CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

CLAY LUMPS & FRIABLE PARTICLES
ASTM-C-142

Agency:	JICA Study Team, Peshwar.
Project.	MUNDA DAM
Ref:	JM-101 Dated:02/10/98
Location	River Swat
Sample No:	P-2
Material:	Aggregate River Bed
Lab. No:	15538

TEST ON FINE AGGREGATE.

Sieve Size	Grading of Original Sample %	Wts of Fraction of Material remaining on sieve # 200 after test C-117.	Designated Sieve for after test sieving.	Percent of Clay Lumps & Friable Particles.	Weighted Percentage
Minus # 100					
No. 50 to No. 100					
No. 30 to No. 50					
No. 16 to No. 30					
No. 08 to No. 16 (25gms)			#20		
N0. 04 to No. 08					

Total:

TEST ON COARSE AGGREGATE

Over 1-1/2 in. (5000 g)	34.5	5010.5	# 4-5004.1	0.13	0.04
1-1/2 in. to 3/4 in. (3000 g)	23.0	3023.2	# 4-3018.4	0.16	0.04
3/4 in. to 3/8 in. (2000 g)	10.3	2000.6	# 4-1997.3	0.16	0.02
3/8 in. to No.4 (1000 g)	4.3	1001.0	# 8-0997.8	0.32	0.01
Minus # 4	27.9	-	-	-	0.09

Total: 0.20

Tested by:- [signature] Checked by: [signature] Approvedby: [signature]
P.D.CMTL

CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

CLAY LUMPS & FRIABLE PARTICLES
ASTM-C-142

Agency: JICA Study Team, Peshwar.
Project: MUNDA DAM
Ref: JM-101 Dated:02/10/98
Location River Swat
Sample No: P-3
Material: Aggregate River Bed
Lab. No: 15538

TEST ON FINE AGGREGATE.

Sieve Size	Grading of Original Sample %	Wts of Fraction of Material remaining on sieve # 200 after test C-117.	Designated Sieve for after test sieving.	Percent of Clay Lumps & Friable Particles.	Weighted Percentage
Minus # 100					
No. 50 to No. 100					
No. 30 to No. 50					
No. 16 to No. 30					
No. 08 to No. 16 (25gms)			#20		
N0. 04 to No. 08					

Total:

TEST ON COARSE AGGREGATE

Over 1-1/2 in. (5000 g)	51.2	5045.4	# 4-5040.5	0.10	0.05
1-1/2 in. to 3/4 in. (3000 g)	12.9	3010.2	# 4-3006.4	0.13	0.02
3/4 in. to 3/8 in. (2000 g)	5.9	2003.6	# 4-1999.1	0.22	0.01
3/8 in. to No.4 (1000 g)	2.6	1000.0	# 8-996.3	0.37	0.01
Minus # 4	27.4	-	-	-	0.10

Total: 0.19

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P.D.CMTL

CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

CLAY LUMPS & FRIABLE PARTICLES
ASTM-C-142

Agency: JICA Study Team, Peshwar.
Project: MUNDA DAM
Ref: JM-101 Dated:02/10/98
Location River Swat
Sample No: P-5
Material: Aggregate River Bed
Lab. No: 15538

TEST ON FINE AGGREGATE.

Sieve Size	Grading of Original Sample %	Wts of Fraction of Material remaining on sieve # 200 after test C-117.	Designated Sieve for after test sieving.	Percent of Clay Lumps & Friable Particles.	Weighted Percentage
Minus # 100					
No. 50 to No. 100					
No. 30 to No. 50					
No. 16 to No. 30					
No. 08 to No. 16 (25gms)			#20		
N0. 04 to No. 08					

TEST ON COARSE AGGREGATE

Over 1-1/2 in. (5000 g)	54.0	5008.5	# 4 5002.8	0.11	0.06
1-1/2 in. to 3/4 in. (3000 g)	20.7	3015.2	# 4 3009.6	0.19	0.04
3/4 in. to 3/8 in. (2000 g)	8.1	2006.0	# 4. 2003.8	0.11	0.01
3/8 in. to No.4 (1000 g)	2.2	1001.2	# 8 996.3	0.49	0.01
Minus # 4	15.0	-	-	-	0.07

Total: 0.19

Tested by:- Checked by: Approvedby:
P.D.CMTL

CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

CLAY LUMPS & FRIABLE PARTICLES
ASTM-C-142

Agency:	JICA Study Team, Peshwar
Project:	MUNDA DAM
Ref:	JM-101 Dated.02/10/98
Location	River Swat
Sample No:	P-7
Material:	Aggregate River Bed
Lab. No:	15538

TEST ON FINE AGGREGATE.

Sieve Size	Grading of Original Sample %	Wts of Fraction of Material remaining on sieve # 200 after test C-117.	Designated Sieve for after test sieving.	Percent of Clay Lumps & Friable Particles.	Weighted Percentage
Minus # 100					
No. 50 to No. 100					
No. 30 to No. 50					
No. 16 to No. 30					
No. 08 to No. 16 (25gms)			#20		
N0. 04 to No. 08					

TEST ON COARSE AGGREGATE

Over 1-1?2 in. (5000 g)	51.2	5009.3	# 4 4932.5	1.53	0.78
1-1/2 in. to 3/4 in. (3000 g)	12.4	3003.6	# 4 2901.8	3.39	0.42
3/4 in. to 3/8 in. (2000 g)	8.0	2000	# 4 1814.8	9.26	0.74
3/8 in. to No.4 (1000 g)	4.4	1000	# 8 835.5	16.45	0.72
Minus # 4	24.0	-	-	-	3.95

Total: 6.61

Tested by:- [signature] Checked by: [signature] Approvedby: [signature]
P.D.CMTL

CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

SULPHATE SOUNDNESS TEST
ASTM C-88

Agency:	JICA Study Team,Peshwar
Project:	MUNDA DAM
Ref:	JM-101
Location	River Swat
Sample No:	P-1
Material:	Aggregate River Bed
Chemical:	Sodiun Sulphate
No.of Cycles:	5
Lab. No:	15538

SOUNDNESS TEST ON FINE AGGREGATE.

Sieve Size	Desig. Sieve after test	Grading of Original Sample %	Weight of test fraction before test (gm)	Weight of test fraction after test (gm)	Percent pessing designated sieve after test (gm)	Weighted Percentage Loss
Minus # 100						
No. 50 to No. 100						
No. 30 to No. 50	No.50					
No. 16 to No. 30	No.30					
No. 08 to No. 16	No.16					
N0. 04 to No. 08	No.08					
3/8 in. to No. 04						
					Total:	

SOUNDNESS TEST ON COARSE AGGREGATE

2-1/2 in to 2 in (2825g)		10.6	2842.8			
2-1/2 in to 1-1/2 in	1-1/4in			4771.0	0.1[illegible]	0.03
2 in to 1-1/2 in (1958g)		12.5	1935.0			
1-1/2 in to 1 in (1012g)		16.0	1017.1			
1-1/2 in to 3/4 in.	5/8 in			1526.5	0.31	0.08
1 in to 3/4 in (513g)		9.3	514.1			
3/4 in to 1/2 in (675g)		9.5	675.9			
3/4 in to 3/8 in.	5/16in			1003.8	0.55	0.07
1/2 in to 3/8 in (333g)		3.8	333.5			
3/8 in to # 4. (298g) - # 4	# 5	6.0	298.0	297.7	0.10	0.01
					TOTAL=	0.19

Tested by:- [signature] Checked by: [signature] Approved by: [signature]
P.D.CMTL

CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

SULPHATE SOUNDNESS TEST
ASTM C-88

Agency:	JICA Study Team,Peshwar
Project:	MUNDA DAM
Ref:	JM-101
Location	River Swat
Sample No:	P-3
Material:	Aggregate River Bed
Chemical:	Sodium Sulphate
No.of Cycles:	5
Lab. No:	15538

SOUNDNESS TEST ON FINE AGGREGATE.

Sieve Size	Desig. Sieve after test	Grading of Original Sample %	Weight of test fraction before test (gm)	Weight of test fraction after test (gm)	Percent pessing designateo sieve after test (gm)	Weighted Percentage Loss
Minus # 100						
No. 50 to No. 100						
No. 30 to No. 50	No.50					
No. 16 to No. 30	No.30					
No. 08 to No. 16	No.16					
N0. 04 to No. 08	No.08					
3/8 in to No. 04						
					Total.	

SOUNDNESS TEST ON COARSE AGGREGATE

2-1/2 in to 2 in (2825g)	2-1/2 in to 1-1/2 in	1-1/4in	10.3	2851.3	4794.9	0.13	0.03
2 in to 1-1/2 in (1958g)			11.0	1950.0			
1-1/2 in to 1 in (1012g)	1-1/2 in to 3/4 in.	5/8 in	12.1	1025.5	1538.2	0.14	0.02
1 in to 3/4 in (513g)			5.6	514.9			
3/4 in to 1/2 in (675g)	3/4 in to 3/8 in.	5/16in	5.8	676.6	989.3	2.03	0.16
1/2 in to 3/8 in (333g)			2.3	333.2			
3/8 in to # 4. (298g)		# 5	3.6	298.0	289.9	2.72	0.10
- # 4							
						TOTAL=	0.31

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P.D.CMTL

CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

SULPHATE SOUNDNESS TEST
ASTM C-88

Agency:	JICA Study Team,Peshwar
Project:	M..NDA DAM
Ref:	JM 191
Location	River Swat
Sample No:	P-5
Material:	Aggregate River Bed
Chemical:	Sodium Sulphate
No.of Cycles:	5
Lab. No:	15538

SOUNDNESS TEST ON FINE AGGREGATE.

Sieve Size	Desig Sieve after test	Grading of Original Sample %	Weight of test fraction before test (gm)	Weight of test fraction after test (gm)	Percent pessing designated sieve after test (gm)	Weighted Percentage Loss
Minus # 100						
No. 50 to No. 100						
No. 30 to No. 50	No.50					
No. 16 to No. 30	No.30					
No. 08 to No. 16	No.16					
N0. 04 to No. 08	No.08					
3/8 in. to No. 04						
					Total:	

SOUNDNESS TEST ON COARSE AGGREGATE

2-1/2 in to 2 in (2825g)	2-1/2 in to 1-1/2 in	1-1/4in	13.6	2820.1	4691.7	1.95	0.58
2 in to 1-1/2 in (1958g)			16.2	1964.9			
1-1/2 in to 1 in (1012g)	1-1/2 in to 3/4 in.	5/8 in	16.5	1013.7	1523.7	0.24	0.06
1 in to 3/4 in (513g)			7.9	513.7			
3/4 in to 1/2 in (675g)	3/4 in to 3/8 in.	5/16in	7.3	676.0	996.5	1.34	0.13
1/2 in to 3/8 in (333g)			2.2	334.0			
3/8 in to # 4. (298g) - # 4		# 5	2.6	298.0	297.8	0.07	0.00
						TOTAL:	0.77

Tested by:- [signature] Checked by: [signature] Approved by: [signature]
P.D.CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Los Angeles Abrasion Test)

Project Information

Project Number : -
Project Name : MUNDA DAM PROJECT
Location : Pit No. 1
Boring Number : -
Test Number : Lab: No. 15538
Sample Number : 1
Sample Type : Coarse aggregates > 38 mm.
Depth : -
Elevation : -
Test Date : 23-12-98
Tester : Bashir
Checker : Sabir Hussain
Description : River bed alluvium, rounded to sub-rounded.
Remarks : -

Specimen Information

Initial Sample Weight : 10090 gm
Intermediate Sample Weight : 9972 gm
Final Sample Weight : 9450 gm
Number of Revolutions : 1000
Los Angeles Percentage of Wear : 6 %
Los Angeles Uniformity of Wear : 0.18

Tested by:-	Checked by:-	Approved by
Sabir Hussain	Masood Idris	Raja Zafarullah Minhas
ARO (Rock Mech:)	Incharge Rock Mech: Lab.	Projector Director-CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Los Angeles Abrasion Test)

Project Information

Project Number	-
Project Name	MUNDA DAM PROJECT
Location	Pit No. 3
Boring Number	-
Test Number	Lab: No. 15538
Sample Number	1
Sample Type	Coarse aggrgates ‹ 38mm.
Depth	-
Elevation	-
Test Date	23-12-98
Tester	Bashir
Checker	Sabir Hussain
Description	River bed alluvium, rounded to sub-rounded.
Remarks	-

Specimen Information

Initial Sample Weight	10061 gm
Intermediate Sample Weight	9966 gm
Final Sample Weight	9546 gm
Number of Revolutions	1000
Los Angeles Percentage of Wear	5 %
Los Angeles Uniformity of Wear	0.18

Tested by:-
Sabir Hussain
ARO (Rock Mech:)

Checked by:-
Masood Idris
Incharge Rock Mech: Lab.

Approved by
Raja Zafarullah Minhas
Projector Director-CMTL

Central Material Testing Laboratories, Lahore

Rock Mechanics Laboratory

(Los Angeles Abrasion Test)

Project Information

Project Number :	-
Project Name :	MUNDA DAM PROJECT
Location :	Pit NO. 5
Boring Number :	-
Test Number :	Lab: No. 15538
Sample Number :	1
Sample Type :	Coarse aggregates > 38 mm.
Depth :	-
Elevation :	-
Test Date :	23-12-98
Tester :	Bashir
Checker :	Sabir Hussain
Description :	River bed alluvium, rounded to sub-rounded.
Remarks :	-

Specimen Information

Initial Sample Weight :	10073 gm
Intermediate Sample Weight :	9992 gm
Final Sample Weight :	9525 gm
Number of Revolutions :	1000
Los Angeles Percentage of Wear :	5 %
Los Angeles Uniformity of Wear :	0.15

Tested by:-	Checked by:-	Approved by
Sabir Hussain	Masood Idris	Raja Zafarullah Minhas
ARO (Rock Mech:)	Incharge Rock Mech: Lab.	Projector Director-CMTL

CENTRAL MATERIAL TESTING LABORATORY
LAHORE.

TEST RESULTS

Chemical Alkali Reactivity Test
ASTM C-289

AGENCY: JICA Study Team,Peshwar.

PROJECT: MUNDA DAM

REF: JM-101 Dated: 02/10/98

LAB. NO: 15538

Sr.No.	Pit No.	Source	Type of Material	Sc. (m.moles lit)	Rc. (m.moles lit)
1	1	Swat River	Agg. River bed	21.15	80.00
2	2	"	"	24.31	90.00
3	3	"	"	12.32	40.00
4	5	"	"	17.65	72.50
5	7	"	"	18.15	105.00

The aggregates are in Innocuous region.

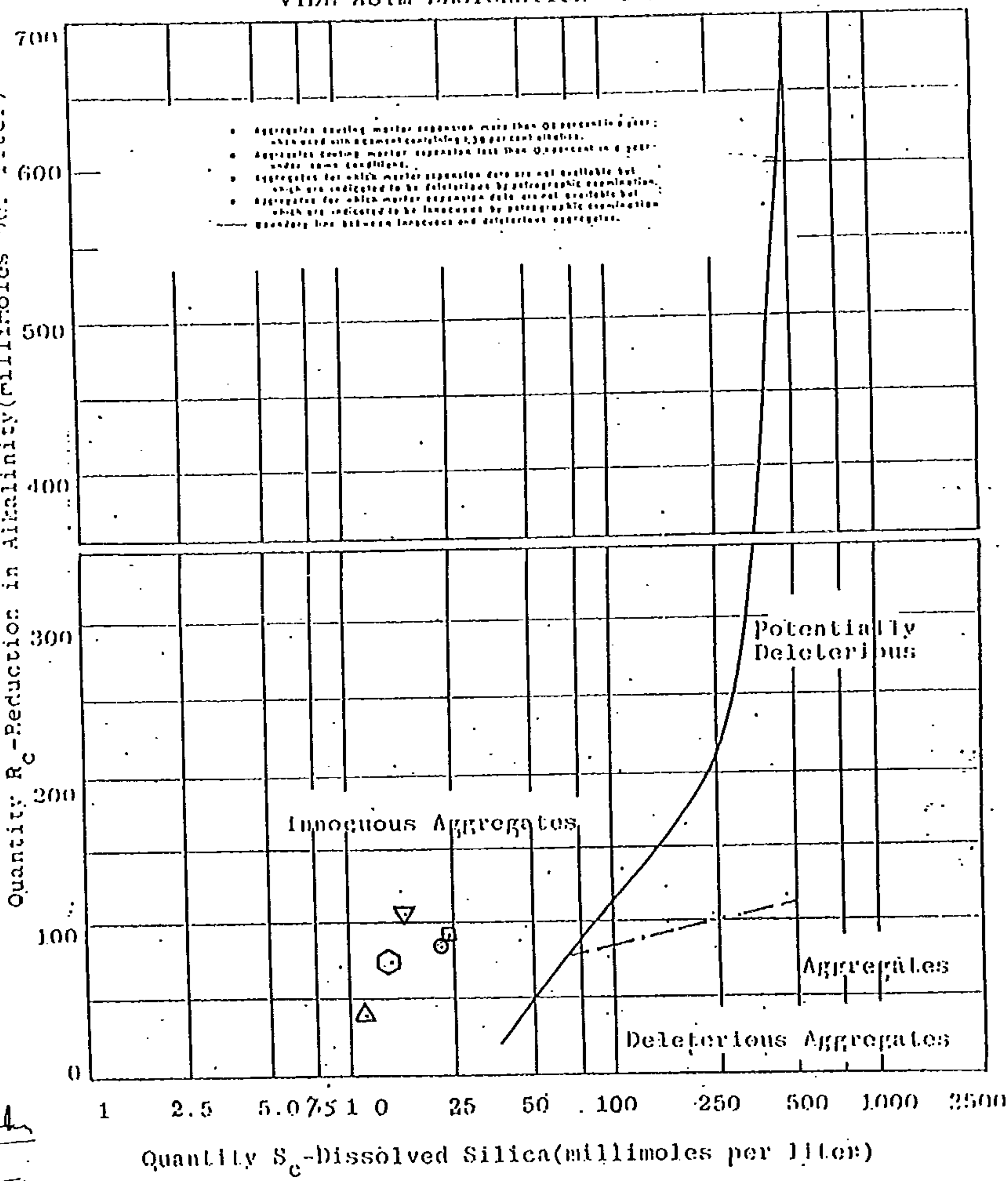
TESTED BY: CHECKED BY APPROVED BY:
P.D.CMTL.

MUNDA DAM PROJECT

PIT No. 1 = ⊙
PIT No. 2 = ⊡
PIT No. 3 = △
PIT No. 5 = ⬡
PIT No. 7 = ▽

INTERPRETATION OF CHEMICAL TEST RESULTS

VIDE ASTM DESIGNATION C 289



D.D. CMTL

LABORATORY TEST ON ROCK MATERIAL

	Samples
Water absorption and bulk specific gravity test (ASTM C127)	25
Unconfined compression test of rock core specimen (ASTM D2938)	25
Triaxial compression test of rock core specimen (ASTM D2664)	5

CENTRAL MATERIAL TESTING LABORATORY, LAHORE
SUMMARY OF TEST RESULTS

Project: Munda Dam Multipurpose Project.

Sr. No.	LabNo.	Bore Hole No.	Sample No.	Depth (m)	Water absorption %	Bulk density kg/m^3	UCS MPa	C MPa	ϕ deg.
1	15538-R1	M-98-1	1	8.63-8.90	2.34	2633	11.52	-	-
2	15538-R2	M-98-2	1	44.48-44.91	0.37	2778	11.52	-	-
3	15538-R3	M-98-3	1	16.0-16.27	0.46	2844	13.40	-	-
4	15538-R4	M-98-4	1	14.67-14.82	0.13	2943	10.37	-	-
5	15538-R5	M-98-6	1	9.46-9.73	0.19	2794	12.10	-	-
6	15538-R6	M-98-7	1	3.36-3.69	0.41	2989	14.40	-	-
7	15538-R7	M-98-8	1	15.00-15.67	0.10	2977	50.72	-	-
8	15538-R8	M-98-9	1	9.40-9.66	0.16	2935	19.02	-	-
9	15538-R9	M-98-10	1	5.50-5.70	0.47	2833	40.34	-	-
10	15538-R10	M-98-11	1	8.38-8.62	0.39	2895	19.02	-	-
11	15538-R11	QS-1	S-2	4.40-4.65	0.06	2664	39.18	-	-
12	15538-R12	QS-1	S-3	10.32-10.73	0.03	2667	32.33	-	-
13	15538-R13	QS-1	S-4	20.23-20.52	0.21	2678	31.35	-	-
14	15538-R14	QS-1	S-5	27.73-28.00	0.07	2678	32.13	-	-
15	15538-R15	QS-1	S-6	37.15-37.43	0	2687	35.07	-	-
16	15538-R16	QT-3	S-1	3.70-3.85	0.42	2751	8.50	-	-
17	15538-R17	QT-3	S-2	8.35-8.52	0	2711	66.81	-	-
18	15538-R18	QT-3	S-3	13.82-14.00	1.50	2634	13.78	-	-
19	15538-R19	QT-3	S-4	20.60-20.75	0.88	2614	22.27	-	-
20	15538-R20	QT-3	S-5	47.55-47.70	0.08	2701	58.33	-	-
21	15538-R21	QT-2	S-1	4.86-5.00	0.53	2674	69.20	-	-
22	15538-R22	QT-2	S-2	19.44-19.60	0.10	2720	68.93	-	-
23	15538-R23	QT-2	S-3	26.40-26.52	0.23	2709	167..0	-	-
24	15538-R24	QT-2	S-4	44.45-44.58	0.17	2711	153.78	-	-
25	15538-R25	QT-2	S-5	55.70-55.88	0.17	2758	84.84	-	-
26	15538-R26	M-98-1	1	08.18-08.48	-	-	-	3.3	32.6
27	15538-R27	M-98-2	1	47.00-47.48	-	-	-	11.54	25.4
28	15538-R28	M-98-3	1	16.30-16.93	-	-	-	5.9	33.7
29	15538-R29	M-98-4	1	14.18-14.51	-	-	-	3.6	35.0
30	15538-R30	M-98-8	1	15.00-15.67	-	-	-	10.5	41.8

CENTRAL MATERIAL TESTING LABORATORY, LAHORE
ROCK MECHANICS LABORATORY
(HOEK TRIAXIAL TEST)

PROJECT: Munda Dam Multipurpose Project Date: 20-02-99

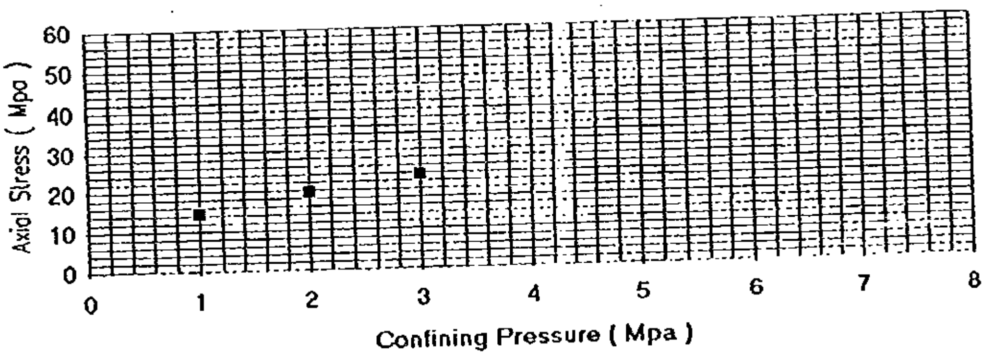
Lab. No. 15538-R26

Bore Hole No. M-98-1 Angle of internal friction ϕ = 32.6

Depth (m) 08.18-08.48 Apparent cohision. C' = 3.3

Rock Type. *Schist*

Confining Pressure (MPa)	Axial Stress (MPa)
1	14.4
2	19.6
3	23.6



Tested by:
M. Afzal
ARO-CMTL

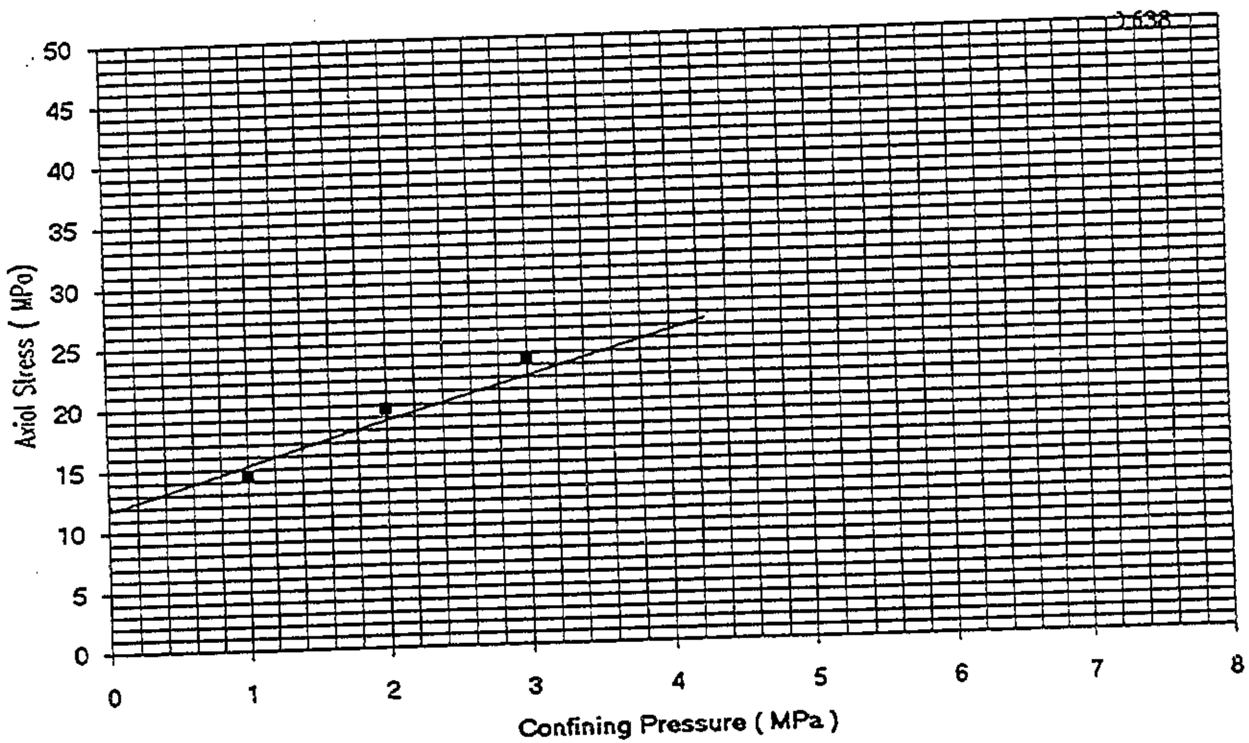
Checked by:
Masood Idris
Incharge Rock Mech. Lab.

Approved by:
Raja Zafarullah Minhas
Project Directore-CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE.

