5136294e-002
02/21/2002 11:33	3	3	0	0	0	0	0	0	0	0	0	0	1	5.3132372e-004	1.6325985e-002

02/21/2002 14:33	18	3	0	0	0	0	0	0	0	0	21	1.9958691e-003	1.8386874e-002	
02/21/2002 17:33	4	3	0	0	0	0	0	0	0	0	1	1.0495530e-003	1.3023544e-002	
02/21/2002 20:33	54	3	0	0	0	0	0	0	0	0	2	181	1.8529855e-002	8.3444686e-002
02/21/2002 23:33	102	4	0	0	0	0	0	0	0	0	364	288	9.6311772e-002	4.7944589e-001
02/22/2002 02:33	70	4	0	0	0	0	0	0	0	0	140	163	5.7902799e-002	2.5324547e-001
02/22/2002 05:33	31	3	0	0	0	0	0	0	0	0	2	59	7.0562801e-003	3.5478355e-002
02/22/2002 08:33	14	3	0	0	0	0	0	0	0	0	0	12	1.8130779e-003	1.8402554e-002
02/22/2002 11:33	5	3	0	0	0	0	0	0	0	0	0	1	1.1339761e-003	1.4665410e-002
02/22/2002 14:33	6	3	0	0	0	0	0	0	0	0	0	2	1.2800306e-003	1.4809602e-002
02/22/2002 17:33	5	4	0	0	0	0	0	0	0	0	1	0	5.3805647e-003	2.1392260e-002
02/22/2002 20:33	31	3	0	0	0	0	0	0	0	0	1	60	4.2985829e-003	2.7800658e-002
02/22/2002 23:33	11	3	0	0	0	0	0	0	0	0	0	7	2.8512119e-003	2.0628656e-002
02/23/2002 02:33	5	3	0	0	0	0	0	0	0	0	0	1	8.4117781e-004	1.3156673e-002
02/23/2002 05:33	13	3	0	0	0	0	0	0	0	0	0	11	2.0127296e-003	1.8038442e-002
02/23/2002 08:33	58	3	0	0	0	0	0	0	0	0	1	212	9.0931303e-003	4.6944308e-002
02/23/2002 11:33	29	3	0	0	0	0	0	0	0	0	1	50	7.2878349e-003	3.9349530e-002
02/23/2002 14:33	19	3	0	0	0	0	0	0	0	0	1	22	5.6782701e-003	3.0842865e-002
02/23/2002 17:33	34	3	0	0	0	0	0	0	0	0	2	70	8.1720610e-003	3.9688262e-002
02/23/2002 20:33	25	3	0	0	0	0	0	0	0	0	1	36	4.8998782e-003	2.8556898e-002
02/23/2002 23:33	12	3	0	0	0	0	0	0	0	0	0	8	2.4510560e-003	2.0165551e-002
02/24/2002 02:33	5	3	0	0	0	0	0	0	0	0	0	1	7.6319749e-004	1.4635779e-002
02/24/2002 05:33	6	3	0	0	0	0	0	0	0	0	0	2	1.2606433e-003	1.3694051e-002
02/24/2002 08:33	11	3	0	0	0	0	0	0	0	0	0	7	1.9574143e-003	1.6493741e-002
02/24/2002 11:33	5	3	0	0	0	0	0	0	0	0	0	1	1.0395142e-003	1.4258271e-002
02/24/2002 14:33	6	3	0	0	0	0	0	0	0	0	0	2	1.2473554e-003	1.5603760e-002
02/24/2002 17:33	14	3	0	0	0	0	0	0	0	0	0	11	2.0158779e-003	1.7700502e-002
02/24/2002 20:33	6	3	0	0	0	0	0	0	0	0	0	2	9.0353579e-004	1.4450513e-002
02/24/2002 23:33	2	3	0	0	0	0	0	0	0	0	0	0	3.9893265e-004	1.4111786e-002
02/25/2002 02:33	3	3	0	0	0	0	0	0	0	0	0	1	4.8875461e-004	1.6028151e-002
02/25/2002 05:33	3	3	0	0	0	0	0	0	0	0	0	1	6.2397752e-004	1.3092547e-002
02/25/2002 08:33	5	3	0	0	0	0	0	0	0	0	0	1	5.0317796e-004	1.3585918e-002
02/25/2002 11:33	11	3	0	0	0	0	0	0	0	0	1	7	3.6310722e-003	2.1449419e-002
02/25/2002 14:33	17	3	0	0	0	0	0	0	0	0	1	17	4.0371764e-003	2.5825798e-002
02/25/2002 17:33	10	3	0	0	0	0	0	0	0	0	0	6	1.3510019e-003	1.5815915e-002

02/25/2002 20:33	4	0	0	0	0	0	0	0	0	2	2.0976288e-003	1.5036173e-002		