Lab. No. 15538-R26 | Bore Hole No. M-98-1 | Depth (m): 08.18 - 08.48

Axial Stress vs Confining Pressure



Location: Munda Dam Multipurpose Project

Date: 20-02-1999

Calculations

x	=3.6
y	=12
Tangent of inclination y/x,(m)	=3.333
arc sin m-1/m+1	=0.538
ϕ	=32.6°
2cosϕ	=1.686
1-sinϕ	=0.462
Y- intercept , 'b' (Mpa)	=12
Apparent Cohesion 'C' (MPa)	=3.3

Tested and computed by:
M.Afzal
ARO CMTL

D.D; CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE
ROCK MECHANICS LABORATORY
(HOEK TRIAXIAL TEST)

PROJECT: Munda Dam Multipurpose Project. Date: 20-02-99

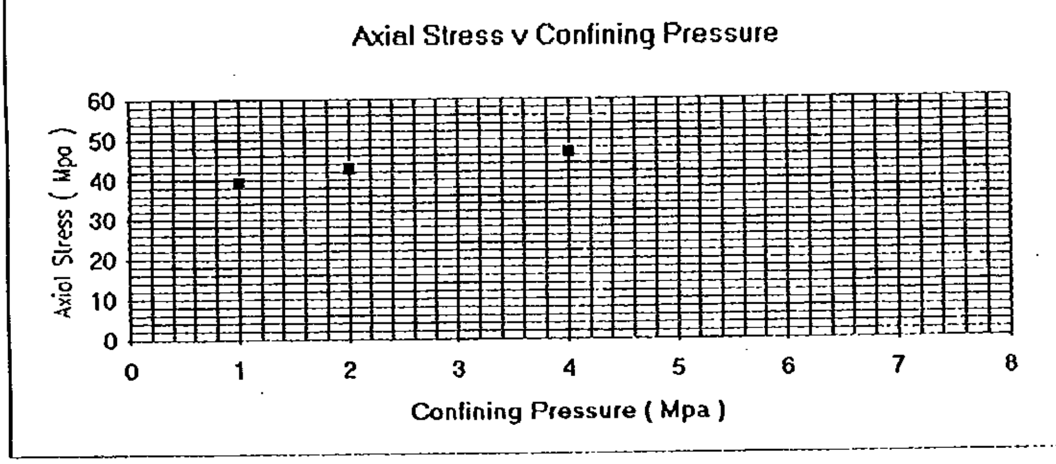
Lab. No. 15538-R27

Bore Hole No. M-98-2 Angle of internal friction o = 25.4

Depth (m) 47.00-47.48 Apparent cohesion. C' = 11.54

Rock Type. *Granite Mica Schist*

Confining Pressure (MPa)	Axial Stress (MPa)
1	39.2
2	42.7
4	46.7



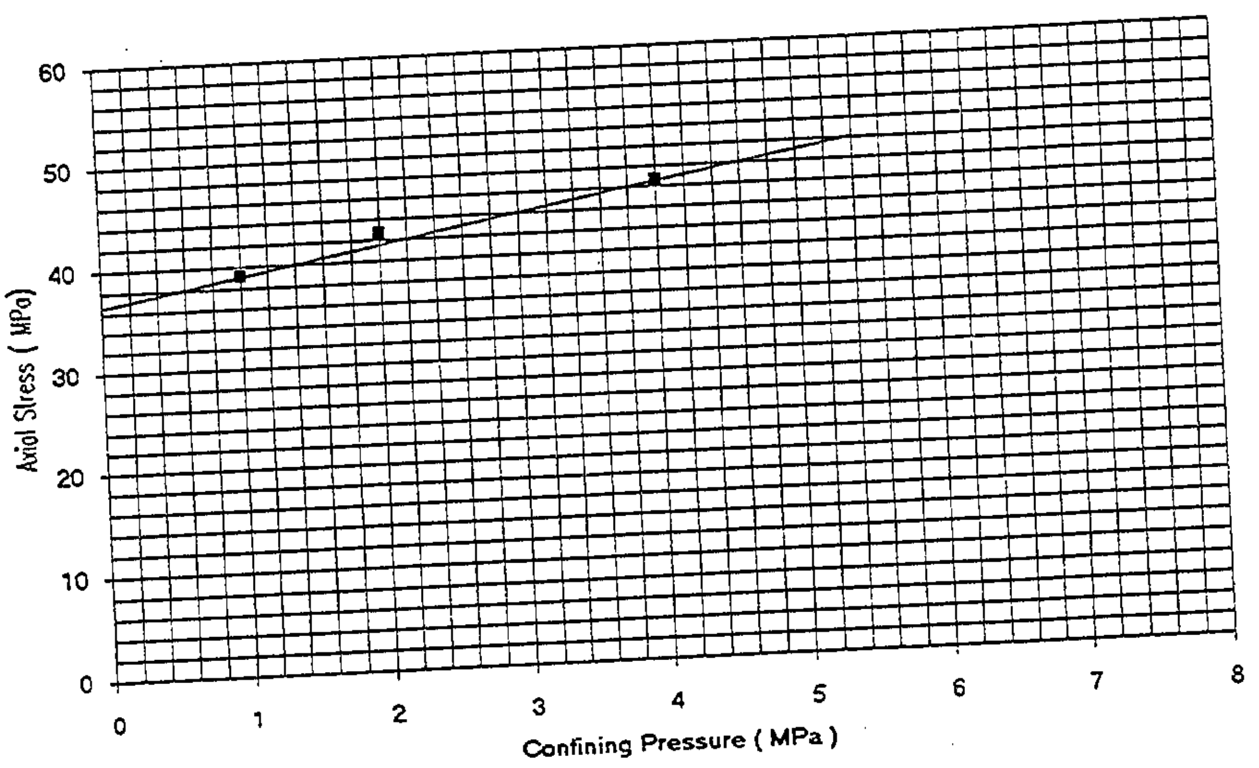
Tested by:
M. Afzal
ARO-CMTL

Checked by:
Masood Idris
Incharge Rock Mech. Lab.

Approved by:
Raja Zafarullah Minhas
Project Directore-CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE.

Lab. No.15538- R27 | Bore Hole No. M-98-2 | Depth (m): 47.000 - 47.48



Location: | Munda Dam Multipurpose Project (Main Dam) | Date: 20-02-1999

Calculations

x	=4
y	=10
Tangent of inclination y/x,(m)	=2.5
arc sin m-1/m+1	=0.429
ϕ	=25.4°
2cosϕ	=1.807
1-sinϕ	=0.571
Y- intercept , 'b' (Mpa)	=36.5
Apparent Cohesion 'C' (MPa)	=11.54

Tested and computed by:
M.Afzal
ARO CMTL

P.D: CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE
ROCK MECHANICS LABORATORY
(HOEK TRIAXIAL TEST)

PROJECT: Munda Dam Multipurpose Project. Date: 20-02-99

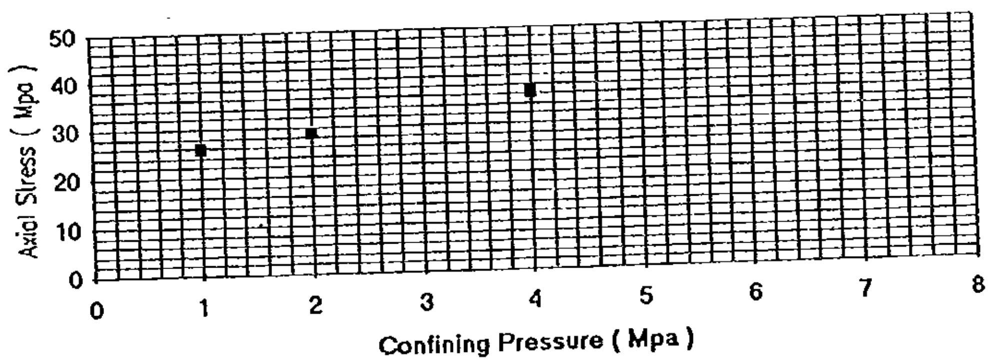
Lab. No. 15538-R28

Bore Hole No. M-98-3 Angle of internal friction $\phi = 33.7$

Depth (m) 16.3-16.93 Apparent cohision. $C' = 5.9$

Rock Type. *Schist*

Confining Pressure (MPa)	Axial Stress (MPa)
1	25.9
2	28.8
4	36.3



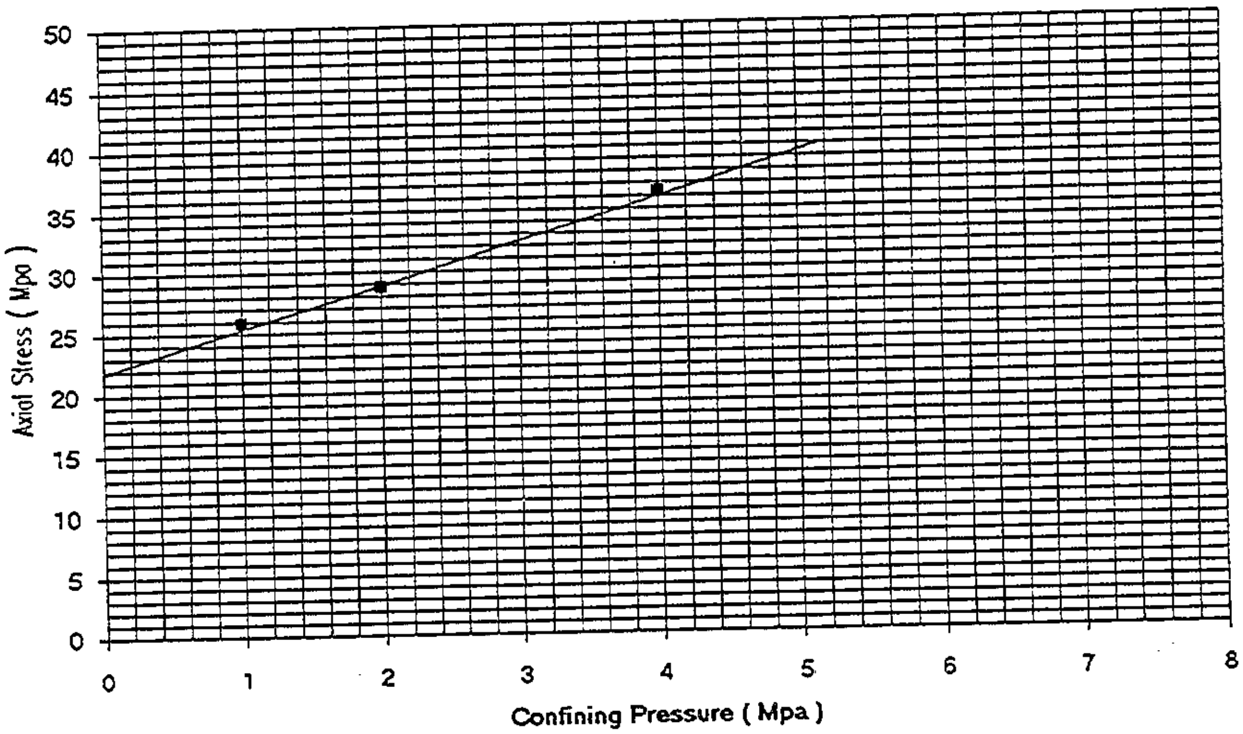
Tested by:
M. Afzal
ARO-CMTL

Checked by:
Masood Idris
Incharge Rock Mech. Lab.

Approved by:
Raja Zafarullah Minhas
Project Directore-CMTL

CENTRAL MATERIAL TESTING LABORATORY. LAHORE.

Lab. No. 15538-R28 | Bore Hole No. M-98-3 | Depth (m): 16.30 - 16.93



Location: Munda Dam Multipurpose Project (Main Dam) | Date: 20 - 02 - 1999

Calculations

x	=4
y	=14
Tangent of inclination y/x,(m)	=3.5
arc sin m-1/m+1	=0.556
ϕ	=33.7°
2cosϕ	=1.663
1-sinϕ	=0.444
Y- intercept , 'b' (Mpa)	=22
Apparent Cohesion 'C' (MPa)	=5.9

Tested and computed by:
M.Afzal
ARO CMTL

P.D. CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE
ROCK MECHANICS LABORATORY
(HOEK TRIAXIAL TEST)

PROJECT: Munda Dam Multipurpose Project. Date: 20-02-99

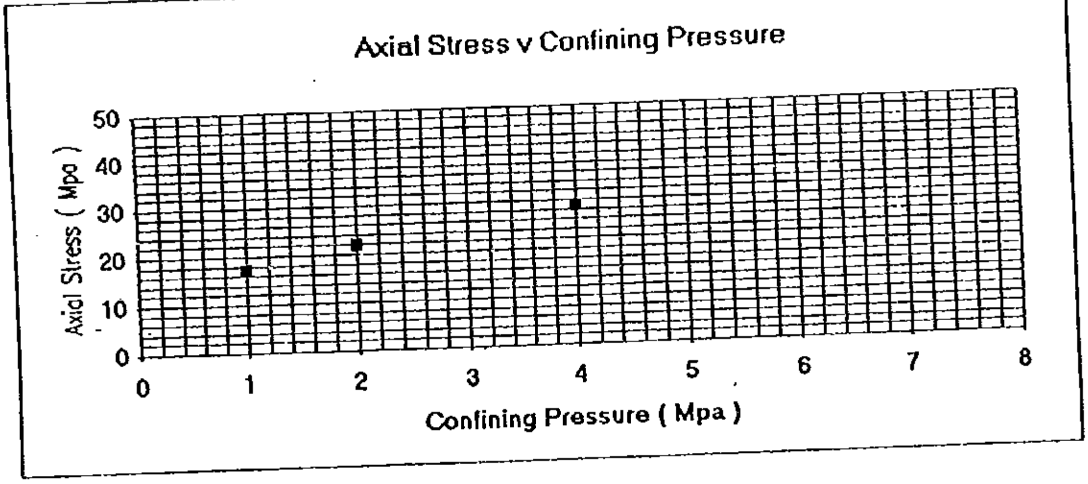
Lab. No. 15538-R29

Bore Hole No. M-98-4 Angle of internal friction $\phi = 35$

Depth (m) 14.00-14.18 Apparent cohision, $C' = 3.6$

Rock Type. *Clorite Mica Schist*

Confining Pressure (MPa)	Axial Stress (MPa)
1	17
2	21.9
4	28.8



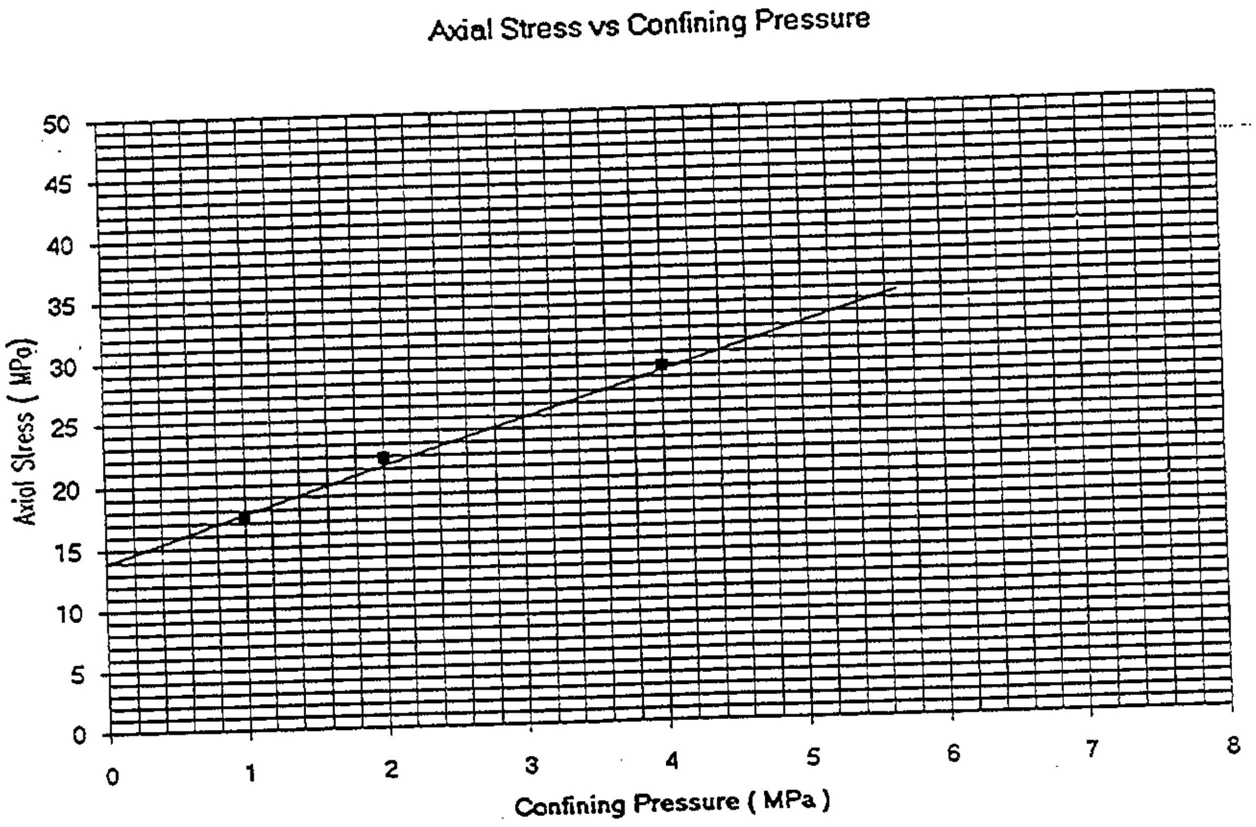
Tested by:
M. Afzal
ARO-CMTL

Checked by:
Masood Idris
Incharge Rock Mech. Lab.

Approved by:
Raja Zafarullah Minhas
Project Directore-CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE.

Lab. No. 15538-R29	Bore Hole No. M-98-4	Depth (m): 14.00 - 14.18



Location: Munda Dam Multipurpose Project (Main Dam) Date: 20-02-1999

Calculations

x	=4.4
y	=16
Tangent of inclination y/x,(m)	=3.63
arc sin m-1/m+1	=0.573
ϕ	=35°
2cosϕ	=1.639
1-sinϕ	=0.427
Y- intercept , 'b' (Mpa)	=14
Apparent Cohesion 'C' (MPa)	=3.6

Tested and computed by: M.Afzal
ARO CMTL

P.D; CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE

ROCK MECHANICS LABORATORY

(HOEK TRIAXIAL TEST)

PROJECT: Munda Dam Multipurpose Project. Date: 21-02-99

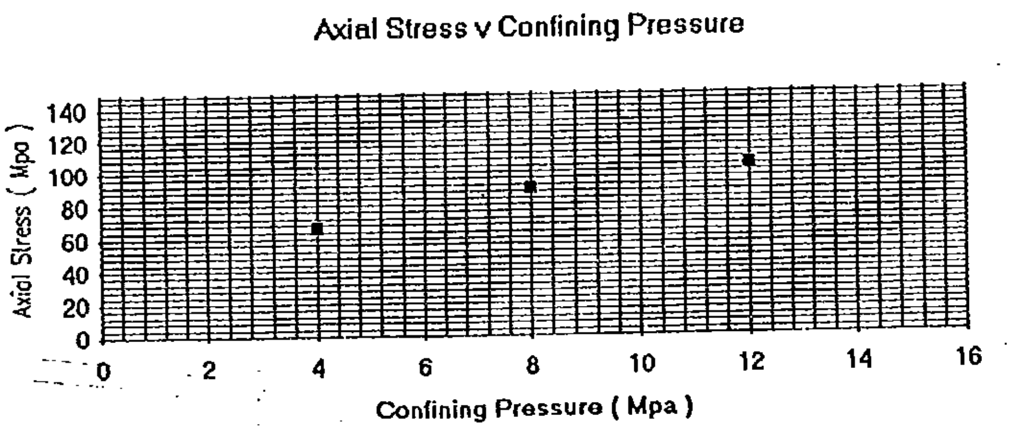
Lab. No. 15538-R30

Bore Hole No. M-98-8 Angle of internal friction ϕ = 41.8

Depth (m) 15.00-15.67 Apparent cohision. C = 10.5

Rock Type. *Quartz Mica Schist*

Confining Pressure (MPa)	Axial Stress (MPa)
4	66.3
8	89.3
12	103.7



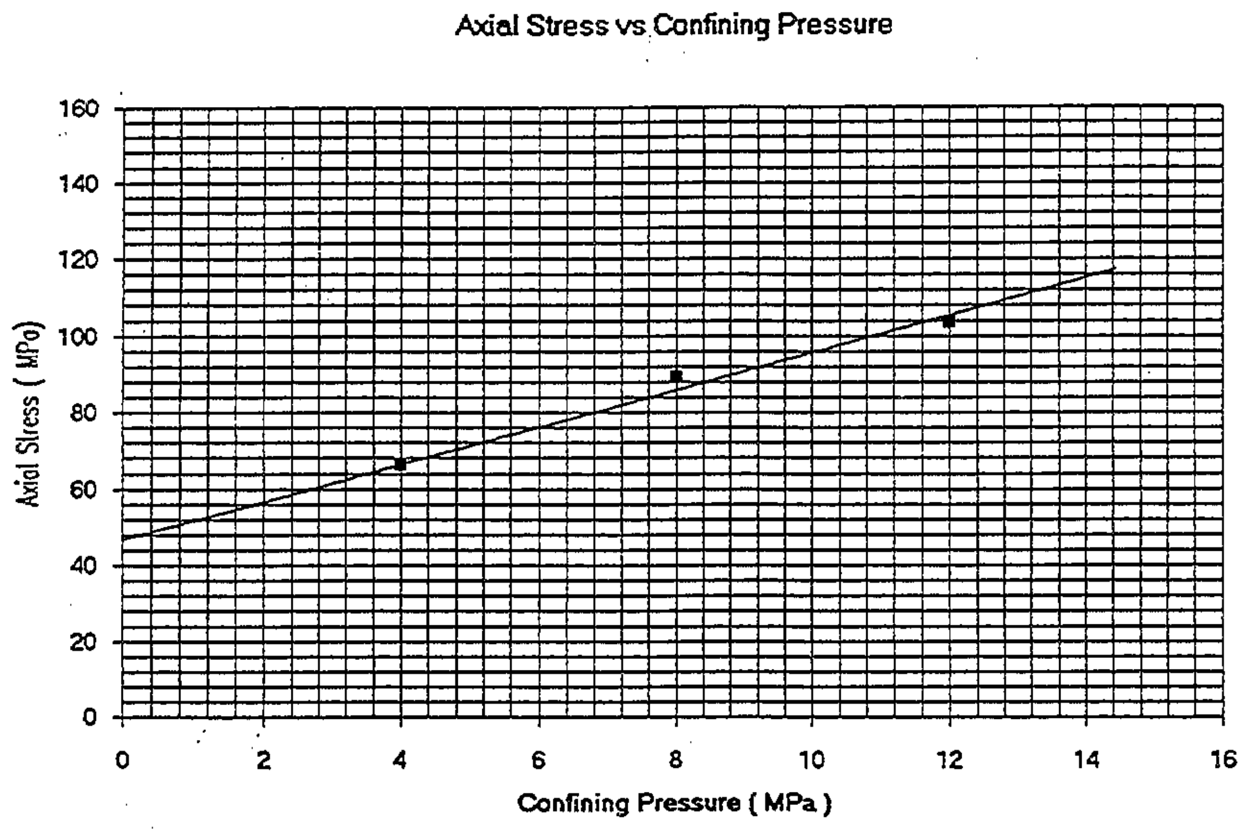
Tested by:
M. Afzal
ARO-CMTL

Checked by:
Masood Idris
Incharge Rock Mech. Lab.

Approved by:
Raja Zafarullah Minhas
Project Directore-CMTL

CENTRAL MATERIAL TESTING LABORATORY, LAHORE.

Lab. No. 15538-R30 | bore Hole No. M-98-5 | Depth (m): 15.00 - 15.67



Location: Munda Dam Multipurpose Project. (Main Dam) | Date: 21-02-1999

Calculations

x	=9.6
y	=48
Tangent of inclination y/x,(m)	=5.0
arc sin m-1/m+1	=0.667
ϕ	=41.8°
2cosϕ	=1.491
1-sinϕ	=0.333
Y- intercept, 'b' (Mpa)	=47
Apparent Cohesion 'C' (MPa)	=10.5

Tested and computed by: M.Afzal
ARO CMTL

D.D, CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:-Munda Dam Multipurpose Project (N W F P)

Bore Hole . M 98-1 Sample No - Depth : 8.63-8.90 m

Dia (mm): 47 Height: (mm): 94.46 Area (mm²): 1734.94

Description:- Mica Schist

Test Information: *Lab: No. 15538 / R-1*

Type of Machine:	CONTROLL'S
Failure Load (KN):	20
Failure Time (min):	2
Loading Rate (KN/min):	10

Summary of Results:

Bulk density (kg/m³):	2633
Water absorption %	2.34
Compressive Strength (MPa):	11.52
Mode of Failure:	Digonal Shear

Remarks:- Failure plane fresh, non-homogeneity seen on the shear surface.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories, Lahore
Rock Mechanics Laboratory
(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore Hole . M 98-2 **Sample No.** - **Depth :** 44.48-44.91 m

Dia (mm): 47 **Height: (mm):** 96.36 **Area (mm²):** 1734.94

Description:- Quartzite Mica Schist

Test Information: *Lab: No. 15538 / R-2*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	20
Failure Time (min):	2
Loading Rate (KN/min):	10

Summary of Results:

Bulk density (kg/m³):	2778
Water absorption %	0.37
Compressive Strength (MPa):	11.52
Mode of Failure:	Digonal Shear

Remarks:- Failure plane fresh.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M 98-3 **Sample: No.-** **Depth:** 16.00- 16.27 m

Dia: (mm): 47 **Height: (mm):** 95.1 **Area (mm^2):** 1734.94

Description:- Schist

Test Information: *Lab: No. 15538 / R-3*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	23.25
Failure Time (min):	2
Loading Rate (KN/min):	11

Summary of Results:

Bulk density (kg/m^3):	2844
Water absorption %	0.46
Compressive Strength (MPa):	13.40
Mode of Failure:	Digonal Shear

Remarks:- Failure plane fresh.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Meohanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M 98-4   **Sample: No.** -   **Depth:** 14.67-14.82 m

Dia: (mm): 47   **Height: (mm):** 94.9   **Area (mm^2):** 1734.94

Description:- Chlorite Mica Schist

Test Information: *Lab: No. 15538 / R-4*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	18
Failure Time (min):	2
Loading Rate (KN/min):	9

Summary of Results:

Bulk density (kg/m^3):	2943
Water absorption %	0.13
Compressive Strength (MPa):	10.37
Mode of Failure:	Diagonal Shear

Remarks:- Failure plane fresh.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M98-6 **Sample: No** - **Depth:** 9.46 - 9.73m

Dia: (mm): 47 **Height (mm):** 94 **Area (mm²):** 1734.94

Description:- Mica Schist

Test Information: *Lab: No. 15538 / R-5*

Type of Machine: CONTROLL 'S

Failure Load (KN): 21

Failure Time (min): 2

Loading Rate (KN/min): 11

Summary of Results:

Bulk density (kg/m^3): 2794

Water absorption % 0.19

Compressive Strength (MPa): 12.10

Mode of Failure: Diagonal shear

Remarks:- Failure surface fresh.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D - CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M 98-7 **Sample: No.** - **Depth:** 3.36-3.69 m

Dia: (mm): 47 **Height: (mm):** 92.9 **Area (mm^2):** 1734.94

Description:- Schist

Test Information: *Lab: No. 15538 / R-6*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	25
Failure Time (min):	3
Loading Rate (KN/min):	8

Summary of Results:

Bulk density (kg/m^3):	2989
Water absorption %	0.41
Compressive Strength (MPa):	14.40
Mode of Failure:	Diagonal Shear

Remarks:- Failure plane fresh, oxidation present.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M 98-8 Sample: No. - Depth: 15.00 - 15.67 m

Dia: (mm): 47 Height(mm):101.4 Area (mm²): 1734.94

Description:- Quartzite Mica Schist

Lab: No. 15538 / R-7

Test Information:

Type of Machine:	CONTROLL 'S
Failure Load (KN):	88
Failure Time (min):	6
Loading Rate (KN/min):	15

Summary of Results:

Bulk density (kg/m³):	2977
Water absorption %	0.10
Compressive Strength (MPa):	50.72
Mode of Failure:	Digonal Shear

Remarks:- Failure plane fresh and homogenious.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M 98-9 **Sample: No.** - **Depth:** 9.40 - 9.66 m

Dia: (mm): 47 **Height(mm):** 96.36 **Area (mm^2):** 1734.94

Description:- Schist

Test Information: *Lab: No. 15538 / R-8*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	33
Failure Time (min):	3
Loading Rate (KN/min):	11

Summary of Results:

Bulk density (kg/m^3):	2935
Water absorption %	0.16
Compressive Strength (MPa):	19.02
Mode of Failure:	Digonal Shear

Remarks:- Failure plane fresh with some spots of calcite.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.O CMTL

Central Material Testing Laboratories,Lahore
Rock Mechanics Laboratory
(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M 98-10 **Sample: No. -** **Depth:** 5.50 - 5.70 m

Dia: (mm): 47 **Height: (mm):** 99.6 **Area (mm²):** 1734.94

Description:- Schist

Test Information: *Lab: No. 15538 / R-9*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	70
Failure Time (min):	5
Loading Rate (KN/min):	14

Summary of Results:

Bulk density (kg/m³):	2833
Water absorption %	0.47
Compressive Strength (MPa):	40.34
Mode of Failure:	Axial Shear

Remarks:- Oxidation seen on the failure plane.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . M 98-11 **Sample: No. -** **Depth:** 8.38 - 8.62 m

Dia: (mm): 47 . **Height(mm):** 100.5 **Area (mm²):** 1734.94

Description:- Schist

Test Information: *Lab: No. 15538 / R-10*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	33
Failure Time (min):	3
Loading Rate (KN/min):	11

Summary of Results:

Bulk density (kg/m³):	2895
Water absorption %	0.39
Compressive Strength (MPa):	19.02
Mode of Failure:	Along discontinuity

Remarks: Shear plane fresh, failure at 16° to core axis.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . QS-1 **Sample:** No.S-2 **Depth:** 4.40 - 4.65 m

Dia: (mm): 57 **Height: (mm):** 113.6 **Area (mm²):** 2551.75

Description:- LIMESTONE

Test Information: *Lab: No. 15538 / R-11*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	100
Failure Time (min):	5
Loading Rate (KN/min):	20

Summary of Results:

Bulk density (kg/m³):	2664
Water absorption %	0.06
Compressive Strength (MPa):	39.18
Mode of Failure:	Splitted axially

Remarks:- Oxidation present on the shear surface.