02/25/2002 23:33	4	3	0	0	0	0	0	0	0	1	8.5437972e-004	1.3715506e-002		
02/26/2002 02:33	6	3	0	0	0	0	0	0	0	2	9.5644094e-004	1.5194793e-002		
02/26/2002 05:33	4	3	0	0	0	0	0	0	0	1	8.2117345e-004	1.3147046e-002		
02/26/2002 08:33	6	3	0	0	0	0	0	0	0	1	1.7158993e-003	1.3686973e-002		
02/26/2002 11:33	5	3	0	0	0	0	0	0	0	2	9.7288256e-004	1.4490766e-002		
02/26/2002 14:33	8	4	0	0	0	0	0	0	0	2	5.0754277e-003	2.6228463e-002		
02/26/2002 17:33	29	3	0	0	0	0	0	0	0	53	4.7308017e-003	3.0415813e-002		
02/26/2002 20:33	20	3	0	0	0	0	0	0	0	24	2.6641773e-003	2.0364081e-002		
02/26/2002 23:33	18	3	0	0	0	0	0	0	0	19	1.6420239e-003	1.7146122e-002		
02/27/2002 02:33	22	3	0	0	0	0	0	0	0	30	4.3598427e-003	2.8129105e-002		
02/27/2002 05:33	5	3	0	0	0	0	0	0	0	1	6.8605818e-004	1.5229157e-002		
02/27/2002 08:33	6	3	0	0	0	0	0	0	0	2	2.1337222e-003	1.4958986e-002		
02/27/2002 11:33	3	3	0	0	0	0	0	0	0	0	7.1447586e-004	1.2758251e-002		
02/27/2002 14:33	31	3	0	0	0	0	0	0	0	59	5.8715019e-003	3.4778987e-002		
02/27/2002 17:33	75	4	0	0	0	0	0	0	0	96	258	4.7086571e-002	2.1660652e-001	
02/27/2002 20:33	69	4	0	0	0	0	0	0	0	184	113	5.7127781e-002	2.4699976e-001	
02/27/2002 23:33	110	4	0	0	0	0	0	0	0	367	393	8.0666327e-002	3.8530687e-001	
02/28/2002 02:31	45	4	0	0	0	0	0	0	0	15	112	3.1124774e-002	1.3348884e-001	
02/28/2002 05:33	17	4	0	0	0	0	0	0	0	3	15	8.5105541e-003	3.9573401e-002	
02/28/2002 08:33	8	3	0	0	0	0	0	0	0	1	3	2.7371864e-003	1.7709077e-002	
02/28/2002 11:33	36	3	0	0	0	0	0	0	0	1	82	4.4829668e-003	2.7330112e-002	
02/28/2002 14:33	26	3	0	0	0	0	0	0	0	1	41	5.9756855e-003	3.3889412e-002	
02/28/2002 17:33	37	4	0	0	0	0	0	0	0	12	73	1.6931990e-002	7.7590790e-002	
02/28/2002 20:33	25	4	0	0	0	0	0	0	0	1	21	17	2.4386989e-002	9.1285597e-002
02/28/2002 23:33	117	3	1	0	0	0	0	0	0	8	401	448	7.3130352e-002	3.4488283e-001
03/01/2002 02:33	115	3	1	0	0	0	0	0	0	9	357	454	1.1032684e-001	5.9248895e-001
03/01/2002 05:33	96	5	1	0	0	0	0	0	0	6	345	225	1.4915215e-001	8.6765423e-001
03/01/2002 08:33	74	5	0	0	0	0	0	0	0	7	231	103	1.2381738e-001	6.0881744e-001
03/01/2002 11:33	78	4	0	0	0	0	0	0	0	3	183	191	5.7832838e-002	2.5748890e-001
03/01/2002 14:33	66	3	0	0	0	0	0	0	0	0	64	210	2.9100090e-002	1.3127311e-001
03/01/2002 17:33	30	3	0	0	0	0	0	0	0	0	8	47	1.2667118e-002	6.0768236e-002
03/01/2002 20:33	17	3	0	0	0	0	0	0	0	2	15	8.7181327e-003	3.9220014e-002	
03/01/2002 23:33	14	3	0	0	0	0	0	0	0	0	11	2.1161043e-003	1.7001790e-002	

03/02/2002 02:33	6	3	0	0	0	0	0	0	0	0	2	6.8987346e-004	1.4596895e-002	
03/02/2002 05:33	8	3	0	0	0	0	0	0	0	0	4	1.1330922e-003	1.7736387e-002	
03/02/2002 08:33	40	4	0	0	0	0	0	0	0	25	73	2.6487226e-002	1.0946260e-001	
03/02/2002 11:33	56	4	0	0	0	0	0	0	0	34	160	2.1611111e-002	9.0891885e-002	
03/02/2002 14:33	97	3	0	0	0	0	0	0	0	67	522	3.5718555e-002	1.6226670e-001	
03/02/2002 17:33	71	3	0	0	0	0	0	0	0	18	300	3.7258356e-002	1.7342737e-001	
03/02/2002 20:33	45	3	0	0	0	0	0	0	0	6	122	1.8479039e-002	8.2541014e-002	
03/02/2002 23:33	16	3	0	0	0	0	0	0	0	0	16	2.1879315e-003	1.7782369e-002	
03/03/2002 02:33	5	3	0	0	0	0	0	0	0	0	1	7.5021331e-004	1.3632707e-002	
03/03/2002 05:33	4	82	0	0	0	0	0	0	0	0	0	9.8524063e-004	1.2830942e-002	
03/03/2002 08:33	8	3	0	0	0	0	0	0	0	0	4	6.0829217e-004	1.6360957e-002	
03/03/2002 11:33	5	3	0	0	0	0	0	0	0	0	1	1.1704086e-003	1.5119857e-002	
03/03/2002 14:33	59	3	0	0	0	0	0	0	0	19	197	2.3597506e-002	9.9199330e-002	
03/03/2002 17:33	58	4	0	0	0	0	0	0	0	106	102	5.5515967e-002	2.4802395e-001	
03/03/2002 20:33	64	3	0	0	0	0	0	0	0	3	252	1.6263892e-002	7.8392752e-002	
03/03/2002 23:33	74	4	0	0	0	0	0	0	0	21	321	2.3119251e-002	1.0180014e-001	
03/04/2002 02:33	72	4	0	0	0	0	0	0	1	220	99	5.5559674e-002	2.3448310e-001	
03/04/2002 05:33	136	5	1	0	0	0	0	0	12	896	252	2.1158099e-001	1.2840046e+000	
03/04/2002 08:33	112	4	0	0	0	0	0	0	1	527	261	1.5239683e-001	8.4913752e-001	
03/04/2002 11:33	32	4	0	0	0	0	0	0	0	17	46	1.7123041e-002	7.0371478e-002	
03/04/2002 14:33	15	3	0	0	0	0	0	0	0	2	13	3.5479579e-003	2.2019349e-002	
03/04/2002 17:33	15	3	0	0	0	0	0	0	0	1	5	9	6.9588328e-003	3.2980235e-002
03/04/2002 20:33	11	3	0	0	0	0	0	0	0	0	0	7	1.7495442e-003	1.8306747e-002
03/04/2002 23:33	17	3	0	0	0	0	0	0	0	0	0	18	4.6674272e-003	2.6333164e-002
03/05/2002 02:33	19	3	0	0	0	0	0	0	0	3	18	4.6523635e-003	2.4880280e-002	
03/05/2002 05:33	34	3	0	0	0	0	0	0	0	28	42	2.6070034e-002	1.0372518e-001	
03/05/2002 08:33	14	3	0	0	0	0	0	0	0	1	12	6.8362044e-003	3.4365161e-002	
03/05/2002 11:33	18	3	0	0	0	0	0	0	0	3	17	8.6235521e-003	3.9766656e-002	
03/05/2002 14:33	25	3	0	0	0	0	0	0	0	2	38	6.4458747e-003	3.2814663e-002	
03/05/2002 17:33	53	3	0	0	0	0	0	0	0	7	169	1.2731399e-002	6.0809161e-002	
03/05/2002 20:33	18	3	0	0	0	0	0	0	0	3	17	8.5808025e-003	4.0489889e-002	
03/05/2002 23:33	8	3	0	0	0	0	0	0	0	1	3	2.8794471e-003	1.9810243e-002	
03/06/2002 02:33	12	3	0	0	0	0	0	0	0	1	8	2.3571911e-003	1.8603390e-002	
03/06/2002 05:33	71	3	0	0	0	0	0	0	0	51	261	2.3210337e-002	1.0349951e-001	

03/06/2002 08:33	40	3	0	0	0	0	0	0	0	9	89	1.6183127e-002	7.3236996e-002
03/06/2002 11:33	23	4	0	0	0	0	0	0	0	2	31	9.0404869e-003	4.2782217e-002
03/06/2002 14:33	71	4	0	0	0	0	0	0	0	172	144	5.5297120e-002	2.4329653e-001
03/06/2002 17:33	84	4	0	0	0	0	0	0	0	113	328	3.5474948e-002	1.5726360e-001
03/06/2002 20:33	59	3	0	0	0	0	0	0	0	31	185	2.5860479e-002	1.1601056e-001