Tested by:-
Sabir-Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . QS-1 **Sample:** No.S-3 , **Depth:** 10.32 - 10.73m

Dia: (mm): 57 **Height (mm):** 115.3 **Area (mm²):** 2551.75

Description:- LIMESTONE

Test Information: *Lab: No. 15538 / R-12*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	82.5
Failure Time (min):	5
Loading Rate (KN/min):	16

Summary of Results:

Bulk density (kg/m³):	2667
Water absorption %	0.03
Compressive Strength (MPa):	32.33
Mode of Failure:	Splitted axially

Remarks:- Failure plane fresh,

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore
Rock Mechanics Laboratory
(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . QS-1 **Sample: No.** S-4 **Depth:** 20.23 - 20.52 m

Dia: (mm): 57 **Height (mm):** 114.46 **Area (mm²):** 2551.75

Description:- LIMESTONE

Test Information: *Lab: No. 15538 / R-13*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	80
Failure Time (min):	5
Loading Rate (KN/min):	16

Summary of Results:

Bulk density (kg/m³):	2678
Water absorption %	0.21
Compressive Strength (MPa):	31.35
Mode of Failure:	Shear

Remarks:- Failure plane fresh,

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . QS-1 **Sample: No.** S-5 **Depth:** 27.73 - 28 00 m

Dia: (mm): 57 **Height (mm):** 117.6 **Area (mm²):** 2551.75

Description;- LIMESTONE

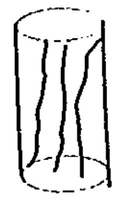
Lab: No. 15538 / R-14

Test Information:

Type of Machine:	CONTROLL 'S
Failure Load (KN):	82
Failure Time (min):	5
Loading Rate (KN/min):	16

Summary of Results:

Bulk density (kg/m³):	2678
Water absorption %	0.07
Compressive Strength (MPa):	32.13
Mode of Failure:	Axially splitted



Remarks:- Failure plane fresh.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D - CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . QS-1 **Sample: No.** S-6 **Depth:** 37.15 - 37.43m

Dia: (mm): 57 **Height (mm):** 117.8 **Area (mm²):** 2551.75

Description:- LIMESTONE

Test Information: *Lab: No. 15538 / R-15*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	89.5
Failure Time (min):	6
Loading Rate (KN/min):	15

Summary of Results:

Bulk density (kg/m³):	2687
Water absorption %	0.00
Compressive Strength (MPa):	35.07
Mode of Failure:	Axially splitted

Remarks:- Failure plane fresh.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.O - CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Ot-3 **Sample: No.** 1 **Depth:** 3.70 - 3.85m

Dia: (mm): 49 **Height (mm):** 98.36 **Area (mm²):** 1885.74

Description:- Quartz Mica Schist

Test Information: *Lab: No. 15536 / R-16*

Type of Machine:	CONTROLLS
Failure Load (KN):	16
Failure Time (min):	2
Loading Rate (KN/min):	8

Summary of Results:

Bulk density (kg/m³):	2751
Water absorption %	0.42
Compressive Strength (MPa):	8.5

Mode of Failure: Sheared along foliation plane

Remarks:- Oxidation present at the failure surface.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D - CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole : Qt-3 **Sample: No.** 2 **Depth:** 8.35 - 8.52m

Dia: (mm): 49 **Height (mm):** 98 **Area (mm²):** 1885.74

Description:- Quartzite

Lab: No. 15538 / R-17

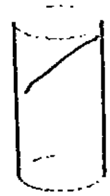
Test Information:

Type of Machine:	CONTROLL 'S
Failure Load (KN):	126
Failure Time (min):	11
Loading Rate (KN/min):	12

Summary of Results:

Bulk density (kg/m³):	2711
Water absorption %	0.00
Compressive Strength (MPa):	66.81

Mode of Failure: Sheared along joint.



Remarks:- Failure surface fresh.

Tested by:-
Sabir Hussain
ARO

Checked :
Masood Idris
Incharge Rock Lab

Approved by
Raja Zafarullah Minhas
P.D - CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-3 **Sample: No.** 3 **Depth:** 13.82 - 14.0m

Dia: (mm): 49 **Height (mm):** 103.8 **Area (mm^2):** 1885.74

Description:- Quartz Mica Schist

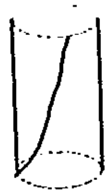
Lab: No. 15538 / R-18

Test Information:

Type of Machine:	CONTROLL 'S
Failure Load (KN):	26
Failure Time (min):	2
Loading Rate (KN/min):	13

Summary of Results:

Bulk density (kg/m^3):	2634
Water absorption %	1.50
Compressive Strength (MPa):	13.78
Mode of Failure:	Diagonal shear



Remarks:- Failure plane fresh.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab.

Approved by
Raja Zafarullah Minhas
P.D - CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-3 Sample: No. 4 Depth 20.60 - 20.75m

Dia: (mm): 49 Height (mm): 103.3 Area (mm²): 1885.74

Description:- Quartz Mica Schist

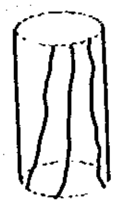
Lab: No. 15538 / R-19

Test Information:

Type of Machine:	CONTROLL 'S
Failure Load (KN):	42
Failure Time (min):	3
Loading Rate (KN/min):	14

Summary of Results:

Bulk density (kg/m³):	2614
Water absorption %	0.88
Compressive Strength (MPa):	22.27
Mode of Failure:	Axially splitted



Remarks:- Failure plane fresh with some mica flakes.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab

Approved by
Raja Zafarullah Minhas
P.D - CMTL

Central Material Testing Laboratories,Lahore
Rock Mechanics Laboratory
(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-3 Sample: No. 5 Depth: 47.55 - 47.70m

Dia: (mm): 49 Height (mm): 10136 Area (mm^2): 1885.74

Description:- Quartzite

Lab: No. 15538 / R-20

Test Information:

Type of Machine:	CONTROLL 'S
Failure Load (KN):	110
Failure Time (min):	8
Loading Rate (KN/min):	13

Summary of Results:

Bulk density (kg/m^3):	2701
Water absorption %	0.08
Compressive Strength (MPa):	58.33
Mode of Failure:	Sheared along weak zone

Remarks:- Oxidation present at the failure surface.

Tested by:-
Sabir Hussain
ARO

Checked by:-
Masood Idris
Incharge Rock Lab:

Approved by
Raja Zafarullah Minhas
P.D - CMTL

Central Material Testing Laboratories,Lahore
Rock Mechanics Laboratory
(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-2 **Sample: No.** 1 **Depth:** 4.86 - 5.00m

Dia: (mm): 49 **Height: (mm):** 101.7 **Area (mm²):** 1885.74

Description:- Quartz Mica Schist

Test Information: *Lab: No. 15538 / R-21*

Type of Machine: CONTROLL 'S

Failure Load (KN): 130.5

Failure Time (min): 9

Loading Rate (KN/min): 15

Summary of Results:

Bulk density (kg/m³): 2674

Water absorption % 0.53

Compressive Strength (MPa): 69.20

Mode of Failure: Spalling

Remarks:- Type homogenious, fine grained, spalling failure occured axially.

Tested by:-
Sabir Hussain
APO CMTL

Checked by:-
Masood Idris
Incharge Rock Mech.Lab

Approved by
Raja Zafarullah Minhas
P.D. CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-2 **Sample: No.** 2 **Depth:** 19.44 - 19.60m

Dia: (mm): 49 **Height: (mm):** 102.4 **Area (mm²)·** 1885.74

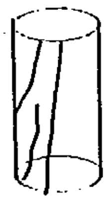
Description:- Quartz Mica Schist

Test Information: *Lab: No. 15538 / R-22*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	130
Failure Time (min):	9
Loading Rate (KN/min):	15

Summary of Results:

Bulk density (kg/m³):	2720
Water absorption %	0.10
Compressive Strength (MPa):	68.93
Mode of Failure:-	Axially splitted



Remarks;- Failure surface fresh, at 45° to core axis.

Tested by:-
Sabir Hussain
ARO CMTL

Checked by:-
Masood Idris
Incharge Rock Mech.Lab.

Approved by
Raja Zafarullah Minhas
P.D. CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-2	**Sample:** No. 3	**Depth:** 26.40 - 26.52m
Dia: (mm): 49	**Height: (mm):** 100.16	**Area (mm²):** 1885.74

Description:- "Quartzite"

Test Information: *Lab: No. 15538 / R-23*

Type of Machine:	CONTROLL'S
Failure Load (KN):	315
Failure Time (min):	15
Loading Rate (KN/min):	21

Summary of Results:

Bulk density (kg/m³):	2709
Water absorption %	0.23
Compressive Strength (MPa):	167
Mode of Failure:	Abrupt failure

Remarks:- Failure surface fresh, fine grained, no discontinuity present, good rock.

Tested by:-
Sabir Hussain
ARO CMTL

Checked by:-
Masood Idris
Incharge Rock Mech.Lab

Approved by
Raja Zafarullah Minhas
P.D. CMTL

Central Material Testing Laboratories,Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-2 Sample: No. 4 Depth: 44.45 - 44 58m

Dia: (mm): 49 Height: (mm): 103.8 Area (mm^2): 1885.74

Description:- Quartz Mica Schist

Test Information: *Lab: No. 15538 / R-24*

Type of Machine:	CONTROLL 'S
Failure Load (KN):	290
Failure Time (min):	14
Loading Rate (KN/min):	20

Summary of Results:

Bulk density (kg/m^3):	2711
Water absorption %	0.17
Compressive Strength (MPa):	153.78
Mode of Failure:	Diagonal shear

Remarks:- Failure surface fresh.

Tested by:-
Sabir Hussain
ARO CMTL

Checked by:-
Masood Idris
Incharge Rock Mech Lab

Approved by
Raja Zafarullah Minhas
P D CMTL

Central Material Testing Laboratories, Lahore

Rock Mechanics Laboratory

(Unconfined Compressive Strength)

Project:- Munda Dam Multipurpose Project (N W F P)

Bore: Hole . Qt-2 **Sample: No.** 5 **Depth:** 55.70 - 55.88m

Dia: (mm): 49 **Height: (mm):** 99.5 **Area (mm²):** 1885.74

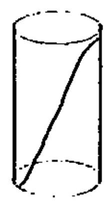
Description:- Quartz Mica Schist

Test Information: *Lab: No. 15538 / R-25*

Type of Machine:	CONTROLL'S
Failure Load (KN):	160
Failure Time (min):	10
Loading Rate (KN/min):	16

Summary of Results:

Bulk density (kg/m³):	2758
Water absorption %	0.17
Compressive Strength (MPa):	84.84
Mode of Failure:	Diagonal shear



Remarks:- Failure plane fresh.

Tested by:-
Sabir Hussain
ARO CMTL

Checked by:-
Masood Idris
Incharge Rock Mech. Lab.

Approved by
Raja Zafarullah Muthas
P.D. CMTL

GE6.

LIST OF EARTHQUAKE 1973-1998, ESTIMATED EARTHQUAKE INTENSITY FELT AT MUNDA DAMSITE

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1973	1	2	137	4.8	192	1.533	-1.573
1973	1	10	110	4.3	210	0.770	-2.786
1973	1	12	126	5.2	194	2.181	-0.798
1973	1	15	33	3.8	265	-0.276	-4.351
1973	1	15	151	3.9	289	-0.622	-4.369
1973	1	29	53	5.0	241	1.721	-1.718
1973	2	9	75	4.5	135	2.130	-1.365
1973	2	11	96	4.3	220	0.739	-2.897
1973	2	14	189	4.8	241	0.884	-2.118
1973	2	19	114	4.4	204	0.956	-2.517
1973	2	21	72	3.8	243	-0.146	-4.138
1973	2	24	231	3.4	232	-1.383	-4.825
1973	2	28	277	4.4	268	-0.289	-3.179
1973	3	7	78	5.0	236	1.703	-1.667
1973	3	10	154	3.8	251	-0.519	-4.217
1973	3	15	228	4.0	251	-0.570	-3.817
1973	3	25	86	4.8	153	2.265	-1.048
1973	4	4	112	4.7	215	1.315	-2.042
1973	4	8	230	4.7	232	0.573	-2.225
1973	4	10	125	4.5	224	0.874	-2.540
1973	4	12	189	4.9	232	1.091	-1.825
1973	4	14	33	4.1	277	0.066	-3.862
1973	4	18	243	3.4	254	-1.560	-5.047
1973	4	27	140	4.3	242	0.360	-3.128
1973	5	6	234	4.6	240	0.359	-2.508
1973	5	12	96	5.1	203	2.105	-1.105
1973	5	19	110	4.5	225	0.934	-2.551
1973	5	22	180	4.1	231	-0.055	-3.415
1973	6	6	220	5.1	227	1.255	-1.372
1973	6	11	97	4.9	265	1.237	-2.151
1973	6	14	133	4.6	285	0.517	-2.934
1973	6	14	203	5.0	232	1.167	-1.625
1973	7	11	262	3.3	217	-1.628	-4.864
1973	7	13	251	4.1	247	-0.514	-3.578
1973	7	22	217	3.7	240	-0.903	-4.308
1973	7	23	176	4.2	297	-0.315	-3.838
1973	7	23	228	4.4	246	0.057	-2.968
1973	7	23	245	3.3	236	-1.628	-5.067
1973	7	28	208	3.1	297	-2.087	-6.038
1973	8	6	222	5.4	256	1.532	-1.066
1973	8	15	200	4.8	235	0.865	-2.056
1973	8	22	239	4.6	224	0.416	-2.340
1973	8	27	142	3.6	178	-0.180	-3.796
1973	8	28	199	4.3	237	0.108	-3.077
1973	9	22	117	5.0	199	1.886	-1.258
1973	9	25	200	5.1	235	1.315	-1.456
1973	9	25	110	5.1	296	1.257	-2.029
1973	9	27	35	4.9	93	3.803	0.156
1973	9	29	71	4.0	239	0.195	-3.697
1973	10	2	65	4.9	253	1.429	-2.037
1973	10	5	228	4.3	246	-0.093	-3.168
1973	10	6	56	4.9	246	1.516	-1.968
1973	10	17	221	5.5	224	1.866	-0.540
1973	11	27	26	4.6	298	0.642	-3.047
1973	12	8	170	4.0	265	-0.385	-3.951
1973	12	9	33	5.0	244	1.726	-1.748
1973	12	16	47	5.2	251	1.936	-1.417
1973	12	17	33	4.6	221	1.367	-2.308
1974	1	11	159	4.8	221	1.176	-1.908
1974	1	17	101	4.8	129	2.434	-0.663
1974	1	22	69	4.5	228	1.058	-2.583
1974	2	6	193	4.9	240	1.020	-1.908
1974	2	7	132	4.4	190	0.931	-2.349
1974	2	19	85	5.0	183	2.220	-1.061
1974	2	22	116	5.4	238	2.146	-0.887
1974	3	8	33	5.0	227	1.902	-1.572
1974	3	25	200	3.3	240	-1.416	-5.108
1974	3	26	46	4.2	124	2.060	-1.775
1974	3	28	224	3.1	297	-2.151	-6.038
1974	4	7	44	4.8	296	0.941	-2.629
1974	4	26	80	5.0	204	2.016	-1.317
1974	4	29	132	3.9	156	0.538	-2.892
1974	5	3	153	4.6	241	0.759	-2.518
1974	5	5	152	4.2	191	0.548	-2.761
1974	5	11	38	4.7	160	2.275	-1.350
1974	5	13	208	5.5	237	1.861	-0.677
1974	5	13	227	4.0	255	-0.587	-3.856
1974	5	16	243	4.5	233	0.198	-2.636
1974	5	17	208	5.3	239	1.549	-1.097
1974	5	20	33	4.9	271	1.320	-2.207
1974	5	20	238	4.0	227	-0.494	-3.572
1974	5	31	239	4.3	244	-0.138	-3.148
1974	6	3	100	5.3	278	1.723	-1.471
1974	6	6	214	5.3	231	1.564	-1.015
1974	6	10	188	3.9	265	-0.614	-4.151
1974	6	12	109	4.5	269	0.567	-2.959
1974	6	13	223	4.1	250	-0.390	-3.607
1974	6	14	193	3.9	285	-0.757	-4.334
1974	6	14	231	3.5	249	-1.324	-4.798
1974	6	24	145	4.8	295	0.707	-2.621
1974	6	26	139	3.7	218	-0.345	-4.075
1974	7	4	202	4.6	230	0.555	-2.404
1974	7	8	228	3.6	244	-1.132	-4.548
1974	7	14	118	4.4	198	0.990	-2.446
1974	7	15	117	4.4	223	0.770	-2.730
1974	7	30	211	7.4	227	4.754	3.228
1974	7	30	233	4.3	234	-0.054	-3.046
1974	7	30	70	5.3	133	3.397	0.269
1974	8	4	28	4.4	67	3.796	-0.125
1974	8	4	286	4.3	279	-0.529	-3.480
1974	8	7	144	4.8	202	1.408	-1.693
1974	8	9	139	4.6	198	1.170	-2.046
1974	8	13	155	4.7	254	0.805	-2.447
1974	8	22	109	5.0	202	1.900	-1.293
1974	8	29	228	5.0	240	0.990	-1.708
1974	9	5	173	5.6	240	2.170	-0.508
1974	9	12	226	3.6	244	-1.122	-4.548
1974	9	13	212	4.5	223	0.422	-2.530
1974	9	15	231	4.3	235	-0.049	-3.056
1974	10	3	198	5.0	239	1.150	-1.697
1974	10	17	211	4.4	239	0.184	-2.897
1974	10	19	171	3.9	237	-0.350	-3.877
1974	11	30	195	4.5	241	0.403	-2.718
1974	12	1	210	4.6	246	0.448	-2.568
1974	12	8	226	4.3	238	-0.039	-3.087
1974	12	10	204	5.5	246	1.828	-0.768
1974	12	24	206	4.6	242	0.491	-2.528
1974	12	28	22	6.2	161	4.555	1.635
1974	12	28	33	5.0	169	2.612	-0.876
1974	12	28	33	5.0	167	2.640	-0.849
1974	12	28	33	5.0	176	2.515	-0.970
1974	12	30	116	5.3	233	2.038	-1.036
1974	12	30	40	4.9	263	1.384	-2.133
1975	1	16	202	3.8	248	-0.725	-4.188
1975	1	20	33	4.8	180	2.161	-1.422
1975	2	1	70	4.9	234	1.596	-1.846
1975	2	5	158	4.7	294	0.519	-2.812
1975	2	9	208	4.3	228	0.114	-2.983
1975	2	9	241	4.3	251	-0.184	-3.217
1975	2	11	158	4.4	223	0.567	-2.730
1975	2	17	203	4.3	259	-0.045	-3.395
1975	2	20	182	4.5	280	0.218	-3.089
1975	2	27	212	3.7	242	-0.889	-4.328
1975	2	28	200	5.3	240	1.584	-1.108

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1975	3	3	201	5.3	228	1.652	-0.983
1975	3	4	90	4.9	214	1.722	-1.631
1975	3	28	222	4.8	229	0.783	-1.994
1975	4	6	218	4.5	250	0.235	-2.807
1975	4	6	148	4.8	153	1.787	-1.048
1975	4	7	37	5.0	170	2.586	-0.890
1975	4	9	131	4.5	214	0.929	-2.431
1975	4	14	68	4.3	267	0.397	-3.370
1975	4	14	229	4.8	248	0.641	-2.188
1975	4	15	117	4.6	194	1.333	-1.998
1975	4	23	79	4.8	242	1.343	-2.128
1975	4	24	148	4.9	279	0.957	-2.280
1975	5	1	120	4.2	225	0.439	-3.151
1975	5	2	236	4.2	228	-0.188	-3.183
1975	5	7	45	4.1	239	0.407	-3.497
1975	5	9	257	3.0	175	-1.854	-4.957
1975	5	10	33	4.5	169	1.862	-1.876
1975	5	13	245	3.8	229	-0.842	-3.994
1975	5	14	171	3.9	240	-0.371	-3.908
1975	5	14	99	5.5	196	2.760	-0.222
1975	5	18	217	4.4	242	0.135	-2.928
1975	5	18	94	4.8	191	1.787	-1.561
1975	5	25	177	3.4	253	-1.237	-5.037
1975	5	28	98	4.3	251	0.452	-3.217
1975	5	28	255	4.7	228	0.458	-2.183
1975	6	5	110	4.5	215	1.024	-2.442
1975	6	9	202	4.7	253	0.595	-2.437
1975	6	10	33	3.8	272	-0.339	-4.416
1975	6	15	196	4.3	236	0.129	-3.067
1975	6	23	161	3.7	190	-0.252	-3.749
1975	6	27	225	4.7	238	0.566	-2.287
1975	6	28	217	4.9	256	0.806	-2.066
1975	7	3	109	4.8	208	1.544	-1.763
1975	7	4	202	3.2	294	-1.896	-5.812
1975	7	7	165	3.1	254	-1.639	-5.647
1975	7	20	105	4.5	242	0.805	-2.728
1975	7	23	234	3.1	233	-1.854	-5.436
1975	8	4	166	3.4	241	-1.103	-4.918
1975	8	6	226	4.2	249	-0.249	-3.398
1975	8	19	113	4.6	245	0.899	-2.558
1975	8	19	182	4.4	153	0.913	-1.848
1975	8	24	217	4.2	248	-0.199	-3.388
1975	8	27	109	4.7	224	1.247	-2.140
1975	9	14	96	4.4	245	0.661	-2.958
1975	9	21	201	4.6	246	0.492	-2.568
1975	9	26	219	3.9	205	-0.415	-3.528
1975	10	1	125	4.4	199	0.942	-2.458
1975	10	6	230	3.9	236	-0.649	-3.867
1975	10	12	165	3.3	171	-0.736	-4.303
1975	10	17	33	4.3	254	0.578	-3.247
1975	10	20	198	3.6	238	-0.943	-4.487
1975	10	21	47	3.9	289	-0.355	-4.369
1975	10	23	230	4.4	239	0.085	-2.897
1975	10	25	82	4.9	192	1.985	-1.373
1975	11	11	212	3.5	260	-1.293	-4.904
1975	11	11	186	3.1	213	-1.468	-5.219
1975	11	16	128	4.4	231	0.652	-2.815
1975	11	19	238	4.0	238	-0.552	-3.687
1975	11	26	214	3.6	232	-0.991	-4.425
1975	12	2	205	4.4	243	0.191	-2.938
1975	12	20	198	3.5	271	-1.294	-5.007
1975	12	27	237	4.4	284	-0.187	-3.325
1975	12	27	156	4.8	259	0.916	-2.295
1975	12	30	220	4.8	227	0.805	-1.972
1975	12	30	95	4.5	194	1.301	-2.198
1976	1	2	93	5.0	225	1.754	-1.551
1976	1	8	116	4.8	224	1.366	-1.940
1976	1	9	148	4.0	184	0.330	-3.074
1976	1	11	184	4.7	256	0.661	-2.466
1976	1	23	92	5.1	197	2.185	-1.034
1976	1	29	221	4.0	227	-0.401	-3.572
1976	1	30	190	4.9	240	1.035	-1.908
1976	1	31	223	3.4	250	-1.440	-5.007
1976	2	3	211	4.1	168	0.150	-2.662
1976	2	6	185	4.3	256	0.057	-3.266
1976	2	9	136	3.8	202	-0.046	-3.693
1976	2	12	171	3.5	240	-0.971	-4.709
1976	2	12	246	3.4	248	-1.544	-4.988
1976	2	13	169	3.1	202	-1.291	-5.093
1976	2	14	216	3.9	258	-0.701	-4.085
1976	2	16	190	4.0	230	-0.251	-3.601
1976	2	22	151	3.2	295	-1.713	-5.824
1976	2	23	139	4.1	243	0.057	-3.538
1976	2	26	199	4.5	224	0.488	-2.540
1976	2	26	191	4.8	241	0.873	-2.118
1976	3	3	163	4.4	236	0.447	-2.867
1976	3	3	219	3.2	236	-1.641	-5.267
1976	3	12	162	4.7	237	0.895	-2.277
1976	3	18	148	3.5	248	-0.920	-4.788
1976	3	20	243	4.2	234	-0.257	-3.246
1976	3	22	65	4.9	245	1.504	-1.958
1976	3	22	105	4.3	236	0.557	-3.067
1976	3	22	182	3.8	248	-0.627	-4.188
1976	3	23	215	3.2	234	-1.608	-5.246
1976	3	24	230	4.7	261	0.416	-2.514
1976	3	26	235	3.5	239	-1.291	-4.697
1976	3	31	106	5.0	218	1.765	-1.475
1976	4	1	226	4.5	255	0.168	-2.856
1976	4	11	267	3.6	263	-1.419	-4.733
1976	4	12	184	4.1	220	-0.003	-3.297
1976	4	19	223	4.6	247	0.377	-2.578
1976	4	24	39	4.1	188	0.993	-2.924
1976	5	5	150	4.8	235	1.117	-2.056
1976	5	7	91	4.4	237	0.750	-2.877
1976	5	12	186	4.1	240	-0.145	-3.508
1976	5	12	213	3.9	223	-0.484	-3.730
1976	5	14	133	4.4	191	0.966	-2.361
1976	5	18	218	3.2	239	-1.653	-5.297
1976	5	27	189	3.5	257	-1.168	-4.876
1976	6	5	95	3.9	214	0.201	-3.631
1976	6	6	223	4.0	243	-0.501	-3.738
1976	6	7	225	4.4	237	0.122	-2.877
1976	6	14	192	3.4	260	-1.351	-5.104
1976	6	16	172	4.8	277	0.728	-2.462
1976	6	16	215	4.5	227	0.382	-2.572
1976	6	19	98	4.3	206	0.866	-2.740
1976	7	9	139	3.6	208	-0.413	-4.163
1976	7	10	210	3.2	237	-1.599	-5.277
1976	7	16	156	3.3	257	-1.320	-5.276
1976	7	21	255	4.4	229	0.003	-2.794
1976	7	24	212	4.8	238	0.784	-2.087
1976	7	26	199	4.1	234	-0.174	-3.446
1976	7	28	252	3.7	227	-1.021	-4.172
1976	7	29	217	3.8	286	-1.012	-4.542
1976	7	29	227	3.3	229	-1.495	-4.994
1976	8	1	147	4.6	289	0.442	-2.969
1976	8	5	204	4.5	243	0.346	-2.738
1976	8	7	215	3.8	238	-0.731	-4.087
1976	8	7	104	4.5	211	1.090	-2.397
1976	8	9	209	3.0	235	-1.882	-5.656
1976	8	11	236	4.3	241	-0.107	-3.118
1976	8	13	208	3.2	224	-1.512	-5.140
1976	8	14	241	4.1	233	-0.391	-3.436
1976	8	14	166	3.7	247	-0.695	-4.378