03/06/2002 23:33	39	4	0	0	0	0	0	0	0	23	73	1.9589960e-002	8.5866128e-002
03/07/2002 02:33	44	4	0	0	0	0	0	0	0	39	83	2.8190062e-002	1.1574454e-001
03/07/2002 05:33	96	3	0	0	0	0	0	0	0	62	509	3.1530689e-002	1.4186719e-001
03/07/2002 08:33	44	3	0	0	0	0	0	0	0	6	118	1.3229081e-002	6.2819259e-002
03/07/2002 11:33	11	3	0	0	0	0	0	0	0	0	8	3.2492021e-003	2.2288195e-002
03/07/2002 14:33	54	4	2	0	0	0	0	0	0	49	131	3.1033087e-002	1.3134995e-001
03/07/2002 17:33	70	4	0	0	0	0	0	0	0	86	218	3.1702638e-002	1.3693970e-001
03/07/2002 20:33	64	3	0	0	0	0	0	0	0	28	230	2.7684800e-002	1.2339484e-001
03/07/2002 23:33	57	4	0	0	0	0	0	0	0	41	162	4.1475478e-002	1.8614365e-001
03/08/2002 02:33	30	3	0	0	0	0	0	0	0	2	52	1.3339549e-002	5.8040574e-002
03/08/2002 05:33	15	3	0	0	0	0	0	0	0	0	13	2.5295020e-003	1.9235205e-002
03/08/2002 08:33	5	3	0	0	0	0	0	0	0	0	1	7.6271681e-004	1.4385432e-002
03/08/2002 11:33	4	3	0	0	0	0	0	0	0	0	1	1.0679903e-003	1.4329993e-002
03/08/2002 14:33	3	3	0	0	0	0	0	0	0	0	1	7.0189570e-004	1.4014814e-002
03/08/2002 17:33	4	4	0	0	0	0	0	0	0	1	1	2.8057890e-003	1.5342963e-002
03/08/2002 20:33	6	3	0	0	0	0	0	0	0	0	2	9.9828921e-004	1.3674828e-002
03/08/2002 23:33	4	3	0	0	0	0	0	0	0	0	1	5.9647619e-004	1.4911190e-002
03/09/2002 02:33	10	3	0	0	0	0	0	0	0	0	6	1.2686689e-003	1.6300850e-002
03/09/2002 05:33	15	3	0	0	0	0	0	0	0	1	13	2.5014116e-003	1.9229609e-002
03/09/2002 08:33	17	3	0	0	0	0	0	0	0	0	17	4.0417861e-003	2.3281534e-002
03/09/2002 11:33	16	3	0	0	0	0	0	0	0	1	16	3.6324332e-003	2.4209308e-002
03/09/2002 14:33	80	3	0	0	0	0	0	0	0	7	392	2.2367235e-002	1.0468331e-001
03/09/2002 17:33	45	3	0	0	0	0	0	0	0	3	126	5.8537196e-003	3.3700938e-002
03/09/2002 20:33	46	3	0	0	0	0	0	0	0	7	125	1.4878352e-002	6.4878699e-002
03/09/2002 23:33	23	3	0	0	0	0	0	0	0	5	28	1.2219788e-002	5.3187439e-002
03/10/2002 02:33	19	3	0	0	0	0	0	0	0	0	21	4.1416693e-003	2.6750916e-002
03/10/2002 05:33	9	3	0	0	0	0	0	0	0	1	4	1.6227668e-003	1.5690481e-002
03/10/2002 08:33	7	3	0	0	0	0	0	0	0	1	0	3.0284321e-003	1.7979219e-002
03/10/2002 11:33	9	3	0	0	0	0	0	0	0	0	5	1.2633559e-003	1.6149707e-002

03/10/2002 14:33	11	3	0	0	0	0	0	0	0	0	7	1.8556931e-003	1.8023884e-002
03/10/2002 17:33	30	3	0	0	0	0	0	0	0	0	54	4.7537111e-003	2.9060064e-002
03/10/2002 20:33	26	3	0	0	0	0	0	0	0	0	43	3.8601245e-003	2.5357054e-002
03/10/2002 23:33	111	4	0	0	0	0	0	0	0	366	407	8.5184247e-002	4.2127410e-001
03/11/2002 02:33	216	3	1	0	0	0	0	0	0	43	1593	1290	2.7083123e-001
03/11/2002 05:33	92	5	1	0	0	0	0	0	0	5	371	149	1.3333263e-001
03/11/2002 08:33	126	4	1	0	0	0	0	0	0	16	604	374	1.4466176e-001
03/11/2002 11:33	118	3	0	0	0	0	0	0	0	3	204	664	5.4873149e-002
03/11/2002 14:33	99	3	0	0	0	0	0	0	0	8	249	357	1.1894109e-001
03/11/2002 17:28	110	4	1	0	0	0	0	0	0	21	361	376	1.8304212e-001
03/11/2002 20:33	124	4	0	0	0	0	0	0	0	7	517	437	1.2398276e-001
03/11/2002 23:33	100	4	0	0	0	0	0	0	0	5	249	374	6.5876641e-002
03/12/2002 02:33	67	3	0	0	0	0	0	0	0	1	74	207	4.8086299e-002
03/12/2002 05:33	59	4	0	0	0	0	0	0	0	1	96	122	7.4436217e-002
03/12/2002 08:33	84	4	0	0	0	0	0	0	0	1	178	258	5.6685133e-002
03/12/2002 11:33	58	4	0	0	0	0	0	0	0	0	63	145	2.4874812e-002
03/12/2002 14:33	22	3	0	0	0	0	0	0	0	0	1	29	4.0890242e-003
03/12/2002 17:33	41	4	0	0	0	0	0	0	0	0	11	93	2.3315620e-002
03/12/2002 20:33	27	4	0	0	0	0	0	0	0	0	2	45	9.9011438e-003
03/12/2002 23:33	100	3	0	0	0	0	0	0	0	0	7	618	2.3949482e-002
03/13/2002 02:33	47	3	0	0	0	0	0	0	0	0	0	139	9.0007795e-003
03/13/2002 05:33	34	3	0	0	0	0	0	0	0	0	2	71	1.1597509e-002
03/13/2002 08:33	19	3	0	0	0	0	0	0	0	0	1	22	5.3397058e-003
03/13/2002 11:33	14	3	0	0	0	0	0	0	0	0	0	0	1.5028396e-003
03/13/2002 14:33	4	3	0	0	0	0	0	0	0	0	0	1	6.6178796e-004
03/13/2002 17:33	3	3	0	0	0	0	0	0	0	0	0	1	6.5939060e-004
03/13/2002 20:33	5	3	0	0	0	0	0	0	0	0	0	1	1.3515212e-003
03/13/2002 23:33	4	3	0	0	0	0	0	0	0	0	0	1	7.0436089e-004
03/14/2002 02:33	5	3	0	0	0	0	0	0	0	0	0	2	6.4040477e-004
03/14/2002 05:33	5	3	0	0	0	0	0	0	0	0	0	1	3.3897091e-004
03/14/2002 08:33	13	3	0	0	0	0	0	0	0	0	0	10	1.4693997e-003
03/14/2002 11:33	14	3	0	0	0	0	0	0	0	0	0	13	2.7946319e-003
03/14/2002 14:33	12	3	0	0	0	0	0	0	0	0	1	8	5.4935935e-003
03/14/2002 17:33	15	3	0	0	0	0	0	0	0	0	1	13	5.4885385e-003

03/14/2002 20:33	8	3	0	0	0	0	0	0	0	0	3	1.5705324e-003	1.5399451e-002	
03/14/2002 23:33	4	4	0	0	0	0	0	0	0	0	1	2.0199214e-003	1.3933086e-002	
03/15/2002 02:33	3	3	0	0	0	0	0	0	0	0	0	5.6757499e-004	1.3352048e-002	
03/15/2002 05:33	2	3	0	0	0	0	0	0	0	0	0	8.9551163e-004	1.2393624e-002	
03/15/2002 08:33	5	3	0	0	0	0	0	0	0	0	2	8.5512213e-004	1.3704380e-002	
03/15/2002 11:33	58	3	0	0	0	0	0	0	0	2	209	1.0003784e-002	4.8822548e-002	
03/15/2002 14:33	65	3	0	0	0	0	0	0	0	0	265	1.0313899e-002	5.3558182e-002	
03/15/2002 17:33	15	3	0	0	0	0	0	0	0	0	14	1.8130224e-003	1.9365770e-002	
03/15/2002 20:33	5	3	0	0	0	0	0	0	0	0	1	8.2826485e-004	1.4021272e-002	
03/15/2002 23:33	5	3	0	0	0	0	0	0	0	0	1	1.0036203e-003	1.3161089e-002	
03/16/2002 02:33	3	3	0	0	0	0	0	0	0	0	1	4.6754397e-004	1.4426195e-002	
03/16/2002 05:33	2	3	0	0	0	0	0	0	0	0	0	2.4302994e-003	1.2332253e-002	
03/16/2002 08:33	6	3	0	0	0	0	0	0	0	0	1	4.9575782e-003	2.1943551e-002	
03/16/2002 11:33	4	3	0	0	0	0	0	0	0	0	1	1.5526000e-003	1.3091999e-002	
03/16/2002 14:33	14	3	0	0	0	0	0	0	0	0	12	2.0489068e-003	1.8776583e-002	