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1976	8	24	33	4.3	293	0.228	-3.604
1976	8	29	196	3.5	248	-1.145	-4.788
1976	9	1	203	3.7	234	-0.795	-4.246
1976	9	1	110	5.0	205	1.867	-1.328
1976	9	23	199	3.8	245	-0.691	-4.158
1976	9	27	176	4.0	133	0.499	-2.331
1976	9	27	182	3.8	252	-0.653	-4.227
1976	9	29	193	4.4	297	-0.079	-3.438
1976	10	3	50	5.1	263	1.668	-1.733
1976	10	6	52	4.6	123	2.636	-0.957
1976	10	11	108	4.6	204	1.287	-2.117
1976	10	12	221	4.9	261	0.759	-2.114
1976	10	13	104	5.0	176	2.188	-0.970
1976	10	17	211	4.6	232	0.525	-2.425
1976	10	23	264	4.7	193	0.570	-1.786
1976	10	29	154	4.7	232	0.970	-2.225
1976	10	29	226	4.4	246	0.067	-2.968
1976	11	10	208	4.7	248	0.596	-2.388
1976	11	17	233	5.4	235	1.591	-0.856
1976	11	20	36	4.8	288	1.017	-2.560
1976	11	24	261	4.5	201	0.252	-2.282
1976	11	27	111	4.9	205	1.712	-1.528
1976	11	27	190	6.1	240	2.835	0.492
1976	12	15	222	4.1	113	0.347	-1.769
1976	12	28	223	4.7	254	0.488	-2.447
1977	1	7	46	5.1	39	5.271	1.642
1977	1	14	149	4.8	250	1.011	-2.207
1977	1	16	89	5.0	180	2.232	-1.022
1977	1	16	49	4.4	286	0.418	-3.342
1977	1	23	218	4.7	246	0.558	-2.368
1977	1	25	33	4.7	283	0.913	-2.716
1977	2	6	187	4.8	255	0.804	-2.256
1977	2	9	220	4.6	240	0.431	-2.508
1977	2	12	98	5.4	292	1.769	-1.395
1977	2	14	33	5.2	196	2.557	-0.822
1977	3	4	50	5.0	281	1.359	-2.098
1977	3	12	201	4.7	244	0.655	-2.348
1977	3	14	70	4.6	274	0.782	-2.835
1977	3	21	123	4.9	235	1.391	-1.856
1977	3	31	129	4.6	243	0.850	-2.538
1977	3	31	131	4.5	233	0.772	-2.636
1977	4	2	222	5.3	241	1.465	-1.118
1977	4	4	204	4.4	253	0.136	-3.037
1977	4	8	243	4.8	251	0.556	-2.217
1977	4	9	4	4.7	270	1.047	-2.598
1977	4	13	196	5.3	237	1.623	-1.077
1977	4	18	217	5.4	238	1.658	-0.887
1977	4	23	274	4.7	228	0.356	-2.183
1977	5	4	122	5.3	286	1.596	-1.542
1977	5	6	237	4.6	251	0.285	-2.617
1977	5	16	101	4.6	152	1.868	-1.433
1977	5	17	116	5.0	230	1.614	-1.601
1977	5	22	196	4.2	259	-0.163	-3.495
1977	5	26	121	4.4	197	0.983	-2.434
1977	5	31	139	4.7	264	0.799	-2.542
1977	6	3	210	5.5	236	1.856	-0.667
1977	6	4	193	3.9	261	-0.611	-4.114
1977	6	13	121	5.0	230	1.592	-1.604
1977	6	20	111	4.7	208	1.384	-1.963
1977	6	20	158	4.8	172	1.557	-1.317
1977	6	21	143	4.7	231	1.032	-2.215
1977	6	24	209	4.7	247	0.597	-2.378
1977	7	1	44	4.9	78	4.052	0.410
1977	7	1	257	4.7	229	0.443	-2.194
1977	7	4	231	4.7	246	0.492	-2.368
1977	7	7	236	4.4	222	0.143	-2.719
1977	7	8	212	4.9	251	0.859	-2.017
1977	7	11	124	4.9	231	1.420	-1.815
1977	7	12	207	4.6	244	0.475	-2.548
1977	7	18	69	5.2	160	2.882	-0.350
1977	8	22	100	4.9	259	1.278	-2.095
1977	8	25	235	4.5	227	0.272	-2.572
1977	8	26	186	4.7	350	0.691	-2.407
1977	8	31	56	4.9	224	1.736	-1.740
1977	9	6	44	4.4	237	0.879	-2.877
1977	9	9	97	5.1	242	1.734	-1.528
1977	9	15	158	4.6	112	1.721	-0.749
1977	9	16	200	4.6	240	0.534	-2.508
1977	9	25	200	4.7	253	0.605	-2.437
1977	9	28	112	4.7	235	1.138	-2.256
1977	10	1	159	4.5	237	0.609	-2.677
1977	10	4	118	4.7	237	1.096	-2.277
1977	10	6	73	4.4	299	0.271	-3.455
1977	10	12	76	4.5	261	0.730	-2.914
1977	10	16	257	4.4	236	-0.041	-2.867
1977	10	19	233	4.5	231	0.262	-2.615
1977	11	6	163	4.5	218	0.727	-2.475
1977	11	19	97	4.8	232	1.374	-2.025
1977	11	21	255	4.4	256	-0.128	-3.066
1977	11	22	230	3.6	218	-1.001	-4.275
1977	11	22	120	4.9	236	1.396	-1.867
1977	12	3	152	4.2	264	-0.003	-3.542
1977	12	8	239	4.0	222	-0.473	-3.519
1977	12	15	77	4.5	243	0.890	-2.738
1977	12	21	195	4.3	234	0.147	-3.046
1978	1	5	158	4.5	260	0.450	-2.904
1978	1	7	143	4.0	271	-0.318	-4.007
1978	1	16	221	5.3	233	1.515	-1.036
1978	1	21	209	4.0	229	-0.347	-3.594
1978	1	27	93	4.5	138	1.946	-1.414
1978	1	29	142	4.0	195	0.277	-3.210
1978	2	4	134	4.0	111	1.086	-1.929
1978	2	7	236	4.5	228	0.262	-2.583
1978	2	11	122	5.0	235	1.546	-1.656
1978	2	13	88	4.5	298	0.398	-3.247
1978	2	13	111	4.7	207	1.393	-1.951
1978	2	15	216	4.5	231	0.354	-2.615
1978	2	17	210	4.9	245	0.904	-1.958
1978	2	17	119	5.0	219	1.696	-1.486
1978	3	7	33	3.6	253	-0.462	-4.637
1978	3	11	147	4.3	82	1.618	-2.652
1978	3	21	123	4.0	198	0.362	-3.246
1978	3	27	200	3.6	215	-0.812	-4.242
1978	3	27	111	4.2	207	0.643	-2.951
1978	4	4	133	4.9	233	1.363	-1.836
1978	4	5	234	4.2	230	-0.188	-3.204
1978	4	9	197	3.5	253	-1.181	-4.837
1978	4	21	227	5.9	251	2.285	-0.017
1978	4	21	254	4.8	232	0.594	-2.025
1978	4	23	221	4.1	214	-0.178	-3.231
1978	4	24	175	4.0	251	-0.314	-3.817
1978	4	27	33	5.0	169	2.612	-0.876
1978	4	30	188	4.1	278	-0.394	-3.871
1978	5	3	224	4.2	257	-0.283	-3.476
1978	5	7	27	5.0	227	1.911	-1.572
1978	5	18	230	4.2	218	-0.101	-3.075
1978	5	24	89	4.7	241	1.171	-2.318
1978	5	26	66	4.0	239	0.209	-3.697
1978	5	31	213	3.2	257	-1.731	-5.476
1978	5	31	109	4.4	224	0.797	-2.740
1978	6	5	153	4.5	274	0.373	-3.035
1978	6	6	213	4.2	251	-0.196	-3.417
1978	6	10	178	4.3	257	0.082	-3.276
1978	6	13	200	4.5	238	0.396	-2.687

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1978	6	16	82	4.5	273	0.612	-3.026
1978	6	20	78	4.6	190	1.576	-1.949
1978	6	22	77	4.4	221	0.952	-2.708
1978	6	28	171	4.0	198	0.075	-3.246
1978	7	2	203	4.6	242	0.507	-2.528
1978	7	10	219	4.6	226	0.516	-2.362
1978	7	12	51	4.2	175	1.271	-2.557
1978	7	21	196	3.3	227	-1.314	-4.972
1978	7	23	133	3.8	215	-0.139	-3.842
1978	7	26	245	3.2	230	-1.748	-5.204
1978	8	1	96	5.2	203	2.255	-0.905
1978	8	3	251	4.4	233	0.005	-2.836
1978	8	6	108	4.4	242	0.644	-2.928
1978	8	8	220	5.2	249	1.281	-1.398
1978	8	11	94	4.7	208	1.464	-1.963
1978	8	13	139	4.1	200	0.403	-3.070
1978	8	13	134	3.8	199	-0.009	-3.658
1978	8	17	139	3.7	286	-0.860	-4.742
1978	8	20	101	4.5	207	1.142	-2.351
1978	8	21	197	3.5	178	-0.711	-3.996
1978	8	25	138	4.4	225	0.653	-2.751
1978	8	27	204	4.0	246	-0.422	-3.768
1978	8	29	138	4.0	153	0.668	-2.648
1978	9	9	.116	4.8	242	1.212	-2.128
1978	9	11	217	4.0	234	-0.419	-3.646
1978	9	11	277	3.4	225	-1.597	-4.751
1978	9	14	210	3.5	229	-1.102	-4.594
1978	9	25	127	3.9	274	-0.432	-4.235
1978	9	28	202	4.5	231	0.429	-2.615
1978	10	17	207	4.1	164	0.202	-2.607
1978	10	22	142	4.5	204	0.953	-2.317
1978	10	23	185	5.6	238	2.123	-0.487
1978	10	28	191	4.6	260	0.454	-2.704
1978	11	4	196	3.6	178	-0.554	-3.796
1978	11	11	223	3.8	240	-0.784	-4.108
1978	11	13	202	5.0	241	1.118	-1.718
1978	11	18	40	4.9	207	1.961	-1.551
1978	11	21	173	4.2	144	0.749	-2.110
1978	11	30	192	4.2	286	-0.309	-3.742
1978	12	11	143	4.8	230	1.189	-2.004
1979	1	8	111	4.2	270	0.103	-3.598
1979	1	16	217	4.3	247	-0.043	-3.178
1979	1	24	259	4.0	225	-0.599	-3.551
1979	1	26	33	4.3	217	0.961	-2.864
1979	2	7	123	5.2	236	1.833	-1.267
1979	2	15	235	4.2	238	-0.236	-3.287
1979	2	25	211	4.0	256	-0.515	-3.866
1979	3	2	101	4.9	194	1.870	-1.398
1979	3	4	42	4.7	175	2.053	-1.557
1979	3	13	72	4.8	143	2.491	-0.894
1979	3	17	33	4.4	231	0.960	-2.815
1979	3	22	205	4.6	234	0.545	-2.446
1979	3	23	215	4.2	246	-0.177	-3.368
1979	4	29	95	4.7	137	2.241	-0.995
1979	4	30	130	4.7	232	1.085	-2.225
1979	5	2	204	3.9	245	-0.566	-3.958
1979	5	5	232	4.1	227	-0.311	-3.372
1979	5	7	227	4.7	238	0.556	-2.287
1979	5	21	200	4.6	233	0.577	-2.436
1979	5	24	222	4.3	275	-0.223	-3.444
1979	6	17	75	4.4	252	0.663	-3.027
1979	6	20	206	5.3	239	1.559	-1.097
1979	6	26	229	5.7	235	2.062	-0.256
1979	7	2	106	4.5	273	0.545	-3.026
1979	7	10	16	4.3	141	2.038	-1.863
1979	7	11	101	4.3	195	0.960	-2.610
1979	7	18	209	4.3	240	0.038	-3.108
1979	7	18	171	4.5	252	0.418	-2.827
1979	7	19	228	4.3	238	-0.049	-3.087
1979	7	21	234	4.9	245	0.782	-1.958
1979	7	29	90	4.3	215	0.812	-2.842
1979	8	8	204	4.5	249	0.310	-2.798
1979	8	12	224	4.6	250	0.355	-2.607
1979	8	14	121	4.7	292	0.655	-2.795
1979	8	14	260	4.0	221	-0.586	-3.508
1979	8	14	196	5.1	243	1.286	-1.538
1979	8	15	238	3.9	201	-0.509	-3.482
1979	8	18	195	4.1	249	-0.246	-3.598
1979	8	20	229	6.1	259	2.532	0.305
1979	8	24	149	4.6	233	0.837	-2.436
1979	8	29	101	4.8	290	0.877	-2.578
1979	8	29	239	4.0	203	-0.375	-3.305
1979	9	8	209	3.8	237	-0.694	-4.077
1979	9	14	122	4.5	204	1.064	-2.317
1979	9	13	230	3.9	262	-0.789	-4.123
1979	9	18	124	4.2	248	0.231	-3.388
1979	9	24	222	5.3	259	1.365	-1.295
1979	9	30	141	4.6	219	0.986	-2.286
1979	10	16	246	4.0	234	-0.573	-3.646
1979	10	19	294	4.4	244	-0.267	-2.945
1979	10	20	203	4.7	242	0.657	-2.328
1979	10	22	90	4.5	278	0.551	-3.071
1979	10	23	212	4.7	254	0.541	-2.447
1979	10	26	204	4.7	250	0.604	-2.407
1979	10	26	197	4.7	241	0.693	-2.318
1979	11	10	243	4.0	134	-0.071	-2.348
1979	11	14	260	4.1	228	-0.469	-3.383
1979	11	19	201	4.7	229	0.746	-2.194
1979	11	23	252	3.8	184	-0.663	-3.474
1979	12	1	72	4.8	219	1.590	-1.886
1979	12	9	246	4.1	261	-0.560	-3.714
1979	12	12	72	5.0	297	1.189	-2.238
1979	12	20	237	4.3	196	0.123	-2.622
1979	12	24	142	4.4	276	0.250	-3.253
1980	1	8	211	4.6	230	0.536	-2.404
1980	1	15	98	4.9	215	1.679	-1.642
1980	1	17	20	4.7	77	4.032	0.280
1980	2	1	93	5.0	275	1.317	-2.044
1980	2	4	89	4.7	283	0.813	-2.716
1980	2	9	33	4.0	209	0.602	-3.374
1980	2	20	236	4.5	244	0.177	-2.748
1980	2	27	129	4.7	206	1.308	-1.940
1980	3	9	136	4.5	269	0.473	-2.989
1980	3	12	52	4.4	244	0.794	-2.948
1980	3	20	141	5.2	222	1.862	-1.119
1980	3	22	207	3.5	296	-1.477	-5.229
1980	3	23	231	3.4	212	-1.275	-4.608
1980	3	25	73	4.5	258	0.764	-2.885
1980	3	25	211	4.3	253	-0.048	-3.237
1980	3	28	216	4.3	230	0.059	-3.004
1980	3	29	33	4.7	299	0.778	-2.855
1980	3	29	33	4.2	219	0.789	-3.086
1980	4	11	33	3.8	277	-0.384	-4.462
1980	4	14	61	5.3	269	1.894	-1.389
1980	4	14	42	5.0	291	1.285	-2.186
1980	4	18	176	3.9	215	-0.224	-3.642
1980	4	21	94	4.2	223	0.569	-3.130
1980	4	23	138	3.8	240	-0.365	-4.108
1980	5	1	57	4.9	275	1.249	-2.244
1980	5	14	223	4.5	250	0.210	-2.807
1980	5	14	162	4.1	218	0.132	-3.275
1980	5	15	168	3.7	278	-0.913	-4.671
1980	5	17	55	4.4	295	0.334	-3.421
1980	5	18	219	4.4	240	0.136	-2.908

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1980	5	19	33	4.5	294	0.520	-3.212
1980	5	19	208	3.9	243	-0.575	-3.938
1980	5	25	163	4.0	252	-0.266	-3.827
1980	6	3	197	4.2	246	-0.088	-3.368
1980	6	4	238	4.2	243	-0.278	-3.338
1980	6	8	196	4.2	245	-0.077	-3.358
1980	6	11	103	4.8	267	1.052	-2.370
1980	6	13	231	3.9	225	-0.595	-3.751
1980	7	1	207	4.5	239	0.354	-2.697
1980	7	6	119	4.6	221	1.078	-2.308
1980	7	10	33	4.6	168	2.026	-1.662
1980	7	18	182	5.1	249	1.316	-1.598
1980	7	25	139	4.4	232	0.593	-2.825
1980	7	29	117	4.2	209	0.595	-2.974
1980	8	12	265	4.3	259	-0.341	-3.295
1980	8	18	186	5.0	240	1.205	-1.708
1980	9	2	104	4.7	229	1.223	-2.194
1980	9	4	105	4.9	216	1.638	-1.653
1980	9	19	152	4.2	204	0.445	-2.917
1980	9	19	210	5.4	238	1.695	-0.887
1980	10	5	33	4.2	277	0.216	-3.662
1980	10	12	106	4.3	184	1.043	-2.474
1980	10	18	107	4.5	213	1.057	-2.419
1980	10	29	134	4.8	282	0.836	-2.507
1980	11	12	100	4.8	179	1.850	-1.409
1980	11	29	257	4.2	211	-0.221	-2.997
1980	12	18	265	3.9	237	-0.838	-3.877
1981	1	5	131	4.8	227	1.271	-1.972
1981	1	8	84	4.6	293	0.595	-3.004
1981	1	10	137	5.5	223	2.325	-0.530
1981	1	16	93	4.6	186	1.545	-1.899
1981	1	30	295	3.4	220	-1.674	-4.697
1981	1	31	76	4.6	164	1.892	-1.607
1981	2	12	72	4.2	220	0.679	-3.097
1981	2	16	247	4.8	229	0.647	-1.994
1981	2	18	33	4.7	127	2.829	-0.828
1981	2	23	159	4.3	217	0.456	-2.864
1981	2	27	232	4.7	234	0.551	-2.246
1981	3	2	72	4.7	251	1.130	-2.417
1981	3	4	112	4.9	217	1.597	-1.664
1981	3	23	222	4.9	253	0.798	-2.037
1981	3	31	204	4.0	251	-0.452	-3.817
1981	4	1	191	4.2	240	-0.020	-3.308
1981	4	9	94	4.5	153	1.758	-1.648
1981	4	9	187	4.4	246	0.261	-2.968
1981	4	17	142	4.4	194	0.885	-2.398
1981	4	21	207	4.9	236	0.972	-1.867
1981	4	21	226	4.7	242	0.539	-2.328
1981	4	28	197	5.2	232	1.499	-1.225
1981	5	2	229	6.3	223	3.027	1.070
1981	6	7	208	4.6	234	0.529	-2.446
1981	7	8	215	5.3	232	1.553	-1.025
1981	7	20	57	4.6	234	1.181	-2.446
1981	7	21	130	4.7	211	1.260	-1.997
1981	8	13	108	4.6	221	1.129	-2.308
1981	8	15	199	4.3	237	0.108	-3.077
1981	8	16	117	4.7	230	1.160	-2.204
1981	8	23	231	4.4	235	0.101	-2.856
1981	9	1	92	4.6	235	1.065	-2.456
1981	9	4	103	5.0	157	2.393	-0.707
1981	9	12	33	6.2	254	3.428	0.553
1981	9	12	33	4.3	272	0.411	-3.416
1981	9	12	33	4.6	263	0.943	-2.733
1981	9	12	33	4.1	277	0.066	-3.862
1981	9	12	175	4.1	286	-0.392	-3.942
1981	9	12	33	4.8	268	1.197	-2.379
1981	9	13	33	4.8	274	1.143	-2.435
1981	9	15	33	4.4	281	0.481	-3.295
1981	9	16	33	4.6	275	0.834	-2.844
1981	9	18	58	5.1	248	1.792	-1.588
1981	9	21	102	4.5	193	1.275	-2.186
1981	10	12	107	4.4	207	0.963	-2.551
1981	11	1	208	5.1	239	1.249	-1.497
1981	11	7	141	4.5	287	0.326	-3.151
1981	11	9	73	4.9	256	1.382	-2.066
1981	11	10	49	4.7	256	1.135	-2.466
1981	11	23	229	5.0	238	0.996	-1.687
1981	12	4	33	4.8	192	2.007	-1.573
1981	12	5	71	4.6	244	1.048	-2.548
1981	12	8	174	4.5	276	0.276	-3.053
1981	12	15	92	4.5	213	1.124	-2.419
1981	12	17	136	4.7	231	1.065	-2.215
1981	12	21	246	4.3	283	-0.371	-3.516
1982	1	9	235	4.4	244	0.032	-2.948
1982	1	12	33	4.4	252	0.747	-3.027
1982	1	28	107	4.4	292	0.245	-3.395
1982	1	30	33	4.7	248	1.237	-2.388
1982	2	12	234	4.8	249	0.611	-2.198
1982	2	18	192	4.5	270	0.238	-2.998
1982	2	22	33	5.4	260	2.171	-1.104
1982	2	27	288	4.6	248	0.046	-2.588
1982	4	10	179	4.2	248	-0.013	-3.388
1982	4	11	197	4.8	232	0.899	-2.025
1982	4	26	118	4.3	234	0.521	-3.046
1982	5	14	58	4.6	258	0.949	-2.685
1982	5	15	33	4.5	235	1.068	-2.656
1982	5	18	217	4.5	233	0.337	-2.636
1982	5	25	95	4.7	219	1.353	-2.086
1982	5	28	33	4.6	261	0.962	-2.714
1982	6	6	218	4.1	259	-0.416	-3.695
1982	6	21	219	4.4	231	0.188	-2.815
1982	6	24	33	5.0	143	3.005	-0.494
1982	6	25	104	4.6	233	1.038	-2.436
1982	6	28	93	4.7	179	1.771	-1.609
1982	7	1	84	5.2	259	1.776	-1.495
1982	7	2	231	5.2	257	1.183	-1.476
1982	7	14	33	4.0	251	0.157	-3.817
1982	7	18	281	4.3	188	-0.113	-2.524
1982	7	21	33	4.6	84	3.584	-0.208
1982	7	25	33	4.4	280	0.490	-3.289
1982	8	3	123	4.1	255	0.029	-3.656
1982	8	7	138	4.8	225	1.253	-1.951
1982	8	12	219	4.5	235	0.315	-2.656
1982	8	12	22	4.8	254	1.340	-2.247
1982	8	19	215	4.1	264	-0.430	-3.742
1982	8	28	206	4.7	237	0.671	-2.277
1982	9	2	210	4.9	246	0.898	-1.968
1982	9	15	63	4.1	289	-0.080	-3.969
1982	9	22	85	4.9	223	1.654	-1.730
1982	10	16	220	4.6	241	0.426	-2.518
1982	10	19	130	4.4	210	0.819	-2.586
1982	10	20	222	4.0	246	-0.513	-3.768
1982	10	27	108	4.3	218	0.706	-2.875
1982	10	27	40	4.8	284	1.047	-2.525
1982	11	8	106	4.7	207	1.418	-1.951
1982	11	13	33	4.8	270	1.179	-2.398
1982	11	14	94	4.6	254	0.889	-2.647
1982	11	20	25	5.7	79	5.436	2.190
1982	11	25	109	4.4	274	0.378	-3.235
1982	11	27	174	4.1	250	-0.153	-3.607
1982	11	29	115	4.5	237	0.803	-2.677
1982	12	1	36	4.7	266	1.062	-2.561
1982	12	9	116	4.4	162	1.351	-1.979
1982	12	11	209	3.7	275	-1.066	-4.644

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1982	12	16	36	6.9	290	4.150	1.622
1982	12	16	36	4.9	285	1.193	-2.334
1982	12	16	33	4.9	298	1.086	-2.447
1982	12	25	83	4.7	221	1.381	-2.108
1982	12	28	33	4.1	297	-0.105	-4.038
1983	1	8	202	4.9	236	0.998	-1.867
1983	1	13	33	4.4	283	0.463	-3.316
1983	1	13	224	4.3	213	0.111	-2.819
1983	1	14	219	4.4	249	0.086	-2.998
1983	1	18	67	4.8	179	2.054	-1.409
1983	1	24	173	4.6	246	0.629	-2.568
1983	1	25	184	5.0	233	1.261	-1.636
1983	1	27	54	4.6	235	1.178	-2.456
1983	2	6	73	5.1	299	1.321	-2.055
1983	2	12	227	4.6	247	0.357	-2.578
1983	3	5	85	4.5	218	1.103	-2.475
1983	3	12	220	4.4	238	0.143	-2.887
1983	3	13	33	4.2	281	0.181	-3.698
1983	3	18	197	4.4	252	0.175	-3.027
1983	3	21	152	4.3	251	0.240	-3.217
1983	3	23	116	5.2	296	1.391	-1.829
1983	3	27	159	4.5	264	0.418	-2.942
1983	3	28	26	4.8	148	2.647	-0.972
1983	4	2	220	4.8	230	0.788	-2.004
1983	4	4	33	4.3	299	0.178	-3.655
1983	4	5	33	4.4	263	0.613	-3.133
1983	4	6	98	4.8	232	1.370	-2.025
1983	4	8	233	4.6	240	0.364	-2.508
1983	4	12	175	4.4	271	0.154	-3.207
1983	4	13	48	4.6	247	1.072	-2.578
1983	4	14	214	4.6	226	0.543	-2.362
1983	4	14	34	4.6	276	0.824	-2.853
1983	4	15	176	3.9	248	-0.449	-3.988
1983	4	17	265	4.5	254	-0.018	-2.847
1983	4	21	33	4.4	283	0.463	-3.316
1983	4	25	33	4.4	268	0.597	-3.179
1983	4	27	118	4.7	227	1.181	-2.172
1983	4	28	33	4.8	70	4.247	0.540
1983	4	30	64	4.6	211	1.400	-2.197
1983	5	8	141	4.6	215	1.019	-2.242
1983	5	8	33	4.9	270	1.329	-2.198
1983	5	10	218	5.1	259	1.084	-1.695
1983	5	14	33	4.7	241	1.306	-2.318
1983	5	28	141	4.5	162	1.315	-1.779
1983	6	13	33	4.4	296	0.353	-3.429
1983	6	17	33	4.6	260	0.971	-2.704
1983	6	19	33	4.8	246	1.406	-2.168
1983	6	21	333	4.1	255	-0.950	-3.656
1983	6	24	33	4.6	126	2.697	-1.010
1983	6	24	219	4.4	247	0.097	-2.978
1983	7	10	208	4.5	246	0.308	-2.768
1983	7	13	33	4.6	274	0.843	-2.835
1983	7	13	102	4.8	230	1.372	-2.004
1983	7	17	196	4.9	234	1.042	-1.846
1983	7	26	33	4.5	280	0.640	-3.089
1983	8	11	104	4.7	280	0.796	-2.689
1983	8	15	134	4.5	237	0.726	-2.677
1983	8	22	33	4.5	214	1.295	-2.431
1983	8	24	33	4.5	224	1.184	-2.540
1983	9	12	208	6.1	239	2.749	0.503
1983	9	20	214	4.8	234	0.797	-2.046
1983	9	23	207	4.8	249	0.745	-2.198
1983	9	28	33	5.0	203	2.173	-1.305
1983	9	29	192	4.9	232	1.076	-1.825
1983	10	2	218	4.7	232	0.637	-2.225
1983	10	9	235	4.3	225	-0.017	-2.951
1983	10	30	131	5.6	230	2.416	-0.404

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1983	11	22	199	5.1	229	1.357	-1.394
1983	11	24	75	5.2	215	2.220	-1.042
1983	12	7	115	4.9	186	1.871	-1.299
1983	12	7	48	5.4	279	1.979	-1.280
1983	12	10	210	4.2	259	-0.228	-3.495
1983	12	15	179	4.5	285	0.199	-3.134
1983	12	22	33	5.6	271	2.370	-0.807
1983	12	25	267	4.5	289	-0.191	-3.169
1983	12	30	214	7.2	230	4.420	2.796
1983	12	31	205	4.5	250	0.299	-2.807
1983	12	31	215	4.9	243	0.890	-1.938
1983	12	31	213	4.8	247	0.727	-2.178
1983	12	31	156	4.6	270	0.539	-2.798
1983	12	31	147	4.6	279	0.511	-2.880
1983	12	31	172	4.3	263	0.069	-3.333
1983	12	31	184	4.8	255	0.818	-2.256
1983	12	31	33	3.5	125	1.065	-3.192
1984	1	1	192	4.4	245	0.243	-2.958
1984	1	1	151	4.9	298	0.817	-2.447
1984	1	2	204	5.0	240	1.114	-1.708
1984	1	3	204	5.1	239	1.270	-1.497
1984	1	5	213	4.9	242	0.906	-1.928
1984	1	11	33	4.6	243	1.136	-2.538
1984	1	12	33	4.3	257	0.549	-3.276
1984	1	13	144	4.7	223	1.089	-2.130
1984	1	18	225	4.4	250	0.050	-3.007
1984	1	18	33	5.3	159	3.206	-0.136
1984	1	19	33	4.9	283	1.213	-2.316
1984	1	22	33	4.7	229	1.431	-2.194
1984	1	25	58	4.8	225	1.570	-1.951
1984	1	27	171	5.8	227	2.570	0.028
1984	1	27	54	4.4	196	1.301	-2.422
1984	1	28	33	5.3	279	1.848	-1.480
1984	1	28	33	4.7	275	0.934	-2.644
1984	1	29	91	4.8	218	1.529	-1.875
1984	2	1	33	5.9	83	5.558	2.417
1984	2	1	33	4.9	61	4.652	0.969
1984	2	2	39	5.0	95	3.874	0.272
1984	2	3	33	4.9	85	4.009	0.368
1984	2	6	33	4.7	265	1.074	-2.551
1984	2	9	73	4.8	226	1.516	-1.962
1984	2	11	33	4.5	73	3.716	-0.135
1984	2	11	33	4.9	101	3.642	0.078
1984	2	12	33	4.7	66	4.208	0.442
1984	2	16	207	6.1	235	2.778	0.544
1984	2	18	33	4.8	73	4.166	0.465
1984	2	22	33	4.5	248	0.937	-2.768
1984	2	24	211	5.0	244	1.054	-1.748
1984	2	29	151	4.6	274	0.531	-2.835
1984	3	1	212	4.6	243	0.455	-2.538
1984	3	7	74	5.4	262	2.076	-1.123
1984	3	7	33	4.5	261	0.812	-2.914
1984	3	17	180	4.4	256	0.230	-3.066
1984	3	20	33	3.9	288	-0.330	-4.360
1984	3	20	191	4.7	231	0.787	-2.215
1984	3	21	183	4.4	251	0.248	-3.017
1984	3	22	204	4.5	238	0.376	-2.687
1984	3	22	253	5.3	253	1.246	-1.237
1984	4	10	180	4.4	284	0.051	-3.325
1984	4	11	155	4.3	255	0.198	-3.256
1984	4	19	201	5.7	233	2.222	-0.236
1984	4	19	33	4.5	279	0.648	-3.080
1984	4	21	33	4.3	283	0.313	-3.516
1984	4	21	35	5.1	290	1.451	-1.978
1984	4	22	58	5.1	283	1.479	-1.916
1984	4	23	208	5.3	236	1.567	-1.067
1984	4	24	138	4.5	210	0.926	-2.386

Estimated Earthquake Intensity Felt at Munda Damsite

Year a	Month b	Day c	Focal depth (km) d	Magnitude in Ritcher Scale (M) e	Epicentral distance (km) f	Intensity at Damsite by Cornell Imm g	Intensity at Damsite by Kawasumi Ij h
1984	5	1	237	4.3	223	-0.018	-2.930
1984	5	3	65	4.8	195	1.874	-1.610
1984	5	12	33	4.2	276	0.225	-3.653
1984	5	13	202	4.2	284	-0.338	-3.725
1984	5	17	33	4.8	276	1.125	-2.453
1984	5	17	33	4.4	275	0.534	-3.244
1984	5	30	141	4.2	273	-0.025	-3.626
1984	6	4	33	4.9	170	2.448	-1.090
1984	6	16	33	5.0	76	4.386	0.790
1984	6	16	33	4.7	156	2.351	-1.292
1984	6	17	188	4.8	237	0.914	-2.077
1984	6	18	208	4.8	238	0.805	-2.087
1984	7	1	203	5.8	238	2.331	-0.087
1984	7	3	53	5.2	271	1.741	-1.607
1984	7	14	89	4.7	280	0.837	-2.689
1984	7	28	232	4.8	224	0.755	-1.940
1984	7	30	33	4.8	75	4.113	0.415
1984	8	15	33	4.5	269	0.738	-2.989
1984	8	19	221	4.2	244	-0.196	-3.348
1984	8	22	136	5.4	210	2.286	-0.586
1984	8	31	178	4.8	263	0.793	-2.333
1984	9	14	33	4.7	149	2.459	-1.188
1984	9	16	201	5.0	239	1.135	-1.697
1984	9	22	213	4.9	242	0.906	-1.928
1984	9	24	156	4.4	216	0.630	-2.653
1984	9	28	219	5.0	247	0.997	-1.778
1984	10	1	143	4.3	281	0.061	-3.498
1984	10	6	161	4.6	254	0.629	-2.647
1984	10	6	150	4.4	265	0.298	-3.151
1984	10	16	64	4.7	274	0.944	-2.635
1984	10	17	46	4.4	194	1.349	-2.398
1984	10	22	205	4.3	250	-0.001	-3.207
1984	10	23	33	4.8	78	4.035	0.340
1984	10	24	33	4.6	240	1.166	-2.508
1984	10	25	279	4.7	165	0.592	-1.421
1984	10	25	63	4.8	208	1.736	-1.763
1984	10	26	33	4.7	218	1.550	-2.075
1984	10	31	105	4.7	285	0.754	-2.734
1984	11	4	33	4.4	241	0.856	-2.918
1984	11	12	133	4.4	259	0.409	-3.095
1984	11	13	33	4.5	298	0.486	-3.247
1984	11	14	84	4.6	248	0.973	-2.588
1984	11	17	206	4.2	258	-0.203	-3.455
1984	11	17	197	4.5	244	0.375	-2.748
1984	11	18	150	4.7	249	0.863	-2.398
1984	11	25	70	5.1	215	2.088	-1.242
1984	11	27	197	4.6	251	0.482	-2.617
1984	11	29	225	4.5	261	0.140	-2.914
1984	12	1	228	4.5	241	0.234	-2.718
1984	12	1	33	4.4	248	0.787	-2.988
1984	12	1	205	4.7	236	0.683	-2.267
1984	12	8	173	4.9	233	1.168	-1.836
1984	12	14	33	4.6	274	0.843	-2.835
1984	12	15	199	4.3	230	0.151	-3.004
1984	12	20	33	4.6	198	1.633	-2.046
1984	12	20	154	5.1	218	1.676	-1.275
1984	12	20	242	4.5	248	0.126	-2.788
1984	12	21	203	4.5	250	0.309	-2.807
1984	12	22	199	4.1	238	-0.198	-3.487
1984	12	23	211	4.3	267	-0.129	-3.370
1984	12	27	33	4.5	214	1.295	-2.431
1984	12	28	33	4.6	215	1.434	-2.242
1985	1	2	80	4.7	226	1.342	-2.162
1985	1	7	193	4.2	247	-0.074	-3.378
1985	1	9	44	4.8	175	2.196	-1.357
1985	1	9	111	4.8	203	1.581	-1.705
1985	1	10	187	4.3	245	0.118	-3.158

Year a	Month b	Day c	Focal depth (km) d	Magnitude in Ritcher Scale (M) e	Epicentral distance (km) f	Intensity at Damsite by Cornell Imm g	Intensity at Damsite by Kawasumi Ij h
1985	1	12	158	4.4	267	0.251	-3.170
1985	1	17	200	4.6	229	0.602	-2.394
1985	1	20	189	4.8	233	0.935	-2.036
1985	1	22	33	4.5	298	0.486	-3.247
1985	1	26	180	4.4	261	0.197	-3.114
1985	1	31	192	4.4	261	0.143	-3.114
1985	2	3	33	4.2	289	0.112	-3.769
1985	2	8	96	4.6	211	1.276	-2.197
1985	2	18	109	4.4	156	1.465	-1.892
1985	2	20	93	5.1	179	2.371	-0.809
1985	2	21	33	4.2	207	0.926	-2.951
1985	2	25	228	4.4	234	0.123	-2.846
1985	2	25	33	4.8	284	1.055	-2.525
1985	3	1	33	4.4	258	0.690	-3.055
1985	3	12	84	4.5	229	1.000	-2.594
1985	3	15	205	4.6	240	0.509	-2.503
1985	3	17	54	4.7	210	1.592	-1.986
1985	3	18	33	4.3	232	0.799	-3.025
1985	3	19	98	4.8	188	1.797	-1.524
1985	4	12	33	4.8	260	1.271	-2.304
1985	4	21	100	4.6	196	1.405	-2.022
1985	4	23	33	4.7	231	1.410	-2.215
1985	4	24	211	4.9	230	0.986	-1.804
1985	5	11	33	4.3	220	0.928	-2.897
1985	5	14	33	4.6	284	0.755	-2.925
1985	5	15	109	4.3	270	0.259	-3.398
1985	5	17	33	4.5	284	0.605	-3.125
1985	5	18	33	4.4	249	0.777	-2.995
1985	5	22	183	4.0	242	-0.293	-3.728
1985	5	24	33	5.0	281	1.381	-2.098
1985	5	28	99	4.8	206	1.611	-1.740
1985	5	28	211	4.8	244	0.754	-2.148
1985	5	28	117	5.3	227	2.085	-0.972
1985	6	13	64	4.4	270	0.529	-3.198
1985	6	20	50	4.6	299	0.609	-3.055
1985	6	24	33	4.7	279	0.948	-2.680
1985	6	25	105	4.2	269	0.130	-3.589
1985	6	25	33	4.3	257	0.549	-3.276
1985	6	27	142	4.2	269	0.001	-3.589
1985	6	30	181	4.3	247	0.134	-3.178
1985	7	1	220	4.2	280	-0.392	-3.659
1985	7	8	219	4.9	259	0.779	-2.095
1985	7	15	189	4.7	240	0.740	-2.308
1985	7	15	261	4.1	226	-0.465	-3.362
1985	7	17	190	4.9	281	0.779	-2.298
1985	7	18	180	5.0	241	1.228	-1.718
1985	7	19	33	4.3	245	0.666	-3.158
1985	7	21	33	4.2	286	0.137	-3.742
1985	7	29	98	6.6	207	4.306	1.849
1985	7	29	97	5.2	212	2.162	-1.008
1985	7	29	93	4.5	224	1.014	-2.540
1985	7	29	69	4.6	243	1.063	-2.538
1985	7	29	33	4.4	237	0.897	-2.877
1985	7	29	82	5.0	210	1.945	-1.386
1985	7	29	86	5.1	217	2.009	-1.264
1985	7	29	75	4.3	242	0.605	-3.128
1985	7	29	87	5.1	213	2.044	-1.219
1985	7	29	100	4.4	228	0.799	-2.783
1985	7	29	99	4.6	229	1.094	-2.394
1985	7	29	79	4.9	208	1.828	-1.563
1985	7	29	88	4.4	225	0.873	-2.751
1985	7	29	83	4.6	224	1.201	-2.340
1985	7	29	33	4.3	278	0.357	-3.471
1985	7	30	94	4.7	213	1.415	-2.019
1985	7	30	79	4.6	240	1.062	-2.503
1985	7	30	96	5.0	215	1.837	-1.442
1985	7	30	79	4.6	214	1.316	-2.231

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1985	7	30	69	4.8	214	1.652	-1.831
1985	7	31	69	4.5	218	1.160	-2.475
1985	7	31	56	4.5	216	1.220	-2.453
1985	7	31	33	4.5	284	0.605	-3.125
1985	7	31	33	4.5	170	1.848	-1.890
1985	7	31	33	4.3	228	0.841	-2.983
1985	8	1	73	5.0	215	1.927	-1.412
1985	8	1	108	4.7	208	1.399	-1.963
1985	8	2	90	4.8	186	1.861	-1.499
1985	8	2	120	6.5	208	4.038	1.637
1985	8	2	33	4.5	229	1.131	-2.594
1985	8	3	101	5.1	199	2.120	-1.058
1985	8	4	94	5.0	199	2.005	-1.258
1985	8	4	100	4.4	197	1.095	-2.434
1985	8	5	33	4.7	240	1.316	-2.308
1985	8	5	133	4.6	225	0.978	-2.351
1985	8	5	145	4.6	181	1.275	-1.835
1985	8	6	33	4.5	272	0.711	-3.016
1985	8	6	33	4.6	256	1.009	-2.666
1985	8	7	33	4.4	250	0.767	-3.007
1985	8	11	33	4.5	243	0.986	-2.738
1985	8	12	69	4.2	210	0.794	-2.986
1985	8	13	66	5.1	213	2.122	-1.219
1985	8	14	123	4.3	194	0.849	-2.598
1985	8	15	93	4.6	244	0.980	-2.548
1985	8	18	114	4.5	187	1.267	-2.111
1985	8	19	85	4.5	227	1.015	-2.572
1985	8	19	51	5.2	206	2.395	-0.940
1985	8	20	33	4.4	251	0.757	-3.017
1985	8	21	176	4.4	255	0.255	-3.056
1985	8	22	33	4.7	249	1.227	-2.398
1985	8	22	84	4.8	188	1.870	-1.524
1985	8	24	104	4.5	191	1.284	-2.161
1985	8	24	219	4.3	232	0.032	-3.025
1985	8	25	175	4.1	250	-0.157	-3.607
1985	8	27	33	4.6	231	1.260	-2.415
1985	8	30	111	5.0	215	1.770	-1.442
1985	9	3	33	4.8	238	1.487	-2.087
1985	9	3	80	5.2	188	2.439	-0.724
1985	9	4	53	5.0	214	2.000	-1.431
1985	9	4	80	4.5	220	1.102	-2.497
1985	9	4	93	4.7	281	0.818	-2.698
1985	9	4	33	4.2	217	0.811	-3.064
1985	9	7	33	4.2	243	0.536	-3.338
1985	9	8	33	4.7	247	1.246	-2.378
1985	9	11	191	4.7	241	0.723	-2.318
1985	9	11	129	3.8	173	0.253	-3.330
1985	9	11	33	4.2	245	0.516	-3.358
1985	9	11	70	4.4	249	0.704	-2.998
1985	9	11	33	4.4	249	0.777	-2.998
1985	9	12	33	4.2	188	1.157	-2.724
1985	9	12	124	4.3	274	0.179	-3.435
1985	9	20	131	4.5	203	1.023	-2.305
1985	9	21	33	4.4	265	0.624	-3.151
1985	9	25	33	4.5	245	0.966	-2.758
1985	9	25	33	4.4	249	0.777	-2.998
1985	9	26	33	4.3	253	0.588	-3.237
1985	9	28	81	5.1	218	2.018	-1.275
1985	9	29	33	4.4	258	0.690	-3.085
1985	10	2	216	4.8	259	0.644	-2.295
1985	10	3	80	5.4	239	2.268	-0.897
1985	10	4	79	4.9	239	1.521	-1.897
1985	10	12	53	4.5	273	0.674	-3.026
1985	10	12	190	4.5	246	0.397	-2.768
1985	10	13	33	4.0	266	0.015	-3.961
1985	10	17	189	4.5	238	0.453	-2.687
1985	10	23	215	4.2	255	-0.229	-3.456

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1985	10	23	67	4.7	229	1.354	-2.194
1985	10	27	75	4.7	237	1.252	-2.277
1985	10	27	154	4.7	225	1.023	-2.151
1985	11	11	218	4.6	246	0.408	-2.568
1985	11	17	33	4.2	242	0.546	-3.328
1985	11	18	33	4.2	201	0.996	-2.882
1985	11	18	33	4.7	244	1.276	-2.348
1985	11	22	238	3.8	220	-0.757	-3.897
1985	11	22	154	4.8	234	1.106	-2.046
1985	11	26	92	4.7	231	1.252	-2.215
1985	11	29	57	5.0	227	1.852	-1.572
1985	12	1	33	4.7	237	1.347	-2.277
1985	12	6	188	4.7	247	0.700	-2.378
1985	12	10	33	4.6	281	0.781	-2.898
1985	12	11	33	4.6	266	0.915	-2.761
1985	12	14	174	4.2	260	-0.069	-3.504
1985	12	14	148	4.5	220	0.792	-2.497
1985	12	15	119	4.5	205	1.071	-2.328
1985	12	18	33	4.3	176	1.465	-2.370
1985	12	22	49	4.8	221	1.635	-1.908
1985	12	23	120	4.8	211	1.462	-1.797
1985	12	25	211	4.6	249	0.425	-2.598
1985	12	26	65	4.2	218	0.723	-3.075
1986	1	8	33	4.9	230	1.720	-1.804
1986	1	10	204	4.3	235	0.154	-2.951
1986	1	12	24	5.7	165	3.741	0.579
1986	1	14	245	5.2	222	1.293	-1.119
1986	1	18	33	4.1	216	0.673	-3.253
1986	1	22	33	4.2	280	0.190	-3.689
1986	1	30	78	4.6	226	1.199	-2.362
1986	2	3	130	4.7	292	0.627	-2.795
1986	2	3	33	4.7	223	1.495	-2.130
1986	2	4	202	4.8	237	0.842	-2.077
1986	2	6	212	4.8	224	0.866	-1.940
1986	2	6	33	4.7	269	1.038	-2.589
1986	2	11	118	4.9	227	1.481	-1.772
1986	2	16	177	4.7	253	0.713	-2.437
1986	2	17	33	5.0	256	1.609	-1.866
1986	2	20	239	4.2	227	-0.199	-3.172
1986	2	22	186	4.4	259	0.183	-3.095
1986	2	23	93	4.5	220	1.052	-2.497
1986	2	24	77	5.0	207	1.996	-1.351
1986	3	1	138	4.7	244	0.954	-2.348
1986	3	6	218	4.4	223	0.239	-2.730
1986	3	10	199	4.2	241	-0.067	-3.318
1986	3	10	33	4.6	276	0.825	-2.853
1986	3	11	207	4.7	240	0.648	-2.308
1986	3	11	206	5.3	244	1.530	-1.148
1986	3	12	203	4.6	247	0.477	-2.578
1986	3	16	33	4.3	289	0.262	-3.569
1986	3	17	77	4.5	245	0.872	-2.758
1986	3	17	148	4.2	261	0.035	-3.514
1986	3	20	33	4.9	244	1.576	-1.948
1986	3	22	87	4.1	243	0.259	-3.538
1986	3	23	132	4.2	253	0.159	-3.437
1986	3	29	33	3.6	87	2.011	-2.281
1986	4	1	33	4.2	262	0.352	-3.523
1986	4	2	33	4.6	221	1.367	-2.308
1986	4	2	33	4.3	239	0.727	-3.097
1986	4	5	190	4.2	269	-0.197	-3.589
1986	4	7	107	4.5	228	0.920	-2.583
1986	4	8	193	4.2	254	-0.118	-3.447
1986	4	14	33	4.5	256	0.859	-2.866
1986	4	15	33	4.2	228	0.691	-3.183
1986	4	18	200	4.4	248	0.185	-2.988
1986	4	25	33	3.9	218	0.350	-3.675
1986	4	25	33	4.7	232	1.399	-2.225

Estimated Earthquake Intensity Felt at Munda Damsite

Year a	Month b	Day c	Focal depth (km) d	Magnitude in Ritcher Scale (M) e	Epicentral distance (km) f	Intensity at Damsite by Cornell Imm g	Intensity at Damsite by Kawasumi Ij h
1986	4	26	186	5.6	238	2.118	-0.487
1986	4	27	33	4.6	187	1.770	-1.911
1986	4	27	230	4.4	235	0.107	-2.856
1986	4	30	33	4.5	291	0.545	-3.186
1986	5	3	99	4.8	278	0.976	-2.471
1986	5	3	33	4.1	230	0.520	-3.404
1986	5	5	128	4.5	194	1.119	-2.198
1986	5	6	104	4.9	215	1.652	-1.642
1986	5	7	222	5.6	231	1.971	-0.415
1986	5	13	164	4.6	260	0.574	-2.704
1986	5	13	186	4.5	271	0.258	-3.007
1986	5	16	101	4.3	216	0.756	-2.853
1986	5	17	33	4.5	245	0.966	-2.758
1986	5	18	93	4.8	186	1.845	-1.499
1986	5	19	220	4.2	244	-0.191	-3.348
1986	5	22	33	4.5	203	1.423	-2.305
1986	5	23	141	4.6	226	0.931	-2.362
1986	5	24	44	5.2	273	1.738	-1.626
1986	5	25	189	4.4	240	0.290	-2.908
1986	5	29	116	4.9	220	1.551	-1.697
1986	6	3	196	4.8	236	0.879	-2.067
1986	6	14	194	4.3	297	-0.232	-3.635
1986	6	16	33	4.9	222	1.806	-1.719
1986	7	3	246	4.6	242	0.286	-2.528
1986	7	11	33	4.4	245	0.816	-2.958
1986	7	17	46	5.3	257	2.031	-1.276
1986	7	23	175	4.4	258	0.239	-3.085
1986	8	21	234	5.4	236	1.580	-0.867
1986	8	22	144	4.7	226	1.066	-2.162
1986	8	24	44	4.8	221	1.646	-1.908
1986	8	26	233	4.8	247	0.627	-2.178
1986	8	28	101	4.6	245	0.944	-2.558
1986	8	29	90	4.1	240	0.276	-3.508
1986	9	6	84	5.0	228	1.759	-1.583
1986	9	9	141	4.6	198	1.158	-2.046
1986	9	13	169	4.8	243	0.968	-2.138
1986	9	13	200	4.9	237	1.002	-1.877
1986	9	13	105	4.7	286	0.747	-2.742
1986	9	15	88	5.8	262	2.639	-0.323
1986	9	24	98	4.6	269	0.751	-2.789
1986	10	10	113	4.6	214	1.169	-2.231
1986	10	11	103	4.8	202	1.631	-1.693
1986	10	13	116	5.4	195	2.529	-0.410
1986	10	15	207	4.6	232	0.546	-2.425
1986	11	3	58	4.4	290	0.371	-3.378
1986	11	6	290	3.7	249	-1.318	-4.398
1986	11	9	142	4.7	219	1.131	-2.086
1986	11	14	95	4.8	210	1.590	-1.786
1986	11	15	33	4.6	274	0.843	-2.835
1986	11	19	112	4.0	221	0.211	-3.508
1986	11	22	101	4.8	231	1.367	-2.015
1986	12	1	33	4.4	289	0.412	-3.369
1986	12	1	315	4.1	254	-0.861	-3.647
1986	12	16	130	3.9	222	-0.033	-3.719
1986	12	17	224	5.1	243	1.144	-1.538
1986	12	18	181	4.7	245	0.747	-2.358
1986	12	18	148	4.5	265	0.456	-2.951
1986	12	25	149	4.1	275	-0.219	-3.844
1986	12	26	189	4.4	248	0.239	-2.988
1987	1	1	240	3.9	93	-0.034	-5.306
1987	1	18	94	4.8	204	1.654	-1.717
1987	1	18	158	4.2	272	-0.083	-3.616
1987	1	20	183	4.5	226	0.563	-2.562
1987	1	24	33	4.6	256	1.009	-2.666
1987	2	15	200	4.1	257	-0.319	-3.676
1987	2	22	33	4.7	244	1.276	-2.348
1987	3	1	180	4.6	233	0.682	-2.436
1987	3	20	122	4.6	203	1.223	-2.105
1987	3	21	211	4.8	239	0.784	-2.097
1987	3	27	235	4.6	249	0.306	-2.598
1987	4	1	190	5.0	235	1.217	-1.656
1987	4	2	102	5.7	195	3.055	0.190
1987	4	6	33	3.8	264	-0.266	-4.342
1987	4	10	33	4.4	231	0.960	-2.815
1987	4	21	33	4.6	229	1.281	-2.394
1987	4	24	206	4.3	247	0.012	-3.178
1987	4	27	240	4.3	241	-0.128	-3.118
1987	5	5	183	4.8	270	0.727	-2.398
1987	5	5	202	5.8	243	2.306	-0.138
1987	5	10	250	4.5	232	0.166	-2.625
1987	5	13	157	4.2	253	0.054	-3.437
1987	5	14	186	4.4	261	0.170	-3.114
1987	6	9	105	4.7	207	1.423	-1.951
1987	6	11	33	3.7	244	-0.224	-4.348
1987	6	22	190	4.5	244	0.409	-2.748
1987	6	27	33	4.5	259	0.830	-2.895
1987	6	29	180	4.1	245	-0.148	-3.558
1987	6	30	243	4.8	249	0.566	-2.198
1987	7	1	33	4.3	296	0.203	-3.629
1987	7	3	111	5.0	188	2.025	-1.124
1987	7	4	179	4.2	254	-0.053	-3.447
1987	7	8	228	4.3	248	-0.104	-3.188
1987	7	9	194	4.3	243	0.096	-3.138
1987	7	12	33	4.5	225	1.174	-2.551
1987	7	18	33	4.1	280	0.040	-3.889
1987	7	23	33	4.4	125	2.415	-1.392
1987	7	28	106	4.6	218	1.165	-2.275
1987	7	28	106	4.5	174	1.446	-1.944
1987	8	2	199	4.5	263	0.249	-2.933
1987	8	18	207	4.9	234	0.984	-1.846
1987	8	24	112	4.8	234	1.296	-2.046
1987	9	1	33	4.2	296	0.053	-3.829
1987	9	3	33	4.7	259	1.130	-2.495
1987	9	7	201	4.5	231	0.434	-2.615
1987	9	23	119	4.9	213	1.599	-1.619
1987	10	3	95	5.9	233	3.022	0.164
1987	10	4	180	4.5	255	0.386	-2.856
1987	10	4	51	4.7	283	0.890	-2.716
1987	10	5	33	4.3	228	0.841	-2.983
1987	10	9	104	5.0	227	1.691	-1.572
1987	10	10	137	3.9	268	-0.423	-4.179
1987	10	12	188	4.3	258	0.030	-3.285
1987	10	14	145	4.9	222	1.392	-1.719
1987	10	17	222	4.8	257	0.626	-2.276
1987	10	18	47	4.8	265	1.205	-2.351
1987	10	26	33	4.5	270	0.729	-2.998
1987	10	31	177	4.2	246	0.010	-3.368
1987	11	2	33	4.5	211	1.329	-2.397
1987	11	11	205	4.5	241	0.353	-2.718
1987	11	17	87	4.6	202	1.406	-2.093
1987	11	21	129	4.6	204	1.176	-2.117
1987	11	28	219	4.4	254	0.057	-3.047
1987	12	8	33	4.4	154	1.932	-1.863
1987	12	9	112	4.3	248	0.428	-3.188
1987	12	10	33	4.3	289	0.262	-3.569
1987	12	13	134	4.0	241	-0.055	-3.718
1988	1	3	230	4.5	252	0.165	-2.827
1988	1	3	238	3.8	225	-0.784	-3.951
1988	1	4	203	4.2	237	-0.063	-3.277
1988	1	5	33	4.2	249	0.477	-3.398
1988	1	12	57	4.7	249	1.185	-2.398
1988	1	13	192	4.8	236	0.900	-2.067
1988	1	17	116	4.9	201	1.723	-1.482
1988	1	18	211	4.9	242	0.916	-1.928