03/16/2002 17:33	30	3	0	0	0	0	0	0	0	1	57	1.1310940e-002	5.3544121e-002	
03/16/2002 20:33	5	3	0	0	0	0	0	0	0	0	1	1.2236146e-003	1.3993380e-002	
03/16/2002 23:33	6	3	0	0	0	0	0	0	0	0	2	1.9075805e-003	1.3859804e-002	
03/17/2002 02:33	6	3	0	0	0	0	0	0	0	0	2	6.2939155e-004	1.3916169e-002	
03/17/2002 05:33	2	82	0	0	0	0	0	0	0	0	0	2.0446484e-003	1.2795040e-002	
03/17/2002 08:33	4	3	0	0	0	0	0	0	0	0	1	7.4088772e-004	1.4228517e-002	
03/17/2002 11:33	7	82	1	0	0	0	0	0	0	0	1	1	3.6658546e-003	1.9209198e-002
03/17/2002 14:33	5	3	0	0	0	0	0	0	0	0	1	9.8382814e-004	1.3012155e-002	
03/17/2002 17:33	6	3	0	0	0	0	0	0	0	0	2	6.8413972e-004	1.5169212e-002	
03/17/2002 20:33	5	3	0	0	0	0	0	0	0	0	1	1.6411937e-003	1.4980681e-002	
03/17/2002 23:33	6	3	0	0	0	0	0	0	0	0	2	1.2948596e-003	1.3794117e-002	
03/18/2002 02:33	11	4	0	0	0	0	0	0	0	0	1	7	3.9435734e-003	2.1709955e-002
03/18/2002 05:33	12	4	0	0	0	0	0	0	0	0	4	6	6.8386222e-003	3.1944124e-002
03/18/2002 08:33	23	3	0	0	0	0	0	0	0	0	2	31	7.5850045e-003	3.7005499e-002
03/18/2002 11:27	11	4	0	0	0	0	0	0	0	0	3	4	5.0090317e-003	2.4381900e-002
03/18/2002 14:33	6	3	0	0	0	0	0	0	0	0	1	2	1.3995473e-003	1.4306702e-002
03/18/2002 17:33	5	3	0	0	0	0	0	0	0	0	0	2	9.1293023e-004	1.4833807e-002
03/18/2002 20:33	6	3	0	0	0	0	0	0	0	0	0	2	8.5698126e-004	1.5899789e-002
03/18/2002 23:33	8	3	0	0	0	0	0	0	0	0	1	3	1.6121253e-003	1.6311133e-002

03/19/2002 02:33	36	3	0	0	0	0	0	0	0	3	77	1.1278521e-002	5.0814528e-002	
03/19/2002 05:33	77	4	0	0	0	0	0	0	0	208	166	7.6976519e-002	3.6324859e-001	
03/19/2002 08:33	105	3	0	0	0	0	0	0	1	152	531	4.3869523e-002	2.0961311e-001	
03/19/2002 11:33	112	3	0	0	0	0	0	0	1	289	497	5.3103462e-002	2.4603477e-001	
03/19/2002 14:33	79	4	0	0	0	0	0	0	1	188	197	5.2428835e-002	2.2727715e-001	
03/19/2002 17:33	49	4	0	0	0	0	0	0	1	98	54	4.9930146e-002	2.0858065e-001	
03/19/2002 20:33	30	3	0	0	0	0	0	0	1	6	49	1.2433809e-002	5.6175533e-002	
03/19/2002 23:33	15	3	0	0	0	0	0	0	0	4	10	5.6610708e-003	2.8515778e-002	
03/20/2002 02:33	9	3	0	0	0	0	0	0	0	1	3	3.8722822e-003	2.0324084e-002	
03/20/2002 05:33	6	3	0	0	0	0	0	0	0	0	2	2.5150345e-003	1.6802905e-002	
03/20/2002 08:33	8	3	0	0	0	0	0	0	0	0	3	3.5510272e-003	2.1823873e-002	
03/20/2002 11:33	9	3	0	0	0	0	0	0	0	1	4	2.5687267e-003	1.7336628e-002	
03/20/2002 14:33	7	3	0	0	0	0	0	0	0	1	1	4.1348793e-003	2.0546128e-002	
03/20/2002 17:33	5	3	0	0	0	0	0	0	0	0	1	9.8659058e-004	1.4333077e-002	
03/20/2002 20:33	5	3	0	0	0	0	0	0	0	0	1	1.7357940e-003	1.6473258e-002	
03/20/2002 23:33	37	3	0	0	0	0	0	0	0	1	85	4.4532597e-003	2.8069442e-002	
03/21/2002 02:33	35	3	0	0	0	0	0	0	0	5	71	8.5144941e-003	4.0349615e-002	
03/21/2002 05:33	43	4	0	0	0	0	0	0	0	13	100	1.8354737e-002	7.7676211e-002	