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1988	1	19	197	4.9	235	1.030	-1.856
1988	1	21	33	4.0	267	0.006	-3.970
1988	1	27	33	4 2	279	0.198	-3.680
1988	2	7	33	4.7	234	1.378	-2 246
1988	3	1	210	4 2	267	-0.274	-3.570
1988	3	7	33	4 6	252	1.047	-2.627
1988	3	14	169	4.3	257	0.123	-3.276
1988	3	17	33	4 1	236	0.457	-3.467
1988	3	23	103	4.1	192	0.680	-2.973
1988	3	23	117	4.8	286	0.861	-2.542
1988	3	25	239	4 5	250	0.131	-2 807
1988	3	25	135	4 5	218	0.875	-2.475
1988	3	27	92	4.8	223	1.477	-1.930
1988	3	28	182	4.2	236	0.051	-3.267
1988	4	2	227	4 2	253	-0.276	-3.437
1988	4	9	33	4.6	282	0.772	-2.907
1988	4	10	232	4.5	235	0.245	-2.656
1988	4	11	33	4.4	234	0.928	-2 846
1988	4	12	33	4 2	205	0.949	-2.928
1988	4	22	33	4 3	135	2 089	-1.765
1988	4	23	38	4.8	288	1.015	-2.560
1988	4	23	181	4.4	251	0 258	-3.017
1988	4	25	57	4.7	274	0.958	-2 635
1988	5	10	33	4.5	273	0.702	-3.026
1988	5	11	71	4.5	229	1.012	-2.594
1988	5	15	33	4 5	233	1.089	-2.636
1988	5	18	33	4 6	278	0.807	-2.871
1988	5	19	33	4.0	287	-0.171	-4.151
1988	5	20	148	4.7	219	1.100	-2 086
1988	6	3	90	5.0	240	1.626	-1.708
1988	6	3	129	5.1	219	1.797	-1.286
1988	6	25	240	4.0	241	-0 578	-3.718
1988	6	30	43	4.2	276	0.213	-3.653
1988	7	8	210	4 5	236	0 356	-2.667
1988	7	9	33	4.4	227	1.002	-2.772
1988	7	22	184	4 6	259	0.492	-2.695
1988	7	26	33	4.6	225	1.324	-2 351
1988	7	27	33	4 5	284	0.605	-3.125
1988	7	31	79	4 5	245	0.866	-2.758
1988	8	1	184	4 2	245	-0.018	-3.358
1988	8	3	201	5.5	238	1.891	-0.687
1988	8	3	205	4 8	235	0.839	-2 056
1988	8	6	195	6.1	235	2 841	0.544
1988	8	10	126	4.9	294	0.925	-2.412
1988	8	10	100	4.7	219	1.332	-2 086
1988	8	12	33	4.4	239	0.877	-2.897
1988	8	31	68	4.8	219	1.603	-1.886
1988	9	3	33	4.6	187	1.770	-1.911
1988	9	9	99	5.4	236	2 230	-0.867
1988	9	9	100	4.7	244	1.106	-2.348
1988	9	10	33	4.1	296	-0.097	-4.029
1988	9	10	95	4.6	186	1.534	-1.899
1988	9	11	203	4 6	245	0.459	-2.558
1988	9	14	33	4.7	277	0.966	-2.662
1988	9	18	33	4.5	239	1.027	-2 697
1988	9	25	146	4.9	221	1.395	-1.708
1988	9	25	212	5.6	236	1.996	-0.467
1988	9	26	106	5.6	215	2.693	-0.242
1988	10	11	231	4.3	221	0.027	-2.908
1988	10	16	86	4.3	265	0.369	-3.351
1988	10	21	184	4.3	254	0.074	-3.247
1988	10	22	174	4 2	262	-0 083	-3.523
1988	10	24	33	4.4	60	3.931	-0.005
1988	10	24	33	4.3	256	0.559	-3.266
1988	10	26	219	5.1	241	1.181	-1.518
1988	11	24	128	4 2	247	0 223	-3.378
1988	11	25	33	4.7	69	4.125	0 365
1988	11	27	91	4 8	190	1.813	-1.549
1988	11	28	33	4.3	290	0 253	-3 578
1988	11	28	169	4.7	244	0.714	-2.348
1988	12	3	33	4 8	240	1.466	-2.108
1988	12	7	33	4.7	151	2.428	-1 218
1988	12	11	33	4.2	230	0 670	-3 204
1988	12	25	228	4.6	250	0 335	-2 607
1989	1	12	33	4.7	211	1.629	-1.997
1989	1	13	33	4 3	278	0 357	-3.471
1989	1	19	33	4.2	277	0 216	-3 662
1989	1	24	112	4 3	231	0 572	-3.015
1989	1	27	65	4.7	217	1.483	-2.064
1989	2	3	206	4.4	221	0.317	-2.708
1989	2	11	33	4.1	249	0 327	-3 598
1989	2	20	60	4.7	212	1.552	-2 008
1989	2	23	61	4.1	225	0 512	-3 351
1989	2	25	33	4.8	220	1.678	-1.897
1989	2	25	110	4.5	204	1.126	-2 317
1989	3	1	193	4 2	231	0 027	-3.215
1989	3	2	33	3.7	268	-0.453	-4 579
1989	3	4	141	4 6	216	1.011	-2 253
1989	3	5	66	3.9	228	0.167	-3.783
1989	3	6	33	4.7	293	0 828	-2 804
1989	3	6	107	4 5	291	0.403	-3.186
1989	3	8	138	4.6	197	1.184	-2 034
1989	3	18	157	4.1	237	0 019	-3.477
1989	3	29	211	4.7	238	0.639	-2.287
1989	3	30	169	4 2	248	0 034	-3.388
1989	4	5	33	3.8	262	-0 248	-4 323
1989	4	7	33	4 2	175	1.329	-2 557
1989	4	7	203	4.3	260	-0 051	-3.301
1989	4	20	33	3.8	200	0.409	-3.670
1989	4	21	87	4.1	231	0 370	-3.415
1989	4	24	54	4 5	265	0.743	-2.951
1989	4	28	33	4 2	229	0 681	-3.194
1989	4	28	173	3.9	245	-0.414	-3.958
1989	5	1	233	4.2	229	-0.177	-3.191
1989	5	6	84	4.6	234	1.102	-2.446
1989	5	6	219	4.8	260	0.624	-2 304
1989	5	7	111	4 5	283	0.452	-3.116
1989	5	7	33	4.1	297	-0.105	-4 038
1989	5	7	169	4.6	265	0 519	-2.751
1989	5	9	164	4.4	252	0.329	-3.027
1989	5	12	33	4.7	232	1.399	-2 225
1989	5	20	212	4.8	240	0.773	-2 108
1989	5	26	182	3.6	248	-0 927	-4 588
1989	5	29	268	4 2	256	-0.492	-3.466
1989	6	9	223	4 5	251	0.205	-2.817
1989	6	11	224	4.1	237	-0.323	-3.477
1989	6	20	145	4 5	224	0.776	-2 540
1989	6	21	33	4 2	271	0.270	-3.607
1989	6	26	118	4.9	164	2.067	-1.007
1989	6	26	187	4 5	268	0 272	-2.979
1989	6	26	33	4.5	51	4 355	0.428
1989	6	27	33	4.5	284	0.605	-3.125
1989	7	24	95	5.8	193	3.261	0.414
1989	7	24	83	4.4	196	1.188	-2.422
1989	7	29	122	4.7	245	1.013	-2 358
1989	8	1	189	4 2	241	-0.036	-3.348
1989	8	10	121	4.8	197	1 583	-1.634
1989	8	12	222	4.5	254	0.193	-2 847
1989	8	15	33	4 6	257	0 999	-2.676
1989	8	18	104	4.6	220	1.155	-2.297
1989	8	23	177	4.6	257	0 537	-2.676
1989	8	24	72	4 5	274	0 628	-3.035
1989	8	25	33	3.9	262	-0.098	-4.123
1989	9	1	102	4 5	203	1.176	-2.305

Estimated Earthquake Intensity Felt at Munda Damsite

Year a	Month b	Day c	Focal depth (km) d	Magnitude in Ritcher Scale (M) e	Epicentral distance (km) f	Intensity at Damsite by Cornell Imm g	Intensity at Damsite by Kawasumi Ij h
1989	9	10	33	4.6	239	1.177	-2.497
1989	9	17	218	4.4	231	0.193	-2.815
1989	9	22	33	4.5	268	0.747	-2.979
1989	10	25	33	4.3	268	0.447	-3.379
1989	10	26	98	4.3	245	0.504	-3.158
1989	10	26	195	4.5	242	0.397	-2.728
1989	10	27	214	4.5	229	0.376	-2.594
1989	11	3	33	4.5	298	0.486	-3.247
1989	11	10	111	4.7	219	1.283	-2.086
1989	11	12	77	3.9	233	0.085	-3.836
1989	11	12	214	4.3	224	0.105	-2.940
1989	11	13	211	4.1	244	-0.296	-3.548
1989	11	17	101	4.1	299	-0.241	-4.055
1989	11	19	197	4.8	235	0.880	-2.056
1989	12	2	33	4.5	218	1.250	-2.475
1989	12	12	176	4.6	239	0.662	-2.497
1989	12	17	101	4.9	230	1.526	-1.804
1989	12	20	142	4.7	234	1.013	-2.246
1989	12	22	183	4.8	244	0.894	-2.148
1989	12	31	155	4.5	193	0.963	-2.186
1990	1	5	79	4.6	183	1.650	-1.861
1990	1	21	33	4.5	71	3.770	-0.085
1990	1	21	33	4.7	122	2.921	-0.738
1990	1	22	88	4.5	248	0.811	-2.785
1990	1	26	148	4.1	235	0.077	-3.456
1990	2	1	137	4.5	222	0.833	-2.519
1990	2	5	109	6.1	299	2.738	-0.055
1990	2	5	205	4.6	245	0.479	-2.558
1990	2	6	117	5.0	203	1.849	-1.305
1990	2	7	33	4.3	273	0.402	-3.426
1990	2	13	118	4.1	254	0.056	-3.647
1990	2	17	104	4.7	274	0.843	-2.635
1990	2	25	79	4.6	194	1.527	-1.998
1990	2	25	33	3.8	257	-0.201	-4.276
1990	2	25	103	4.8	283	0.925	-2.516
1990	2	27	125	4.9	233	1.399	-1.836
1990	3	8	33	4.3	291	0.245	-3.586
1990	3	22	154	4.2	266	-0.025	-3.561
1990	3	25	33	4.5	299	0.478	-3.255
1990	3	30	210	4.5	241	0.327	-2.718
1990	4	1	74	5.1	166	2.628	-0.635
1990	4	2	33	4.4	245	0.816	-2.958
1990	4	5	206	4.3	235	0.083	-3.056
1990	4	5	33	5.4	269	2.088	-1.189
1990	4	6	33	4.3	233	0.789	-3.036
1990	4	10	126	4.8	244	1.155	-2.148
1990	4	16	33	4.5	259	0.830	-2.895
1990	4	18	33	4.0	229	0.381	-3.594
1990	4	19	10	4.5	271	0.736	-3.007
1990	4	19	244	4.2	274	-0.466	-3.635
1990	4	19	33	5.2	150	3.193	-0.203
1990	4	21	79	4.6	218	1.275	-2.275
1990	4	21	170	3.4	269	-1.312	-5.189
1990	4	24	45	4.8	243	1.417	-2.138
1990	4	27	33	4.7	155	2.366	-1.278
1990	4	28	45	4.7	285	0.882	-2.734
1990	4	30	159	4.2	281	-0.148	-3.698
1990	5	2	33	4.2	179	1.275	-2.609
1990	5	2	254	4.6	229	0.309	-2.394
1990	5	2	244	4.5	230	0.208	-2.604
1990	5	12	159	4.3	282	-0.005	-3.507
1990	5	14	33	4.1	297	-0.105	-4.038
1990	5	15	113	5.9	204	3.211	0.483
1990	5	19	194	4.3	240	0.115	-3.108
1990	5	19	33	4.0	246	0.206	-3.768
1990	5	21	33	4.3	247	0.646	-3.178
1990	5	24	173	4.4	249	0.309	-2.998
1990	5	25	33	4.0	290	-0.197	-4.178
1990	5	26	192	4.5	252	0.349	-2.827
1990	5	27	33	4.7	260	1.121	-2.504
1990	5	28	135	4.3	268	0.184	-3.379
1990	5	30	203	4.7	249	0.615	-2.398
1990	6	12	202	4.3	253	-0.005	-3.237
1990	6	16	190	4.6	224	0.688	-2.340
1990	6	16	109	4.6	178	1.536	-1.796
1990	6	19	33	4.9	195	2.119	-1.410
1990	6	21	191	4.4	230	0.344	-2.801
1990	6	23	204	4.7	242	0.652	-2.328
1990	6	24	33	4.1	287	-0.021	-3.951
1990	6	26	185	4.5	251	0.389	-2.817
1990	6	29	33	4.4	188	1.457	-2.324
1990	6	30	168	4.5	247	0.496	-2.778
1990	7	3	33	4.2	264	0.334	-3.542
1990	7	7	150	3.8	213	-0.214	-3.819
1990	7	13	216	5.6	234	1.986	-0.446
1990	7	17	196	4.2	245	-0.077	-3.358
1990	7	31	227	4.3	251	-0.115	-3.217
1990	8	6	33	4.2	284	0.155	-3.725
1990	8	8	33	4.8	263	1.243	-2.333
1990	8	24	33	4.1	150	1.543	-2.403
1990	8	29	99	4.5	243	0.818	-2.738
1990	9	3	201	4.9	235	1.010	-1.856
1990	9	4	33	4.6	69	3.975	0.165
1990	9	9	189	4.6	268	0.413	-2.779
1990	9	9	218	4.0	224	-0.367	-3.540
1990	9	10	33	4.3	277	0.366	-3.462
1990	9	14	73	3.9	263	-0.180	-4.133
1990	9	14	33	4.3	248	0.637	-3.188
1990	9	30	33	3.9	270	-0.171	-4.198
1990	10	11	71	4.2	260	0.302	-3.504
1990	10	13	79	4.2	227	0.586	-3.172
1990	10	25	113	6.0	115	4.274	1.993
1990	10	29	206	4.8	242	0.791	-2.128
1990	10	30	33	4.7	270	1.029	-2.598
1990	11	7	185	4.4	239	0.317	-2.897
1990	11	8	33	3.8	243	-0.064	-4.138
1990	11	8	141	3.8	252	-0.470	-4.227
1990	11	10	33	5.3	111	4.034	0.671
1990	11	12	235	5.0	228	1.017	-1.583
1990	11	13	183	4.5	249	0.411	-2.798
1990	11	14	33	4.0	176	1.015	-2.970
1990	11	15	222	4.3	239	-0.023	-3.097
1990	12	2	33	4.1	252	0.297	-3.627
1990	12	3	33	4.2	298	0.036	-3.847
1990	12	4	202	4.6	255	0.433	-2.656
1990	12	9	189	3.7	261	-0.893	-4.514
1990	12	20	237	4.1	167	-0.030	-2.649
1990	12	21	170	5.0	244	1.257	-1.748
1990	12	21	33	4.6	264	0.934	-2.742
1991	1	1	33	4.2	264	0.334	-3.542
1991	1	6	33	4.6	280	0.790	-2.889
1991	1	9	212	4.5	241	0.317	-2.718
1991	1	13	33	4.5	296	0.503	-3.229
1991	1	21	115	4.7	236	1.117	-2.267
1991	1	22	170	3.6	249	-0.877	-4.598
1991	1	28	33	5.2	230	2.170	-1.204
1991	1	31	142	6.6	199	4.144	1.942
1991	1	31	206	4.6	225	0.593	-2.351
1991	2	3	33	4.1	297	-0.105	-4.038
1991	2	11	216	4.8	263	0.621	-2.333
1991	2	12	190	4.3	268	-0.041	-3.379
1991	2	12	33	4.4	209	1.202	-2.574
1991	2	17	33	4.6	117	2.865	-0.846
1991	2	21	33	4.2	273	0.252	-3.626

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1991	2	23	154	4.9	221	1.353	-1.708
1991	2	25	195	4.4	235	0.291	-2.856
1991	2	27	198	4.3	242	0.082	-3.128
1991	3	1	105	4.5	227	0.937	-2.572
1991	3	2	148	4.4	237	0.512	-2.877
1991	3	3	26	4.6	114	2.960	-0.788
1991	3	5	153	4.4	275	0.216	-3.244
1991	3	9	220	4.1	236	-0.296	-3.467
1991	3	16	33	4.6	124	2.734	-0.975
1991	3	23	214	5.0	229	1.126	-1.594
1991	3	23	204	3.9	248	-0.584	-3.938
1991	3	24	121	4.6	222	1.060	-2.319
1991	3	26	99	3.7	269	-0.602	-4.589
1991	3	29	97	4.3	214	0.792	-2.831
1991	4	2	235	4.7	251	0.445	-2.417
1991	4	13	190	3.4	243	-1.234	-4.938
1991	4	15	123	5.3	220	2.118	-0.897
1991	4	16	126	5.1	211	1.881	-1.197
1991	4	19	187	3.8	261	-0.734	-4.314
1991	4	19	49	4.2	212	0.833	-3.008
1991	4	20	33	4.1	232	0.499	-3.425
1991	4	21	33	3.9	245	0.066	-3.958
1991	4	22	69	4.3	247	0.575	-3.178
1991	4	24	211	4.1	252	-0.342	-3.627
1991	4	27	240	4.4	231	0.074	-2.815
1991	4	27	208	4.9	244	0.919	-1.948
1991	5	5	116	4.5	215	0.996	-2.442
1991	5	13	73	4.1	217	0.557	-3.264
1991	5	14	67	4.4	248	0.721	-2.988
1991	5	14	72	3.9	240	0.033	-3.908
1991	5	17	33	3.8	289	-0.488	-4.569
1991	5	21	33	3.9	259	-0.070	-4.095
1991	5	22	180	3.5	265	-1.178	-4.951
1991	5	24	33	4.0	151	1.378	-2.618
1991	5	27	194	4.5	269	0.235	-2.989
1991	6	1	25	4.7	295	0.818	-2.821
1991	6	2	33	4.1	264	0.184	-3.742
1991	6	4	159	4.7	268	0.690	-2.579
1991	6	5	225	3.9	229	-0.584	-3.794
1991	6	5	33	4.5	282	0.622	-3.107
1991	6	7	33	4.2	259	0.380	-3.495
1991	6	9	33	4.8	235	1.518	-2.056
1991	6	11	194	4.0	249	-0.392	-3.798
1991	6	12	33	3.9	243	0.086	-3.938
1991	6	13	151	4.6	214	0.973	-2.231
1991	6	15	33	4.2	160	1.541	-2.350
1991	6	15	224	4.2	231	-0.139	-3.215
1991	6	17	33	4.5	241	1.006	-2.718
1991	6	18	33	4.4	270	0.579	-3.198
1991	7	4	33	4.0	243	0.236	-3.738
1991	7	14	212	6.4	220	3.290	1.303
1991	7	16	33	4.3	79	3.259	-0.685
1991	7	22	119	4.6	239	0.925	-2.497
1991	7	25	193	4.0	245	-0.362	-3.758
1991	8	1	78	4.5	247	0.850	-2.778
1991	8	16	137	4.7	240	0.939	-2.308
1991	8	20	33	4.8	225	1.624	-1.951
1991	8	21	33	4.3	246	0.656	-3.168
1991	8	25	210	4.6	237	0.501	-2.477
1991	8	25	10	4.3	109	2.670	-1.289
1991	9	1	51	4.6	250	1.038	-2.607
1991	9	5	33	3.9	251	0.007	-4.017
1991	9	8	132	5.0	212	1.691	-1.408
1991	9	11	205	4.5	245	0.329	-2.758
1991	9	15	107	4.8	271	1.008	-2.407
1991	9	19	99	5.0	219	1.786	-1.486
1991	9	21	227	4.6	233	0.433	-2.436
1991	9	27	221	3.9	248	-0.669	-3.988
1991	9	29	33	4.7	291	0.845	-2.786
1991	10	2	292	3.8	285	-1.331	-4.534
1991	10	25	104	4.4	223	0.828	-2.730
1991	10	28	174	4.8	259	0.837	-2.295
1991	10	30	173	5.0	252	1.188	-1.827
1991	11	2	115	4.8	241	1.225	-2.118
1991	11	3	164	4.4	242	0.399	-2.928
1991	11	9	169	4.4	225	0.494	-2.751
1991	11	11	94	4.8	239	1.321	-2.097
1991	11	12	59	4.4	210	1.127	-2.586
1991	11	12	130	4.2	199	0.614	-2.858
1991	11	23	33	3.7	261	-0.388	-4.514
1991	11	27	187	4.5	271	0.253	-3.007
1991	11	28	282	4.3	242	-0.348	-3.128
1991	12	4	41	4.8	282	1.063	-2.507
1991	12	31	212	4.1	243	-0.295	-3.538
1992	1	4	10	3.6	287	-0.756	-4.951
1992	1	4	29	5.1	293	1.432	-2.004
1992	1	6	219	4.6	258	0.335	-2.685
1992	1	6	63	4.3	242	0.638	-3.128
1992	1	7	175	4.6	199	0.944	-2.058
1992	1	7	261	4.3	212	-0.099	-2.808
1992	1	16	33	3.4	62	2.373	-2.056
1992	1	18	114	4.8	238	1.254	-2.087
1992	1	21	33	3.7	165	0.719	-3.421
1992	1	21	65	3.9	224	0.208	-3.740
1992	1	22	202	3.8	260	-0.797	-4.304
1992	1	22	33	3.6	271	-0.630	-4.807
1992	1	23	243	4.3	231	-0.092	-3.015
1992	1	23	33	3.9	261	-0.088	-4.114
1992	1	28	33	4.3	278	0.357	-3.471
1992	2	1	195	4.7	235	0.741	-2.256
1992	2	6	33	3.6	266	-0.585	-4.761
1992	2	6	33	4.1	123	2.002	-1.957
1992	2	11	33	4.4	246	0.806	-2.968
1992	2	12	241	4.0	239	-0.572	-3.697
1992	2	22	33	4.0	242	0.246	-3.728
1992	2	29	185	4.6	244	0.584	-2.548
1992	3	1	33	3.7	277	-0.534	-4.662
1992	3	1	33	3.9	233	0.189	-3.836
1992	3	6	211	4.1	241	-0.278	-3.518
1992	3	6	220	4.3	238	-0.007	-3.087
1992	3	7	33	3.8	224	0.134	-3.940
1992	3	10	33	4.5	187	1.620	-2.111
1992	3	12	33	4.4	166	1.754	-2.035
1992	3	17	228	4.4	230	0.144	-2.804
1992	3	20	33	4.3	268	0.447	-3.379
1992	3	24	14	5.0	156	2.845	-0.692
1992	3	27	35	4.9	213	1.903	-1.619
1992	3	27	33	3.7	216	0.073	-4.053
1992	3	29	33	5.1	125	3.465	0.008
1992	3	30	55	4.4	192	1.345	-2.373
1992	3	31	33	3.8	288	-0.480	-4.560
1992	4	9	200	4.4	239	0.240	-2.897
1992	4	13	173	3.5	268	-1.168	-4.979
1992	4	16	33	3.9	145	1.323	-2.726
1992	4	16	93	4.8	247	1.254	-2.178
1992	4	17	81	4.2	219	0.658	-3.086
1992	4	17	12	4.2	105	2.605	-1.407
1992	4	20	204	4.5	239	0.370	-2.697
1992	4	25	225	4.2	240	-0.195	-3.308
1992	5	4	48	4.7	218	1.520	-2.075
1992	5	10	33	4.0	248	0.187	-3.785
1992	5	12	33	3.9	192	0.657	-3.373
1992	5	14	116	4.1	195	0.579	-3.010
1992	5	15	33	4.3	249	0.627	-3.198

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1992	5	20	16	6.0	107	5.248	2.151
1992	5	25	48	4.9	261	1.390	-2.114
1992	5	30	77	4.4	134	1.978	-1.548
1992	5	31	33	3.9	233	0.189	-3.836
1992	5	31	33	4.6	119	2.827	-0.883
1992	6	5	33	4.9	123	3.202	-0.357
1992	6	5	33	4.4	247	0.796	-2.978
1992	6	9	33	4.4	116	2.585	-1.227
1992	6	12	33	4.2	187	1.170	-2.711
1992	6	14	180	4.1	232	-0.062	-3.425
1992	6	16	123	4.7	263	0.866	-2.533
1992	6	19	130	4.7	293	0.620	-2.804
1992	6	19	33	3.9	247	0.046	-3.978
1992	6	20	33	4.2	244	0.526	-3.348
1992	7	11	197	3.5	256	-1.199	-4.866
1992	7	17	33	4.1	223	0.595	-3.330
1992	7	24	81	4.6	239	1.065	-2.497
1992	8	10	111	5.3	239	2.008	-1.097
1992	8	13	77	4.7	161	2.073	-1.365
1992	8	29	215	4.6	264	0.320	-2.742
1992	9	4	33	4.8	227	1.602	-1.972
1992	9	11	66	5.0	167	2.508	-0.849
1992	9	11	208	4.7	237	0.661	-2.277
1992	9	12	197	4.9	239	1.006	-1.897
1992	9	20	137	4.7	221	1.141	-2.108
1992	9	26	155	4.6	282	0.460	-2.907
1992	9	27	245	4.4	217	0.118	-2.664
1992	9	27	33	4.5	285	0.596	-3.134
1992	10	12	33	5.1	265	1.674	-1.751
1992	10	13	33	4.4	167	1.740	-2.049
1992	10	18	77	4.8	239	1.377	-2.097
1992	10	19	33	4.0	245	0.216	-3.758
1992	11	1	48	4.5	195	1.482	-2.210
1992	11	5	203	4.4	253	0.141	-3.037
1992	11	6	33	4.5	178	1.738	-1.996
1992	11	12	198	5.7	236	2.219	-0.267
1992	11	23	228	4.5	251	0.180	-2.817
1992	11	26	188	4.1	251	-0.225	-3.617
1992	12	16	137	4.5	162	1.346	-1.779
1992	12	20	46	4.6	232	1.226	-2.425
1992	12	21	83	5.0	265	1.427	-1.951
1992	12	25	33	3.8	295	-0.539	-4.621
1992	12	26	87	5.1	226	1.917	-1.362
1993	1	9	180	4.5	264	0.328	-2.942
1993	1	19	72	4.6	191	1.591	-1.961
1993	1	21	93	5.2	251	1.819	-1.417
1993	1	25	218	4.5	241	0.286	-2.718
1993	1	28	216	4.8	259	0.644	-2.295
1993	2	9	201	4.0	240	-0.371	-3.708
1993	2	11	84	4.7	227	1.319	-2.172
1993	2	15	76	4.3	251	0.519	-3.217
1993	2	15	211	5.0	240	1.078	-1.708
1993	2	17	33	3.7	231	-0.090	-4.215
1993	2	17	13	5.0	141	3.093	-0.463
1993	2	19	188	4.2	238	0.008	-3.287
1993	2	19	117	4.6	227	1.035	-2.372
1993	2	20	33	4.3	264	0.484	-3.342
1993	2	24	33	4.9	154	2.682	-0.863
1993	3	1	183	4.8	258	0.803	-2.285
1993	3	8	33	4.3	270	0.429	-3.398
1993	3	10	33	4.2	215	0.834	-3.042
1993	3	14	33	4.2	211	0.879	-2.997
1993	3	25	93	5.3	185	2.606	-0.456
1993	3	26	226	4.5	255	0.168	-2.856
1993	3	28	165	4.1	260	-0.180	-3.704
1993	3	28	184	4.4	246	0.276	-2.968
1993	3	30	184	4.6	247	0.569	-2.578
1993	3	31	33	4.1	262	0.202	-3.723
1993	4	8	179	4.0	252	-0.339	-3.827
1993	4	13	50	4.3	208	1.025	-2.763
1993	4	13	111	4.7	268	0.869	-2.579
1993	4	13	109	4.4	175	1.267	-2.157
1993	4	20	166	4.3	245	0.219	-3.158
1993	4	24	221	4.9	239	0.882	-1.897
1993	4	25	38	4.4	240	0.859	-2.908
1993	4	26	141	4.9	222	1.412	-1.719
1993	4	27	126	4.4	231	0.661	-2.815
1993	5	2	33	4.5	187	1.620	-2.111
1993	5	5	229	4.6	231	0.434	-2.415
1993	5	7	252	4.7	251	0.361	-2.417
1993	5	10	33	4.5	274	0.693	-3.035
1993	5	12	33	4.1	225	0.574	-3.351
1993	5	17	150	3.9	249	-0.337	-3.998
1993	5	18	33	4.2	226	0.713	-3.162
1993	5	21	135	4.5	201	1.018	-2.282
1993	5	22	102	4.4	243	0.657	-2.938
1993	5	25	33	4.5	273	0.702	-3.026
1993	5	31	204	3.8	252	-0.758	-4.227
1993	5	31	364	4.3	109	-0.404	-1.289
1993	5	31	33	4.8	250	1.367	-2.207
1993	6	6	221	4.1	220	-0.211	-3.297
1993	6	6	33	4.6	224	1.334	-2.340
1993	6	8	33	4.8	155	2.516	-1.078
1993	6	11	33	4.8	273	1.152	-2.426
1993	6	14	162	4.4	263	0.262	-3.133
1993	6	17	104	5.2	201	2.235	-0.882
1993	6	18	209	5.1	247	1.197	-1.578
1993	7	2	87	4.5	198	1.298	-2.246
1993	7	23	33	4.0	296	-0.247	-4.229
1993	7	23	272	5.7	245	1.789	-0.358
1993	7	24	223	4.6	241	0.410	-2.518
1993	7	28	265	4.1	258	-0.636	-3.685
1993	7	28	33	4.1	258	0.240	-3.685
1993	8	2	115	4.6	292	0.523	-2.995
1993	8	7	198	4.3	245	0.063	-3.158
1993	8	9	204	6.4	238	3.226	1.113
1993	8	9	214	7.0	228	4.132	2.417
1993	8	15	33	3.9	267	-0.144	-4.170
1993	8	19	33	4.7	140	2.604	-1.047
1993	9	4	194	6.0	235	2.696	0.344
1993	9	18	112	6.3	230	3.581	0.996
1993	9	26	106	4.6	211	1.230	-2.197
1993	9	29	187	4.6	233	0.645	-2.436
1993	10	7	216	4.9	240	0.902	-1.908
1993	10	20	33	4.1	276	0.075	-3.853
1993	11	7	33	4.7	62	4.323	0.544
1993	11	13	173	4.3	247	0.172	-3.178
1993	11	14	111	4.5	216	1.010	-2.453
1993	11	25	194	4.6	237	0.583	-2.477
1993	11	28	107	5.1	235	1.758	-1.456
1993	11	30	169	4.3	243	0.218	-3.138
1993	12	2	219	4.8	243	0.719	-2.138
1993	12	6	130	4.1	157	0.845	-2.507
1993	12	12	33	4.0	84	2.684	-1.408
1993	12	17	204	4.1	258	-0.344	-3.685
1993	12	17	150	3.8	277	-0.687	-4.462
1993	12	19	33	4.2	242	0.546	-3.328
1993	12	20	33	4.6	220	1.378	-2.297
1993	12	25	195	4.4	256	0.160	-3.066
1994	1	3	33	4.0	56	3.451	-0.702
1994	1	7	37	4.7	46	4.719	0.882
1994	1	8	97	4.8	192	1.761	-1.573
1994	1	9	33	4.6	214	1.445	-2.231
1994	1	9	11	4.7	244	1.296	-2.348

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1994	1	9	33	4.6	265	0.924	-2.751
1994	1	15	209	4.3	256	-0.056	-3.266
1994	1	15	33	4.3	268	0.447	-3.379
1994	1	25	33	4.1	235	0.468	-3.456
1994	1	25	223	4.9	230	0.922	-1.804
1994	1	29	33	4.1	242	0.396	-3.528
1994	1	31	181	3.8	237	-0.550	-4.077
1994	2	2	74	4.6	223	1.242	-2.330
1994	2	13	33	3.7	232	-0.101	-4.225
1994	2	24	193	4.8	265	0.714	-2.351
1994	3	1	33	3.9	285	-0.304	-4.334
1994	3	2	24	4.8	268	1.206	-2.379
1994	3	6	104	4.4	276	0.377	-3.253
1994	3	7	193	4.4	236	0.295	-2.867
1994	3	11	33	4.2	244	0.526	-3.348
1994	3	19	227	4.2	239	-0.199	-3.297
1994	3	30	33	4.1	258	0.240	-3.685
1994	4	4	79	4.7	295	0.741	-2.821
1994	4	15	33	4.5	252	0.897	-2.827
1994	4	17	128	4.5	298	0.291	-3.247
1994	4	17	217	4.1	267	-0.456	-3.770
1994	4	18	133	5.0	221	1.611	-1.508
1994	4	22	169	4.4	280	0.120	-3.289
1994	4	27	233	4.0	226	-0.461	-3.562
1994	5	5	33	4.4	296	0.353	-3.429
1994	5	6	33	3.8	246	-0.094	-4.168
1994	5	23	90	3.8	296	-0.642	-4.629
1994	5	25	33	4.4	134	2.256	-1.548
1994	6	3	33	4.7	273	1.002	-2.626
1994	6	6	33	4.7	219	1.539	-2.086
1994	6	9	87	5.4	287	1.836	-1.351
1994	6	11	133	4.7	230	1.087	-2.204
1994	6	19	81	4.4	233	0.822	-2.836
1994	6	30	226	6.5	219	3.366	1.514
1994	7	6	33	4.8	297	0.945	-2.638
1994	7	10	230	5.2	259	1.177	-1.495
1994	7	12	248	4.6	229	0.341	-2.394
1994	7	18	170	4.2	269	-0.112	-3.589
1994	7	24	119	5.6	296	1.982	-1.029
1994	7	27	129	4.5	231	0.798	-2.615
1994	7	28	128	4.4	227	0.685	-2.772
1994	7	29	118	4.5	230	0.855	-2.604
1994	8	17	145	4.4	250	0.428	-3.007
1994	8	23	33	4.8	257	1.299	-2.276
1994	8	30	33	4.3	269	0.438	-3.389
1994	9	4	194	4.9	253	0.934	-2.037
1994	9	9	33	4.8	280	1.090	-2.489
1994	9	30	241	4.7	229	0.529	-2.194
1994	10	21	47	5.5	269	2.219	-0.989
1994	10	21	237	4.8	228	0.706	-1.983
1994	10	25	238	6.2	225	2.816	0.849
1994	11	11	141	4.8	221	1.270	-1.908
1994	11	16	33	4.7	215	1.584	-2.042
1994	11	17	33	4.5	222	1.206	-2.519
1994	11	29	33	4.5	175	1.779	-1.957
1994	12	8	199	5.1	235	1.320	-1.456
1994	12	8	33	4.5	274	0.693	-3.035
1994	12	11	33	4.3	239	0.727	-3.097
1994	12	12	165	5.2	231	1.672	-1.215
1994	12	16	151	4.2	274	-0.069	-3.635
1994	12	19	33	4.1	75	3.063	-0.935
1994	12	26	226	5.4	235	1.628	-0.856
1994	12	26	194	4.5	244	0.390	-2.748
1995	1	1	84	4.2	191	0.937	-2.761
1995	1	6	33	4.0	213	0.556	-3.419
1995	1	7	208	4.6	231	0.547	-2.415
1995	1	8	205	5.4	243	1.691	-0.938
1995	1	11	33	4.3	173	1.506	-2.330
1995	1	17	33	4.1	205	0.799	-3.128
1995	1	17	144	4.0	241	-0.100	-3.718
1995	1	17	27	4.6	61	4.292	0.447
1995	1	18	170	4.5	271	0.325	-3.007
1995	1	18	217	4.5	240	0.297	-2.708
1995	1	23	183	4.5	249	0.411	-2.795
1995	1	26	106	5.2	199	2.245	-0.858
1995	1	29	109	5.3	286	1.635	-1.542
1995	1	30	77	4.9	218	1.732	-1.675
1995	2	5	207	4.3	248	0.001	-3.188
1995	2	10	44	4.6	286	0.725	-2.942
1995	2	10	33	4.6	277	0.816	-2.862
1995	2	11	33	4.1	287	-0.021	-3.951
1995	2	15	119	4.7	201	1.407	-1.882
1995	2	15	204	4.1	241	-0.242	-3.518
1995	2	18	33	4.4	248	0.787	-2.988
1995	2	25	182	4.7	244	0.749	-2.348
1995	3	4	200	3.9	275	-0.727	-4.244
1995	3	4	33	4.1	295	-0.089	-4.021
1995	3	5	200	3.9	241	-0.337	-3.597
1995	3	8	150	4.1	218	0.197	-3.275
1995	3	10	131	4.2	223	0.404	-3.130
1995	3	19	192	4.5	234	0.463	-2.646
1995	3	21	231	4.3	226	0.000	-2.962
1995	3	22	230	4.3	251	-0.130	-3.217
1995	3	24	231	4.1	235	-0.349	-3.456
1995	3	24	40	4.1	160	1.368	-2.550
1995	4	1	290	3.7	253	-1.336	-4.437
1995	4	1	33	4.6	208	1.514	-2.163
1995	4	2	200	4.6	238	0.546	-2.487
1995	4	4	225	4.2	253	-0.266	-3.437
1995	4	5	150	4.3	272	0.093	-3.416
1995	4	6	33	4.4	226	1.013	-2.762
1995	4	7	45	4.3	265	0.458	-3.351
1995	4	7	210	4.1	211	-0.096	-3.197
1995	4	7	135	4.4	169	1.145	-2.076
1995	4	8	175	4.2	257	-0.054	-3.476
1995	4	9	250	4.4	237	-0.009	-2.877
1995	4	10	101	4.6	214	1.225	-2.231
1995	4	11	229	4.3	263	-0.190	-3.333
1995	4	14	113	4.4	218	0.833	-2.675
1995	4	16	238	3.9	211	-0.561	-3.597
1995	4	18	229	4.0	238	-0.504	-3.687
1995	4	18	33	4.4	283	0.463	-3.316
1995	4	24	106	4.2	295	-0.074	-3.821
1995	4	26	33	4.5	207	1.376	-2.351
1995	4	28	33	4.4	173	1.656	-2.130
1995	5	5	33	4.5	284	0.605	-3.125
1995	5	5	160	4.4	248	0.376	-2.988
1995	5	6	95	4.2	181	0.988	-2.635
1995	5	7	224	4.0	234	-0.456	-3.646
1995	5	16	186	5.9	236	2.581	0.133
1995	5	18	221	4.4	224	0.216	-2.740
1995	5	25	50	4.3	74	3.159	-0.783
1995	5	25	150	4.0	240	-0.120	-3.708
1995	6	1	40	4.0	51	3.457	-0.696
1995	6	11	27	5.7	245	2.774	-0.358
1995	6	11	33	4.5	263	0.793	-2.933
1995	6	13	33	4.5	275	0.684	-3.044
1995	6	14	204	3.8	234	-0.650	-4.046
1995	7	3	200	4.2	240	-0.066	-3.308
1995	7	5	204	4.3	251	-0.002	-3.217
1995	7	6	122	4.4	269	0.374	-3.189
1995	7	11	101	4.3	174	1.177	-2.344
1995	7	12	33	4.4	268	0.597	-3.179
1995	7	13	215	4.4	238	0.169	-2.887

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1995	7	20	33	4.5	209	1.352	-2.374
1995	7	23	129	4.8	225	1.297	-1.951
1995	8	2	33	3.7	236	-0.143	-4.267
1995	8	9	222	4.1	248	-0.374	-3.588
1995	8	9	241	4.0	229	-0.521	-3.594
1995	8	13	110	3.9	275	-0.383	-4.244
1995	8	17	233	5.6	232	1.907	-0.425
1995	8	21	224	3.7	244	-0.962	-4.348
1995	8	24	33	4.0	202	0.685	-3.293
1995	8	25	33	4.0	281	-0.119	-4.098
1995	8	31	233	4.6	247	0.327	-2.578
1995	9	2	245	3.9	228	-0.687	-3.783
1995	9	2	245	3.9	262	-0.860	-4.123
1995	9	10	198	4.0	236	-0.331	-3.667
1995	9	20	222	4.1	256	-0.418	-3.666
1995	9	20	150	4.1	231	0.098	-3.415
1995	9	22	172	3.8	250	-0.593	-4.207
1995	10	6	33	4.1	204	0.811	-3.117
1995	10	8	33	3.9	268	-0.153	-4.179
1995	10	14	93	4.4	209	1.009	-2.574
1995	10	18	222	6.3	245	2.943	0.842
1995	10	18	81	4.4	223	0.918	-2.730
1995	10	19	200	4.1	261	-0.343	-3.714
1995	10	20	100	4.2	229	0.490	-3.194
1995	10	20	180	4.5	252	0.406	-2.827
1995	10	22	63	4.4	104	2.565	-0.986
1995	10	30	107	4.2	255	0.238	-3.456
1995	11	2	202	3.7	256	-0.923	-4.466
1995	11	2	101	4.4	208	0.982	-2.563
1995	11	7	238	4.3	238	-0.102	-3.087
1995	11	10	195	4.2	246	-0.078	-3.368
1995	11	11	197	3.9	272	-0.696	-4.216
1995	11	15	203	4.0	296	-0.712	-4.229
1995	11	16	81	4.9	234	1.562	-1.846
1995	11	21	217	3.5	232	-1.157	-4.625
1995	11	21	124	4.0	295	-0.426	-4.221
1995	11	23	125	4.0	190	0.423	-3.149
1995	11	23	224	4.0	232	-0.445	-3.625
1995	11	28	48	4.9	98	3.577	-0.088
1995	11	29	130	4.6	198	1.222	-2.046
1995	12	1	100	3.7	242	-0.377	-4.328
1995	12	3	200	3.7	182	-0.457	-3.648
1995	12	8	100	4.2	295	-0.059	-3.821
1995	12	8	118	4.9	189	1.824	-1.336
1995	12	8	10	4.2	161	1.573	-2.365
1995	12	9	100	4.1	250	0.154	-3.607
1995	12	10	200	3.9	259	-0.631	-4.095
1995	12	11	33	4.0	53	3.543	-0.624
1995	12	13	200	3.9	225	-0.424	-3.751
1995	12	15	200	4.0	271	-0.553	-4.007
1995	12	19	207	3.9	234	-0.516	-3.846
1995	12	22	203	4.0	227	-0.302	-3.572
1995	12	24	122	3.9	224	-0.011	-3.740
1995	12	25	228	5.6	253	1.819	-0.637
1995	12	27	181	3.5	234	-0.980	-4.646
1995	12	30	33	3.8	94	2.147	-2.050
1996	1	3	100	4.6	209	1.277	-2.174
1996	1	3	150	3.6	228	-0.630	-4.383
1996	1	4	220	4.0	239	-0.463	-3.697
1996	1	10	100	4.1	187	0.747	-2.911
1996	1	12	33	4.0	100	2.314	-1.700
1996	1	14	33	3.9	209	0.452	-3.574
1996	1	14	33	3.7	222	0.006	-4.119
1996	1	14	33	4.1	132	1.840	-2.114
1996	1	17	100	4.3	188	1.036	-2.524
1996	1	19	33	4.7	196	1.807	-1.822
1996	1	19	200	3.9	258	-0.625	-4.085

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1996	1	23	184	4.2	244	-0.011	-3.348
1996	1	26	208	4.0	247	-0.448	-3.778
1996	1	26	33	3.7	234	-0.122	-4.246
1996	1	28	33	3.8	297	-0.555	-4.638
1996	2	8	200	3.8	234	-0.629	-4.046
1996	2	10	100	4.0	177	0.701	-2.983
1996	2	10	150	3.6	246	-0.764	-4.568
1996	2	10	150	3.2	204	-1.043	-4.917
1996	2	13	150	3.9	141	0.520	-2.663
1996	2	14	33	3.9	153	1.197	-2.848
1996	2	17	159	4.0	213	0.036	-3.419
1996	2	18	33	3.9	207	0.476	-3.551
1996	2	18	33	4.3	125	2.265	-1.592
1996	2	19	100	4.1	61	2.206	-1.883
1996	2	20	17	4.8	134	2.908	-0.748
1996	2	20	100	4.0	238	0.109	-3.687
1996	2	23	33	3.9	150	1.243	-2.803
1996	2	26	33	3.9	213	0.406	-3.619
1996	3	7	151	3.8	209	-0.188	-3.774
1996	3	9	200	3.5	233	-1.073	-4.636
1996	3	9	33	3.7	188	0.407	-3.724
1996	3	16	252	4.0	219	-0.531	-3.486
1996	3	16	33	4.0	208	0.614	-3.363
1996	3	23	231	3.6	257	-1.217	-4.676
1996	3	25	18	4.6	232	1.266	-2.425
1996	4	4	199	3.7	248	-0.860	-4.388
1996	4	8	244	4.4	226	0.078	-2.762
1996	4	10	116	3.7	275	-0.702	-4.644
1996	4	12	219	4.2	239	-0.158	-3.297
1996	4	12	199	4.1	232	-0.161	-3.425
1996	4	13	105	4.0	186	0.579	-3.099
1996	4	13	236	4.0	226	-0.478	-3.562
1996	4	17	92	4.0	174	0.781	-2.944
1996	4	18	150	3.8	201	-0.120	-3.682
1996	4	21	36	4.0	182	0.928	-3.048
1996	4	23	114	4.6	222	1.093	-2.319
1996	4	25	135	4.0	229	0.036	-3.594
1996	4	29	153	4.0	224	-0.015	-3.540
1996	4	30	120	3.9	208	0.138	-3.563
1996	5	1	229	3.7	230	-0.911	-4.204
1996	5	3	114	3.8	266	-0.475	-4.361
1996	5	4	150	3.5	206	-0.609	-4.340
1996	5	8	33	4.1	136	1.772	-2.181
1996	5	12	130	4.0	286	-0.380	-4.142
1996	5	14	270	3.5	253	-1.537	-4.837
1996	5	19	26	4.1	241	0.415	-3.518
1996	5	19	214	4.4	231	0.214	-2.815
1996	5	19	100	3.9	233	0.003	-3.836
1996	5	24	39	4.1	80	2.867	-1.175
1996	5	26	33	3.6	214	-0.055	-4.231
1996	5	31	227	3.5	239	-1.249	-4.697
1996	6	1	200	4.0	256	-0.463	-3.866
1996	6	2	123	3.7	294	-0.865	-4.812
1996	6	12	197	3.6	279	-1.188	-4.880
1996	6	15	33	3.9	207	0.476	-3.551
1996	6	16	200	3.4	280	-1.506	-5.289
1996	6	17	238	4.1	225	-0.334	-3.351
1996	6	21	176	3.8	289	-0.865	-4.569
1996	7	6	169	4.0	240	-0.211	-3.708
1996	7	7	200	3.8	245	-0.696	-4.158
1996	7	7	158	4.2	222	0.274	-3.119
1996	7	8	147	3.8	278	-0.682	-4.471
1996	7	11	100	4.0	226	0.217	-3.562
1996	7	13	33	4.2	234	0.628	-3.246
1996	7	13	200	3.5	238	-1.104	-4.687
1995	7	14	97	4.0	272	-0.170	-4.016
1996	7	14	232	4.2	221	-0.129	-3.108

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1996	7	14	289	3.3	212	-1.758	-4.808
1996	7	15	217	4.8	230	0.804	-2.004
1996	7	22	150	3.3	249	-1.237	-5.198
1996	7	24	33	5.5	296	2.003	-1.229
1996	7	27	250	3.5	219	-1.270	-4.486
1996	7	31	210	3.8	240	-0.717	-4.108
1996	7	31	109	4.1	173	0.837	-2.730
1996	8	1	203	4.4	247	0.177	-2.978
1996	8	3	45	3.7	70	2.426	-1.820
1996	8	3	200	3.7	266	-0.973	-4.561
1996	8	5	214	3.9	239	-0.582	-3.897
1996	8	6	152	3.9	219	-0.121	-3.686
1996	8	8	33	4.8	148	2.625	-0.972
1996	8	10	33	3.8	271	-0.330	-4.407
1996	8	10	33	3.8	284	-0.445	-4.525
1996	8	13	111	3.6	168	0.125	-3.662
1996	8	14	88	4.1	223	0.442	-3.330
1996	8	16	33	4.0	288	-0.180	-4.160
1996	8	18	125	4.0	242	-0.025	-3.728
1996	8	22	157	4.2	243	0.125	-3.338
1996	8	25	242	4.1	238	-0.422	-3.487
1996	8	30	72	4.4	269	0.520	-3.189
1996	9	2	106	4.3	190	0.983	-2.549
1996	9	2	222	4.4	258	0.021	-3.085
1996	9	2	150	4.2	261	0.026	-3.514
1996	9	4	200	4.5	232	0.433	-2.625
1996	9	7	200	3.9	241	-0.522	-3.918
1996	9	14	119	5.9	196	3.253	0.578
1996	9	27	46	4.7	271	1.003	-2.607
1996	9	30	107	4.5	190	1.278	-2.149
1996	10	1	33	4.7	233	1.389	-2.236
1996	10	4	190	4.2	242	-0.028	-3.328
1996	10	6	113	4.5	191	1.234	-2.161
1996	10	22	108	4.6	183	1.492	-1.861
1996	10	26	300	4.3	238	-0.423	-3.087
1996	11	1	200	4.5	230	0.446	-2.604
1996	11	3	156	4.1	236	0.031	-3.467
1996	11	10	200	4.1	250	-0.277	-3.607
1996	11	10	247	4.2	238	-0.299	-3.287
1996	11	14	61	4.7	249	1.176	-2.398
1996	11	15	100	4.4	241	0.682	-2.918
1996	11	15	114	4.5	265	0.582	-2.951
1996	11	17	200	4.0	250	-0.427	-3.807
1996	11	30	252	4.7	225	0.489	-2.151
1996	12	2	250	4.2	238	-0.314	-3.287
1996	12	4	200	3.1	234	-1.679	-5.446
1996	12	14	100	3.7	217	-0.149	-4.064
1996	12	17	175	4.8	250	0.893	-2.207
1996	12	18	215	4.1	234	-0.258	-3.446
1996	12	20	150	4.5	222	0.766	-2.519
1996	12	20	200	3.2	234	-1.529	-5.246
1996	12	21	174	4.7	234	0.856	-2.246
1996	12	21	150	3.6	238	-0.705	-4.487
1996	12	23	132	3.2	272	-1.484	-5.616
1996	12	24	178	3.7	219	-0.563	-4.086
1996	12	24	150	3.9	223	-0.141	-3.730
1996	12	29	50	4.3	68	3.293	-0.652
1996	12	29	250	3.9	240	-0.774	-3.903
1997	1	10	200	4.8	230	0.896	-2.004
1997	1	11	212	4.5	247	0.282	-2.778
1997	1	12	100	3.7	183	0.188	-3.661
1997	1	13	150	3.2	278	-1.593	-5.671
1997	1	17	250	3.5	241	-1.379	-4.718
1997	1	18	93	4.4	241	0.707	-2.918
1997	1	19	234	3.2	238	-1.731	-5.287
1997	1	19	121	4.2	266	0.100	-3.561
1997	1	24	213	3.9	250	-0.640	-4.007
1997	1	26	250	3.4	242	-1.534	-4.928
1997	1	26	100	4.2	221	0.563	-3.108
1997	1	30	150	3.5	243	-0.892	-4.735
1997	2	7	158	4.7	247	0.842	-2.378
1997	2	7	100	4.4	181	1.259	-2.235
1997	2	8	174	3.1	241	-1.592	-5.518
1997	2	13	226	3.0	233	-1.961	-5.636
1997	2	18	227	4.3	225	0.027	-2.951
1997	2	21	150	4.1	225	0.143	-3.351
1997	2	22	217	3.2	231	-1.602	-5.215
1997	2	23	126	4.3	195	0.822	-2.610
1997	2	25	227	4.5	247	0.207	-2.778
1997	3	3	48	4.5	85	3.246	-0.599
1997	3	8	33	3.7	264	-0.416	-4.542
1997	3	13	243	3.9	244	-0.758	-3.948
1997	3	19	50	4.9	63	4.307	0.656
1997	3	25	133	4.1	197	0.464	-3.034
1997	3	26	221	3.8	216	-0.639	-3.853
1997	3	28	226	3.6	232	-1.056	-4.425
1997	3	30	150	3.2	208	-1.075	-4.963
1997	4	9	172	4.0	230	-0.156	-3.604
1997	4	9	103	4.3	254	0.410	-3.247
1997	4	13	300	3.6	281	-1.650	-4.898
1997	4	21	154	4.8	299	0.650	-2.655
1997	4	25	202	3.5	246	-1.162	-4.768
1997	4	25	33	3.6	95	1.824	-2.474
1997	4	27	200	3.1	260	-1.837	-5.704
1997	4	27	200	3.4	237	-1.248	-4.877
1997	4	28	33	3.8	142	1.221	-2.879
1997	4	28	200	3.1	260	-1.837	-5.704
1997	4	30	235	3.4	261	-1.557	-5.114
1997	4	30	151	3.5	229	-0.792	-4.594
1997	5	4	33	3.9	215	0.384	-3.642
1997	5	8	129	3.9	221	-0.020	-3.708
1997	5	10	33	3.3	140	0.504	-3.847
1997	5	13	196	6.5	231	3.461	1.385
1997	5	13	200	4.2	230	-0.004	-3.204
1997	5	15	184	5.0	231	1.274	-1.615
1997	5	19	33	4.0	119	1.927	-2.083
1997	5	19	33	3.9	284	-0.295	-4.325
1997	5	28	126	4.9	232	1.403	-1.825
1997	5	31	33	5.0	223	1.945	-1.530
1997	6	2	99	5.0	184	2.133	-1.074
1997	6	4	119	4.4	212	0.858	-2.608
1997	6	6	150	3.8	240	-0.420	-4.108
1997	6	11	213	3.4	249	-1.385	-4.998
1997	6	11	241	4.0	232	-0.536	-3.625
1997	6	13	100	3.8	227	-0.092	-3.972
1997	6	14	100	4.0	174	0.733	-2.944
1997	6	22	200	3.3	244	-1.440	-5.148
1997	6	24	33	3.9	232	0.199	-3.825
1997	6	24	214	3.6	242	-1.049	-4.528
1997	6	25	33	4.9	183	2.272	-1.261
1997	6	28	117	4.2	210	0.586	-2.986
1997	6	29	100	4.1	262	0.053	-3.723
1997	7	3	242	4.1	224	-0.350	-3.340
1997	7	6	150	4.0	225	-0.007	-3.551
1997	7	9	228	3.8	223	-0.717	-3.930
1997	7	14	89	4.3	268	0.336	-3.379
1997	7	19	33	3.7	60	2.881	-1.405
1997	7	26	234	4.6	250	0.306	-2.607
1997	7	28	150	3.9	221	-0.126	-3.708
1997	-7	29	10	4.8	275	1.150	-2.444
1997	8	6	193	4.9	234	1.058	-1.846
1997	8	6	198	4.5	232	0.444	-2.625
1997	8	7	200	4.0	227	-0.286	-3.572
1997	8	9	199	3.8	236	-0.636	-4.067

Estimated Earthquake Intensity Felt at Munda Damsite

Year	Month	Day	Focal depth (km)	Magnitude in Ritcher Scale (M)	Epicentral distance (km)	Intensity at Damsite by Cornell Imm	Intensity at Damsite by Kawasumi Ij
a	b	c	d	e	f	g	h
1997	8	13	100	5.0	285	1.218	-2.134
1997	8	16	36	4.3	279	0.345	-3.480
1997	8	17	93	4.1	209	0.559	-3.174
1997	8	19	100	4.1	197	0.645	-3.034
1997	8	21	211	4.5	247	0.287	-2.778
1997	9	1	250	4.2	243	-0.339	-3.338
1997	9	1	200	4.0	252	-0.439	-3.827
1997	9	5	16	4.0	148	1.470	-2.572
1997	9	7	224	4.1	222	-0.239	-3.319
1997	9	8	233	4.1	259	-0.487	-3.695
1997	9	18	200	3.4	229	-1.198	-4.794
1997	9	19	100	4.5	200	1.215	-2.270
1997	9	22	300	3.6	267	-1.592	-4.770
1997	9	28	81	3.5	177	0.059	-3.983
1997	10	15	200	4.2	264	-0.211	-3.542
1997	10	16	100	4.5	217	1.051	-2.464
1997	10	18	150	3.7	287	-0.905	-4.751
1997	10	19	205	4.8	233	0.851	-2.036
1997	10	22	150	4.1	229	0.113	-3.394
1997	10	23	150	3.9	194	0.086	-3.398
1997	10	30	100	4.7	233	1.203	-2.236
1997	10	31	101	5.0	192	2.040	-1.173
1997	11	1	207	4.8	238	0.810	-2.087
1997	11	9	33	4.3	77	3.310	-0.635
1997	11	21	100	3.9	216	0.160	-3.653
1997	11	24	120	4.2	235	0.354	-3.256
1997	11	26	250	3.7	256	-1.154	-4.466
1997	12	11	150	3.3	153	-0.479	-4.048
1997	12	11	33	4.3	172	1.520	-2.317
1997	12	14	100	3.1	253	-1.372	-5.637
1997	12	14	100	3.1	226	-1.133	-5.362
1997	12	15	217	4.5	239	0.303	-2.697
1997	12	17	207	6.3	231	3.102	0.985
1997	12	18	250	3.6	248	-1.264	-4.588
1997	12	19	227	3.0	221	-1.901	-5.508
1997	12	20	131	4.2	222	0.412	-3.119
1997	12	21	128	4.0	87	1.374	-2.952
1997	12	24	207	3.6	249	-1.055	-4.598
1997	12	25	250	4.5	203	0.309	-2.305
1997	12	28	200	4.2	251	-0.133	-3.417
1997	12	28	200	3.2	118	-0.828	-3.664
1997	12	31	33	4.0	101	2.292	-1.722
1998	1	7	229	4.2	237	-0.199	-3.277
1998	1	8	239	4.2	229	-0.210	-3.194
1998	1	16	100	4.1	202	0.596	-3.093
1998	1	17	200	4.3	234	0.121	-3.046
1998	1	20	216	4.4	237	0.169	-2.877
1998	1	20	100	4.8	228	1.399	-1.983
1998	1	24	284	3.4	246	-1.726	-4.968
1998	1	28	100	4.0	287	-0.297	-4.151
1998	2	3	265	3.2	266	-2.024	-5.561
1998	2	5	100	3.7	240	-0.359	-4.303
1998	2	6	200	3.5	223	-1.011	-4.530
1998	2	9	79	4.7	262	1.014	-2.523
1998	2	11	128	3.4	194	-0.531	-4.398
1998	2	11	33	3.6	223	-0.155	-4.330
1998	2	11	100	3.6	241	-0.518	-4.518
1998	2	14	218	5.1	223	1.289	-1.330
1998	2	16	217	4.0	239	-0.447	-3.697
1998	2	18	298	3.5	265	-1.724	-4.951
1998	2	18	238	3.8	246	-0.893	-4.168
1998	2	18	200	3.5	196	-0.844	-4.222
1998	2	20	235	6.4	237	3.069	1.123
1998	2	22	203	4.3	236	0.093	-3.067
1998	2	24	150	3.6	217	-0.545	-4.264
1998	2	24	150	3.5	207	-0.617	-4.351
1998	2	26	200	3.4	265	-1.417	-5.151
1998	2	27	115	4.5	287	0.410	-3.151
1998	3	1	200	4.6	239	0.540	-2.497
1998	3	2	200	3.0	267	-2.029	-5.970
1998	3	7	100	3.4	86	0.867	-3.632
1998	3	8	100	3.3	225	-0.824	-4.951
1998	3	9	100	3.7	243	-0.385	-4.338
1998	3	9	238	4.6	240	0.338	-2.508
1998	3	12	216	3.9	250	-0.655	-4.007
1998	3	14	150	3.7	229	-0.487	-4.194
1998	3	16	268	3.5	226	-1.403	-4.562
1998	3	16	250	2.9	227	-2.210	-5.772
1998	3	16	232	4.1	239	-0.375	-3.497
1998	3	18	110	4.1	190	0.661	-2.949
1998	3	18	62	3.3	261	-1.037	-5.314
1998	3	21	227	6.0	255	2.413	0.144
1998	3	22	200	3.6	264	-1.111	-4.742
1998	3	23	120	3.9	258	-0.283	-4.085
1998	3	23	226	4.0	248	-0.544	-3.788
1998	3	25	108	4.2	188	0.842	-2.724
1998	3	28	100	3.9	279	-0.385	-4.280
1998	3	31	128	4.4	213	0.803	-2.619
1998	4	3	72	5.0	62	4.061	0.468
1998	4	10	200	3.1	214	-1.555	-5.231
1998	4	11	200	3.1	238	-1.704	-5.487
1998	4	13	175	3.5	238	-0.977	-4.687
1998	4	16	213	3.6	253	-1.108	-4.637
1998	4	17	150	3.5	217	-0.695	-4.464
1998	4	21	150	3.8	243	-0.442	-4.138
1998	4	23	213	3.4	235	-1.304	-4.856
1998	4	23	126	4.8	223	1.328	-1.930
1998	4	26	300	3.6	248	-1.514	-4.588
1998	4	26	250	4.1	246	-0.504	-3.568
1998	4	28	200	3.2	293	-1.883	-5.804
1998	4	28	114	4.2	212	0.582	-3.008
1998	5	4	259	3.5	223	-1.340	-4.530
1998	5	8	200	3.5	259	-1.231	-4.895
1998	5	9	100	3.7	295	-0.809	-4.821
1998	5	9	77	4.8	278	1.033	-2.471
1998	5	11	200	3.8	247	-0.709	-4.178
1998	5	14	179	3.9	224	-0.302	-3.740
1998	5	14	33	4.2	273	0.252	-3.626
1998	5	18	190	3.6	242	-0.928	-4.528
1998	5	18	137	4.1	252	-0.003	-3.627
1998	5	23	250	4.0	228	-0.565	-3.583
1998	5	24	33	3.8	251	-0.143	-4.217
1998	6	18	33	4.3	219	0.939	-2.886
1998	6	30	201	4.7	238	0.691	-2.287
1998	7	12	33	4.5	138	2.338	-1.414

HY HYDROLOGICAL INVESTIGATION

HY1.