03/21/2002 08:33	53	3	0	0	0	0	0	0	0	9	168	1.9005816e-002	8.7355085e-002	
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03/22/2002 05:33	17	3	0	0	0	0	0	0	0	0	17	2.7448321e-003	2.0699735e-002	
03/22/2002 08:33	13	3	0	0	0	0	0	0	0	0	11	2.6454863e-003	2.0567655e-002	
03/22/2002 11:33	8	3	0	0	0	0	0	0	0	0	4	2.3331738e-003	1.8203061e-002	
03/22/2002 14:33	24	3	0	0	0	0	0	0	0	1	35	4.6503409e-003	2.6785235e-002	
03/22/2002 17:33	8	3	0	0	0	0	0	0	0	0	4	1.0784659e-003	1.4397317e-002	
03/22/2002 20:33	81	4	0	0	0	0	0	0	0	214	195	6.5464857e-002	3.0618021e-001	
03/22/2002 23:33	36	4	0	0	0	0	0	0	0	26	53	2.3533096e-002	9.6711589e-002	
03/23/2002 02:33	60	3	0	0	0	0	0	0	1	39	188	1.2891676e-002	6.0816422e-002	
03/23/2002 05:33	35	4	0	0	0	0	0	0	0	25	52	2.0078141e-002	8.2179096e-002	

03/23/2002 08:33	41	3	0	0	0	0	0	0	0	11	92	5.9202058e-003	3.6897040e-002
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03/23/2002 17:33	104	4	0	0	0	0	0	0	2	205	475	6.8922054e-002	3.2525652e-001
03/23/2002 20:33	85	3	0	0	0	0	0	0	1	143	304	5.3637175e-002	2.5119275e-001
03/23/2002 23:33	88	3	0	0	0	0	0	0	1	174	310	8.3047462e-002	4.0864693e-001
03/24/2002 02:33	90	4	0	0	0	0	0	0	5	248	253	9.5134431e-002	4.6413908e-001
03/24/2002 05:33	134	4	0	0	0	0	0	0	6	520	588	1.2073735e-001	6.3230418e-001
03/24/2002 08:33	149	4	0	0	0	0	0	0	6	616	765	1.0555057e-001	5.6904741e-001
03/24/2002 11:33	126	5	0	0	0	0	0	0	2	396	586	1.5187565e-001	8.8446359e-001
03/24/2002 14:33	97	4	0	0	0	0	0	0	3	330	256	1.2823512e-001	6.7322443e-001
03/24/2002 17:33	101	4	0	0	0	0	0	0	1	318	322	9.6998110e-002	4.7483214e-001
03/24/2002 20:33	117	4	0	0	0	0	0	0	1	408	442	9.9294066e-002	5.1055119e-001
03/24/2002 23:33	98	4	0	0	0	0	0	0	1	234	360	8.2791309e-002	4.1719004e-001
03/25/2002 02:33	86	4	0	0	0	0	0	0	0	246	212	8.9617865e-002	4.3713180e-001
03/25/2002 05:33	33	4	0	0	0	0	0	0	0	21	48	2.1043885e-002	8.3358898e-002
03/25/2002 08:33	28	3	0	0	0	0	0	0	0	2	46	7.0733558e-003	3.5708833e-002
03/25/2002 11:33	14	3	0	0	0	0	0	0	0	0	12	1.7823644e-003	1.8750728e-002
03/25/2002 14:33	10	3	0	0	0	0	0	0	0	0	6	1.2344707e-003	1.6563724e-002
03/25/2002 17:33	65	4	0	0	0	0	0	0	0	99	161	4.2624823e-002	1.8219118e-001
03/25/2002 20:33	54	3	0	0	0	0	0	0	0	8	171	1.1205563e-002	5.3564244e-002
03/25/2002 23:33	14	3	0	0	0	0	0	0	0	0	13	2.4361987e-003	2.0683707e-002
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03/26/2002 05:33	3	3	0	0	0	0	0	0	0	0	0	4.4309869e-004	1.3929050e-002
03/26/2002 08:33	11	3	0	0	0	0	0	0	0	0	7	2.2450371e-003	1.6679319e-002
03/26/2002 11:33	9	3	0	0	0	0	0	0	0	1	4	2.8223647e-003	1.9864793e-002
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03/26/2002 17:33	12	3	0	0	0	0	0	0	0	0	8	1.5445017e-003	1.6187662e-002
03/26/2002 20:33	8	3	0	0	0	0	0	0	0	1	3	2.1663265e-003	1.5491920e-002
03/26/2002 23:33	11	3	0	0	0	0	0	0	0	0	7	1.8918075e-003	1.7159287e-002
03/27/2002 02:33	30	3	0	0	0	0	0	0	0	1	56	7.8270349e-003	4.0770633e-002
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03/27/2002 14:33	95	4	0	0	0	0	0	0	20	184	362	9.3769391e-002	4.7032977e-001	
03/27/2002 17:33	138	4	0	0	0	0	0	0	2	244	944	6.4889219e-002	3.1848319e-001	
03/27/2002 20:33	76	3	1	0	0	0	0	0	1	146	216	4.1755663e-002	1.7643577e-001	
03/27/2002 23:33	17	4	0	0	0	0	0	0	0	12	6	2.9566466e-002	1.0305388e-001	
03/28/2002 02:33	18	3	1	0	0	0	0	0	0	1	19	6.1810779e-003	3.2897213e-002	
03/28/2002 05:33	6	3	0	0	0	0	0	0	0	0	2	9.9119750e-004	1.5382439e-002	
03/28/2002 08:33	7	4	0	0	0	0	0	0	0	1	1	5.0008533e-003	2.2134945e-002	
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03/28/2002 14:33	6	3	0	0	0	0	0	0	0	0	2	6.1575663e-004	1.5425848e-002	
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03/29/2002 02:33	7	3	0	0	0	0	0	0	0	0	3	2.1188103e-003	1.7254551e-002	
03/29/2002 05:33	5	3	0	0	0	0	0	0	0	0	1	1.2620581e-003	1.5142105e-002	
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03/29/2002 14:33	49	3	0	0	0	0	0	0	0	1	150	9.1225551e-003	4.9200407e-002	
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03/31/2002 17:33	4	3	0	0	0	0	0	0	0	0	1	1.1762838e-003	1.3961563e-002	

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04/02/2002 11:33	21	3	0	0	0	0	0	0	0	1	27	3.6042885e-003	2.3373972e-002
04/02/2002 14:33	95	3	0	0	0	0	0	0	0	93	469	3.7793280e-002	1.6964179e-001
04/02/2002 17:33	57	3	0	0	0	0	0	0	0	57	146	2.8899891e-002	1.3127342e-001
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04/03/2002 05:33	51	3	0	0	0	0	0	0	0	6	157	1.5312895e-002	7.0605749e-002
04/03/2002 08:33	15	3	0	0	0	0	0	0	0	0	14	5.2874564e-003	2.9781848e-002
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04/03/2002 17:33	31	3	0	0	0	0	0	0	0	0	58	4.4936534e-003	2.8786477e-002
04/03/2002 20:33	34	3	0	0	0	0	0	0	0	0	73	9.1967565e-003	4.6892435e-002
04/03/2002 23:33	62	3	0	0	0	0	0	0	0	4	234	1.4851714e-002	6.9931212e-002
04/04/2002 02:33	104	4	0	0	0	0	0	0	1	544	134	1.4274016e-001	7.3429684e-001
04/04/2002 05:33	103	4	0	0	0	0	0	0	1	350	307	1.2159881e-001	6.2647527e-001
04/04/2002 08:33	84	4	0	0	0	0	0	0	0	231	209	9.7274534e-002	4.8610777e-001
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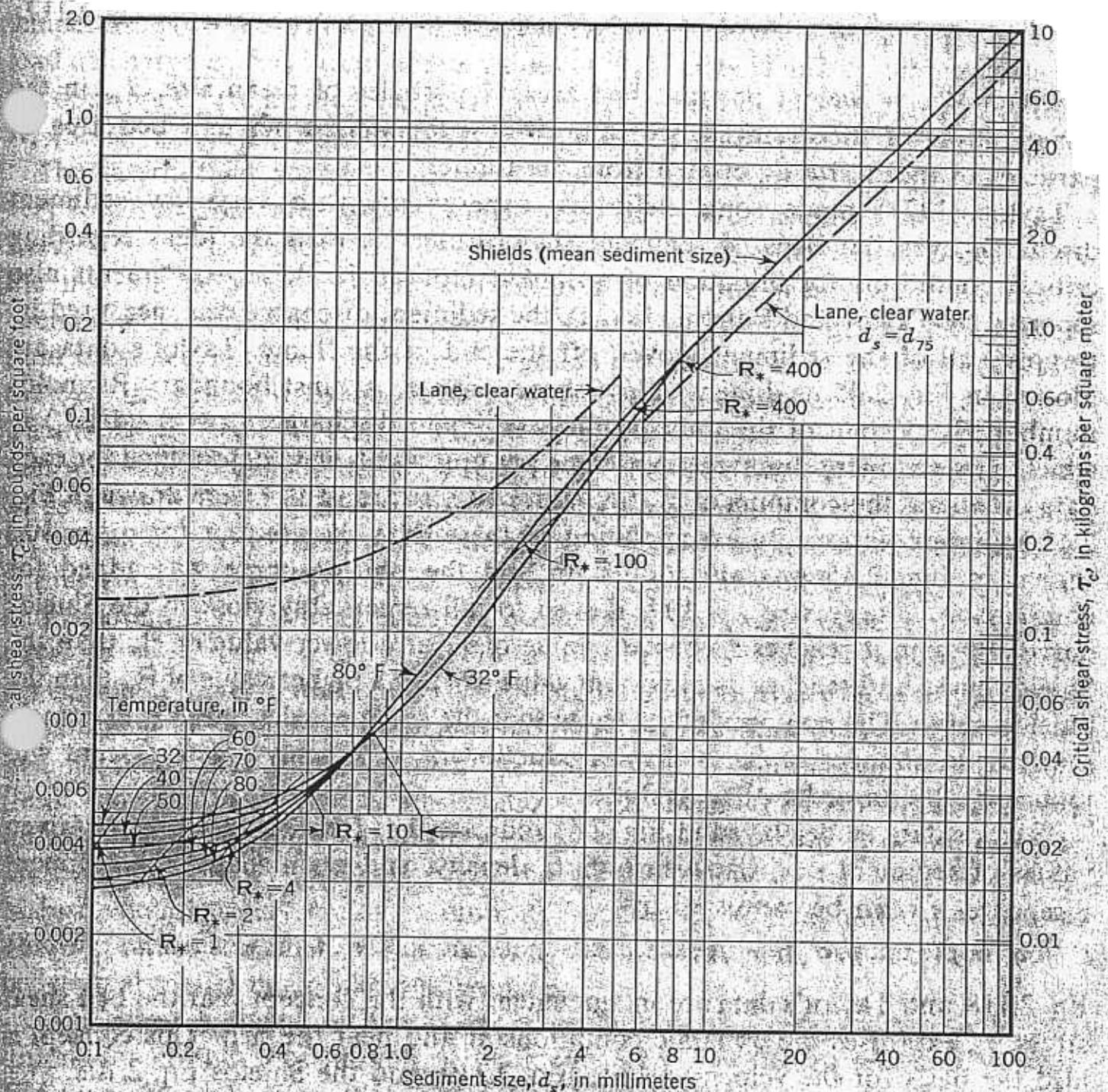


FIG. 2.44.—Critical Shear Stress for Quartz Sediment In Water as Function of Grain Size: Shields (1936) and Lane (1955)