CLIMATE

PESHAWAR

NORMALS OF MAXIMUM AND MINIMUM TEMPERATURE

PERIOD: 1961 - 1990

	MAXIMUM TEMPERATURE											MINIMUM TEMPERATURE										
	Mean			Extremes								Mean			Extremes							
MONTH	Daily	Monthly		Hghest recorded						Lowest		Daily	Monthly		Highest		Lowest recorded					
	Max	High	Low	1931 - 60		1961 - 1990		to 1990		1961 - 90		Main	High	Low	1961 - 1990		1931 - 90		1961 - 1990		to 1990	
		Max	Max	Bal	Date	Val	Date	Val	Date	Val	Date		Min	Min	Val	Date	Val	Date	Val	Date	Val	Date
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
JAN	18.3	23.3	11.6	24	21/1946	26.5	24/1990	26.5	24/1990	8.3	21/1962	4.0	8.4	0.7	11.5	2/1988	-3	22/1934	-3.9	7/1970	-3.9	7/1970
FEB	19.5	24.9	12.0	30	28/1953	30.0	26/1978	30.0	26/1978	8.3	15/1972	6.3	10.9	2.0	13.3	6/1966	-1	12/1950	-1.0	8/1978	-2	3/1905
MAR	23.7	30.3	15.2	34	31/1931	36.0	19/1974	37	26/1892	10.5	5/1982	11.2	16.1	6.2	19.0	30/1977	2	5/1945	2.8	6/1961	-1	1/1905
APR	30.0	37.1	20.4	42	29/1941	41.0	26/1979	42	29/1941	14.8	13/1983	16.4	22.1	10.6	25.0	22/1974	7	9/1936	6.7	2/1968	5	8/1918
MAY	35.9	42.1	26.5	48	31/1941	47.2	31/1984	48	31/1941	17.2	23/1965	21.3	27.2	15.9	32.8	30/1962	12	7/1960	13.3	1/1969	11	2/1881
JUN	40.4	45.4	33.2	48	9/1947	48.0	20/1986	49	17/1914	28.2	18/1982	25.7	30.6	20.8	34.4	21/1969	13	8/1949	17.0	13/1981	13	8/1949
JUL	37.7	43.2	29.9	46	6/1947	46.1	1/1964	50	5/1920	26.0	6/1978	26.6	30.6	21.9	32.0	8/1976	21	10/1955	18.3	23/1968	18.3	23/1968
AUG	35.7	39.9	29.0	43	3/1947	46.0	12/1987	48	9/1915	23.0	3/1976	25.7	29.1	21.9	30.8	1/1983	19	27/1954	20.0	30/1988	19	27/1954
SEP	35.0	38.3	29.5	41	4/1940	42.0	25/1976	43	2/1920	22.8	20/1972	22.7	26.5	17.9	28.5	(3)/1987	14	29/1940	13.3	28/1982	13.3	28/1982
OCT	31.2	35.7	24.4	38	5/1951	38.3	5/1971	38.3	5/1971	16.0	18/1990	16.1	20.6	12.1	23.0	1/1978	8	29/1947	9.4	28/1972	6	30/1916
NOV	25.6	30.4	18.5	33	2/1933	35.0	3/1979	35.0	3/1979	12.0	27/1986	9.6	14.0	5.0	17.0	1/1979	1	24/1949	2.0	28/1975	0	30/1912
DEC	20.1	25.3	12.6	28	4/1932	29.0	(3)/1979	29.0	(3)/1979	8.9	28/1967	4.9	9.2	1.6	13.0	18/1989	-2	13/1937	-1.3	25/1984	-2	13/1937
YEAR	29.4	34.7	21.9	48	9 JUN 1947	48.0	20 JUN 1986	50	5 JUN 1920	8.3	15 FEB 1972	15.9	20.4	11.4	34.4	21 JUN 1969	-3	22 JAN 1934	-3.9	7 JAN 1970	-3.9	7 JAN 1970
Begin	1961	1961	1961			1961				1961		1961	1961	1961	1961				1961			
No.of Years	30	30	30	30		30		110		30		30	30	30	30		30		30		110	

PESHAWAR
NORMALS OF WIND SPEED AND DIRECTION

PERIOD: 1961 - 1988

MONTH	WIND FREQUENCY (Percent) SPEED IN KNOT RANGES: Calm	1 to 3	4 to 6	7 to 10	11 to 16	17 to 21	22 to 27	28 to 33	> 33	DIRECTION FROM: N	NE	E	SE	S	SW	W	NW
77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
JAN	52	41	4	3	.1	.1	0	0	0	6	3	3	8	18	1	1	7
FEB	40	49	6	4	1	.4	0	0	0	8	5	2	6	22	4	2	11
MAR	36	49	6	6	2	1	.1	0	0	11	5	2	7	22	4	3	12
APR	36	45	9	8	1	.3	0	0	0	11	8	3	7	20	5	3	8
MAY	34	42	12	9	2	1	.1	.1	0	11	12	5	8	11	4	3	11
JUN	25	44	13	13	3	1	.1	.1	.1	19	16	6	7	7	3	3	13
JUL	17	52	15	15	1	.3	.3	0	0	26	16	3	6	5	1	1	26
AUG	20	54	13	12	1	.3	.1	.0	.1	25	18	2	5	4	1	3	21
SEP	35	53	6	5	.1	.1	0	0	0	20	12	4	4	3	1	3	17
OCT	57	39	2	1	.4	0	0	0	0	12	8	3	3	8	1	2	6
NOV	59	38	2	1	.1	.1	0	0	0	8	5	2	4	17	1	1	4
DEC	69	30	1	1	0	0	0	0	0	4	3	1	3	17	2	1	1
YEAR	40	45	7	7	1	.4	.1	0	0	13	9	3	6	13	2	2	11
Begin					1976								1976				
No of years					3								3				

MONTH	MEAN WIND AT SYNOPTIC HOURS SPEED (knots): 00 GMT	03 GMT	06 GMT	09 GMT	12 GMT	15 GMT	18 GMT	21 GMT	DIRECTION (Degrees & 8 Points): 00 GMT	03 GMT	06 GMT	09 GMT	12 GMT	15 GMT	18 GMT	21 GMT	MEAN WIND SPD Kts	MEAN WIND DIR Deg& 8 Pt	STEADINESS %	MAX WIND SPD Kts
77	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114
JAN	1.4	1.4	1.5	2.9	1.7	0.9	1.5	1.2	169	176	107	358	349	195	174	178	1.6	170	14	17
	1.5	1.3			1.4				S	S	VRB	N	N	VRB	S	S	1.7	VRB		
FEB	2.0	1.5	2.5	4.2	3.0	1.5	1.5	1.3	189	195	351	341	345	219	192	176	2.2	278	13	21
	1.7	1.5			2.7				S	S	N	N	N	SW	S	S	2.0	VRB		
MAR	1.8	1.7	2.8	4.6	3.8	1.9	2.2	2.1	200	208	350	343	328	213	275	183	2.6	292	17	24
	2.0	1.5			3.2				S	SW	N	N	NW	SW	W	S	2.4	VRB		
APR	2.0	1.6	2.7	3.9	3.3	2.0	2.4	2.2	181	204	7	11	306	220	209	203	2.5	238	7	21
	1.9	1.3			3.7				S	SW	N	N	VRB	VRB	SW	SW	2.4	VRB		
MAY	1.8	1.9	4.1	4.9	4.9	2.0	1.9	1.9	207	290	12	22	14	5	304	216	2.9	355	17	30
	1.8	1.7			4.6				SW	VRB	NE	N	VRB	VRB	NW	SW	3.0	VRB		
JUN	2.4	3.0	4.1	5.3	6.6	3.3	2.7	2.3	323	341	28	27	53	141	309	322	3.7	14	34	35
	2.0	2.4			5.4				NW	N	N	NE	VRB	VRB	VRB	NW	3.0	N		
JUL	2.9	2.9	3.5	5.2	5.3	3.5	2.9	2.7	335	344	10	23	24	13	345	332	3.6	1	51	26
	2.5	2.8			5.1				NW	N	N	NE	NE	N	N	NW	3.1	N		
AUG	2.8	2.9	3.3	4.2	4.9	2.9	2.5	2.9	340	345	13	27	40	349	330	352	3.3	5	54	35
	2.2	2.5			4.4				NW	N	N	NE	NE	N	NW	N	2.7	N		
SEP	1.5	2.0	2.5	3.2	4.1	1.7	1.7	1.5	321	337	21	47	36	1	331	317	2.3	5	50	20
	1.6	1.7			3.6				NW	NW	N	NE	NE	N	NW	NW	2.1	N		
OCT	0.9	0.8	1.7	2.4	1.6	1.0	1.0	1.2	210	239	17	49	32	352	315	238	1.3	18	25	16
	1.2	0.8			1.6				SW	VRB	N	NE	NE	N	NW	VRB	1.5	N		
NOV	1.2	1.1	1.3	2.0	1.0	1.0	0.8	1.1	185	185	63	27	352	156	199	195	1.2	151	12	17
	1.5	0.9			0.7				S	S	VRB	NE	N	SE	S	VRB	1.4	VRB		
DEC	0.9	0.7	1.0	1.6	0.4	0.8	0.7	0.9	183	130	120	34	215	163	182	183	0.9	174	38	10
	1.4	1.2			0.7				S	S	VRB	VRB	VRB	S	S	S	1.4	S		
YEAR	1.8	1.8	2.6	3.7	3.4	1.9	1.8	1.8	245	306	15	17	20	341	288	263	2.3	360	28	35
	1.8	1.6			3.1				SW	NW	N	N	N	N	W	W	2.2	N		
Begin					1976							1976					1976	1976	1976	1976
	1961	1961			1961												1961			
No of					3							3					3	3	3	3
years	28	28			28												28			

PESHAWAR
NORMALS OF CLOUD AND PRECIPITATION

PERIOD : 1961 - 1990

MONTH	CLOUD AMOUNT (Oktas)						PRECIPITATION (mm)			
	All cloud			Low cloud			Mean Monthly Total			Mean No of rainy days
	00	03	12	00	03	12	03-12	12-03	03-03	days
48	49	50	51	52	53	54	55	56	57	58
JAN	2.6	3.4	3.6	0.5	0.8	0.9	9.4	16.6	26.0	2.1
FEB	3.0	3.7	4.2	0.8	1.1	1.4	18.2	24.5	42.7	3.5
MAR	3.3	4.1	4.8	1.1	1.3	1.9	29.2	49.2	78.4	5.7
APR	3.2	3.4	4.9	0.8	0.9	1.9	13.9	35.0	48.9	3.8
MAY	2.3	2.0	3.9	0.7	0.5	1.6	9.8	17.2	27.0	2.5
JUN	1.6	1.4	2.8	0.5	0.4	1.3	2.1	5.6	7.7	0.8
JUL	3.5	3.3	3.5	1.6	1.6	2.0	15.0	27.4	42.3	2.4
AUG	3.5	3.6	3.7	1.5	1.9	2.1	28.5	39.2	67.7	3.3
SEP	1.4	1.5	2.6	0.5	0.7	1.3	6.0	11.9	17.9	1.5
OCT	0.7	1.1	2.1	0.2	0.3	0.7	2.7	6.9	9.7	0.8
NOV	1.1	1.9	2.3	0.2	0.3	0.5	4.8	7.5	12.3	1.2
DEC	2.1	3.2	3.4	0.4	0.6	0.8	9.1	14.1	23.3	1.8
YEAR	2.4	2.7	3.5	0.7	0.9	1.4	148.6	255.2	403.8	29.5
Begin	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961
No.of Years	30	30	30	30	30	30	30	30	30	30

MONTH	PRECIPITATION (mm) — Extremes																	
	Wettest						Driest						Heaviest falls in 24 hrs					
	1931-60		1961-90		to 1990		1931-60		1961-90		to 1990		1931-60		1961-90		to 1990	
	Amt	Year	Amt	Year	Amt	Year	Amt	Year	Amt	Year	Amt	Year	Amt	Date	Amt	Date	Amt	Date
48	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76
JAN	133.6	1942	89.7	1961	133.6	1942	0.8	1956	0	(5)	0.0	+	84.1	8/1942	54.4	14/1979	84.1	8/1942
FEB	129.8	1936	82.9	1979	129.8	1936	0.0	+	56	1985	0.0	+	61.2	27/1944	45.5	3/1980	61.2	27/1944
MAR	197.1	1939	222.6	1978	222.6	1978	16.3	1942	0	1977	0.0	1977	50.3	26/1934	135.1	25/1967	135.1	25/1967
APR	130.6	1957	179.1	1983	186.7	1885	0.0	+	84	1980	0.0	+	54.4	2/1950	84.6	28/1971	84.6	28/1971
MAY	59.2	1931	119.6	1965	131.1	1901	0.0	+	3	1970	0.0	+	24.6	31/1931	54.1	22/1965	97.8	5/1901
JUN	46.0	1956	32.8	1980	97.8	1881	0.0	+	0	(6)	0.0	+	29.7	19/1956	20.3	13/1980	67.3	11/1881
JUL	212.9	1956	208.3	1977	212.9	1956	0.3	1952	13	1963	0.0	+	76.2	17/1956	113.5	17/1977	113.5	17/1977
AUG	185.7	1944	280.2	1976	450.9	1892	0.0	+	0	1987	0.0	1987	72.9	7/1945	102.0	2/1976	150.9	4/1892
SEP	75.4	1959	62.5	1973	120.1	1908	0.5	1939	0	(3)	0.0	+	44.5	16/1959	50.8	1/1970	51.3	2/1924
OCT	70.6	1957	52.2	1990	70.6	1957	0.0	+	0	(6)	0.0	+	37.1	22/1957	33.2	17/1990	37.1	22/1957
NOV	111.5	1959	64.1	1986	111.5	1959	0.0	+	0	(10)	0.0	+	50.5	1/1936	47.5	26/1986	50.5	1/1936
DEC	97.5	1958	145.3	1967	145.3	1967	0.0	+	0	(5)	0.0	+	41.4	13/1958	76.5	27/1967	76.5	27/1967
YEAR	678.9	1959	710.2	1983	710.2	1983	173.7	1952	190	1974	104.6	1902	84.1	8 JAN 1942	135.1	25 MAR 1967	150.9	4 AUG 1892
Begin			1961						1961						1961			
No.of Years	30		30		110		30		30		110		30		30		110	

PESHAWAR

NORMALS OF PRESSURE, TEMPERATURE, HUMIDITY AND VAPOUR PRESSURE

ESTAB : 1866

PERIOD : 1961 - 1990

	PRESSURE (mb or gpm)						TEMPERATURE (°C)											RELATIVE HUMIDITY (%)			VAPOUR PRESSURE (mb)		
	STATION LEVEL			REDUCED TO NEAN SEA LEVEL/GPM			DRY BULB			WET BULB			DEW POINT			MEAN TEMP	MEAN DAILY RANGE						
MONTH	00	03	12	00	03	12	00	03	12	00	03	12	00	03	12			00	03	12	00	03	12
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
JAN	975.2	976.3	974.6	1018.5	1019.7	1016.4	5.7	5.4	16.2	4.0	3.7	10.4	1.4	0.9	3.2	11.2	14.3	75	74	44	6.9	6.7	8.0
FEB	973.4	974.6	972.7	1016.1	1017.4	1014.2	8.1	8.0	17.9	6.4	6.2	11.4	4.0	3.6	3.4	12.9	13.1	76	75	40	8.3	8.0	8.3
MAR	970.8	972.1	969.9	1012.9	1014.2	1010.6	12.5	13.4	22.3	10.6	11.1	15.0	8.4	8.7	8.2	17.4	12.6	78	74	42	11.3	11.4	11.2
APR	967.3	968.6	966.0	1008.5	1009.5	1005.7	17.4	20.2	28.2	14.6	16.3	18.8	12.3	13.3	11.7	23.2	13.6	73	66	38	14.4	15.5	14.2
MAY	962.7	964.1	961.2	1003.1	1003.9	999.7	22.2	26.9	34.3	16.9	19.5	21.2	12.8	14.2	11.9	28.6	14.6	57	48	27	15.1	16.7	14.6
JUN	957.1	958.7	955.0	996.6	997.6	992.8	26.6	30.7	38.7	20.1	22.3	24.0	15.5	17.2	15.1	33.1	14.7	52	46	26	18.2	20.2	18.3
JUL	956.7	958.1	954.6	996.0	997.3	992.8	27.6	29.4	36.1	23.7	24.5	26.3	21.6	22.1	21.4	32.2	11.1	71	66	44	26.2	26.9	26.2
AUG	958.7	960.1	956.9	998.2	999.5	995.3	26.7	27.9	34.1	24.2	24.6	26.7	22.9	23.1	23.3	30.7	10.0	80	76	54	28.0	28.4	28.7
SEP	963.4	964.9	961.8	1003.5	1004.9	1000.6	23.7	25.1	32.8	20.8	21.5	24.1	19.0	19.3	19.5	28.9	12.3	76	71	46	22.3	22.7	23.1
OCT	969.7	971.2	968.4	1011.1	1012.4	1008.1	17.2	18.3	28.4	14.3	14.9	20.0	11.7	11.9	14.2	23.7	15.1	71	67	43	14.0	14.2	16.6
NOV	973.9	975.3	972.9	1016.4	1017.8	1013.8	10.8	10.9	21.3	8.6	8.5	15.3	5.8	5.5	10.1	17.6	16.1	72	70	50	9.5	9.3	12.7
DEC	975.7	976.9	975.0	1018.8	1020.1	1016.8	6.4	6.3	16.4	4.9	4.6	11.5	2.6	2.0	6.1	12.5	15.2	77	75	52	7.4	7.2	9.7
YEAR	967.1	968.4	965.7	1008.3	1009.5	1005.6	17.1	18.5	27.2	14.1	14.8	18.7	11.5	11.8	12.3	22.7	13.6	71	67	42	15.1	15.6	16.0
Begin	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961	1961
No.of Years	30	30	30	30	30	31	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30

SAIDU SHARIF

NORMALS OF PRESSURE, TEMPERATURE, HUMIDITY AND VAPOUR PRESSURE

ESTAB: 1973

PERIOD: 1974 - 1990

MONTH	PRESSURE (mb or gpm)						TEMPERATURE (°C)											RELATIVE HUMIDITY (%)			VAPOUR PRESSURE (mb)		
	STATOPM LEVEL			REDUCED TO MEAN SEA LEVEL/GPM			DRY BULB			WET BULB			DEW POINT			MEAN TEMP	MEAN DAILY RANGE						
	00	03	12	00	03	12	00	03	12	00	03	12	00	03	12			00	03	12	00	03	12
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
JAN	-	912.4	910.6	-	1517.6	1518.2	-	3.6	12.0	-	2.2	7.9	-	0.0	2.9	8.2	12.1	-	78	55	-	6.2	7.7
FEB	-	910.9	909.1	-	1508.4	1508.8	-	5.2	13.6	-	3.7	9.0	-	1.7	4.0	9.5	11.6	-	79	53	-	7.0	8.3
MAR	-	909.5	907.4	-	1505.1	1504.6	-	9.9	17.9	-	7.8	12.2	-	5.4	7.0	13.6	11.7	-	74	51	-	9.1	10.3
APR	906.4	907.1	904.5	1484.0	1495.4	1488.1	13.6	16.4	24.7	11.2	12.9	16.9	9.1	9.9	11.3	19.5	13.9	74	66	44	11.6	12.3	13.8
MAY	903.5	904.1	901.6	1463.4	1477.3	1467.7	17.6	21.9	30.2	13.9	16.0	19.6	11.2	11.7	12.8	24.6	15.4	67	53	36	13.3	13.9	15.2
JUN	899.3	900.0	897.1	1431.9	1446.7	1430.2	22.0	26.4	34.2	16.9	18.8	21.9	13.4	13.7	14.5	28.6	15.5	58	46	32	15.5	16.0	17.5
JUL	898.5	899.4	896.6	1426.9	1438.8	1423.2	23.9	26.1	32.2	20.9	22.0	24.4	19.3	19.7	20.9	28.7	11.0	77	69	52	22.8	23.4	25.0
AUG	900.0	900.9	898.2	1439.7	1449.6	1436.7	22.6	24.5	30.9	20.9	21.8	24.8	19.9	20.5	22.1	27.1	10.5	85	78	60	23.5	24.0	26.9
SEP	904.4	905.1	902.3	1471.8	1485.7	1474.5	18.7	21.2	29.8	16.7	18.0	22.0	15.4	15.9	17.9	24.8	13.6	81	72	50	17.6	18.3	20.7
OCT	-	913.5	910.2	-	1517.9	1512.7	-	15.6	25.4	-	12.2	17.2	-	9.2	11.3	20.2	15.2	-	67	43	-	11.8	13.8
NOV	-	912.4	909.8	-	1528.5	1527.1	-	8.6	18.5	-	6.3	12.2	-	3.6	6.5	14.4	15.3	-	71	47	-	8.0	9.8
DEC	-	913.2	911.2	-	1527.2	1527.3	-	4.6	13.6	-	3.1	9.1	-	1.0	4.3	9.9	13.2	-	77	54	-	6.6	8.3
YEAR	-	907.4	904.9	-	1491.5	1484.9	-	15.3	23.6	-	12.1	16.5	-	9.4	11.3	19.1	13.3	-	69	48	-	13.0	14.8
Begin	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974
No.of Years	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17

Evaporation

Kalam

Kalam
Evaporation in mm/day 1985

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1				5.84	1.52	7.62	11.43	6.86	5.59	7.37	3.05	1.78
2				3.30	1.02	7.87	4.32	6.66	5.33	6.86	1.78	1.52
3				0.76	1.78	8.89	5.59	5.84	6.35	6.35	2.54	1.27
4				0.76	5.08	8.64	11.94	5.59	6.35	6.35	3.05	2.03
5				4.57	5.08	10.67	11.94	5.59	6.10	5.59	3.05	1.78
6				1.27	6.35	9.40	11.94	5.33	5.59	3.30	3.05	1.27
7				0.51	6.35	7.62	10.92	5.33	5.84	3.05	3.56	1.52
8				1.27	6.10	7.11	8.64	0.76	5.33	4.57	3.05	
9				0.76	1.78	8.89	8.13	5.59	6.35	4.32	1.52	
10				0.51	0.76	10.16	10.16	5.59	6.10	0.51	1.27	
11				3.81	5.08	5.08	13.21	5.08	6.35	1.78	2.03	
12				4.06	7.62	9.91	11.18	6.35	5.33	3.30	2.54	
13			2.54	2.54	1.27	6.86	7.62	6.35	6.35	1.52	1.78	
14			3.30	3.05	7.62	9.65	8.89	7.37	4.06	0.76	1.52	
15			3.81	5.08	6.35	8.38	10.67	7.11	4.57	1.52	2.29	
16			2.54	6.10	5.59	7.87	9.91	6.86	5.59	1.02	2.54	
17			1.78	6.35	5.08	8.89	6.86	6.60	7.11	2.29	2.54	
18			2.03	6.35	5.08	8.89	6.86	6.35	5.08	2.79	2.03	
19			3.30	3.56	5.33		2.03	6.35	4.32	4.06	2.54	
20			3.81	1.78	5.59		8.13	4.32	4.32	3.81	2.29	
21			4.32	3.05	7.62		11.18	6.10	4.83	4.32	2.54	
22			5.08	1.52	8.13		8.64	5.84	5.59	4.57	1.52	
23			0.76	5.08	8.13		8.64	7.62	6.10	5.08	1.52	
24			2.54	6.86	3.81	5.59	8.64	7.11	4.83	2.29	1.78	
25			2.79	7.62	3.81	5.59	9.14	8.13	5.08	1.52	2.54	
26			3.56	7.62	8.64	5.84	7.87	4.57	4.57	2.79	2.03	
27			1.02	7.37	6.10	6.60	6.86		3.56	2.29	1.52	
28			1.78	7.62	6.86	7.62	7.37		5.84	2.54	1.27	
29			2.29	0.00	7.11	9.14	8.38		6.60	3.05	0.51	
30			2.79	5.59	5.84	10.41	9.14	3.81	6.35	2.79	0.76	
31			4.57		4.57		4.32	4.32		2.54		
Total			54.61	114.55	161.04	203.20	270.51	163.58	165.35	104.90	64.01	11.18
ave.=			2.87	3.82	5.19	8.13	8.73	5.84	5.51	3.38	2.13	1.60

Kalam
Evaporation in mm/day 1986

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					3.56	2.54	9.65	8.64	5.08	5.59	3.56	
2					0.76	3.05	9.40	7.87	6.10	4.32	3.30	
3					1.78	7.62	10.41	7.62	6.86	5.84	3.30	
4					5.08	4.83	10.16	7.11	5.08	5.33	4.06	
5					7.62	2.54	10.41	5.08	2.79	5.59	2.54	
6					7.37	6.86	10.67	2.54	5.59	5.33	3.05	
7					7.87	6.10	10.67	0.76	3.30	5.08	3.81	
8					4.32	7.11	9.40	4.06	3.56	4.06	3.56	
9					5.59	6.86	9.14	7.62	5.08	5.59	3.05	
10					6.60		5.08	5.08	4.57	5.08	4.06	
11					6.35	5.84	10.16	0.76	3.05	5.59	3.30	
12					5.08	6.86	6.60	2.79	3.05	5.08	3.30	
13					4.83	6.60	5.08	3.05	5.59	5.59	2.54	
14					6.35	7.62	9.40	6.35	4.06	3.81	0.76	
15				4.57	8.89	7.87	9.91	7.62	2.29	2.54	0.25	
16				3.30	8.13	7.11	9.40	6.60	2.54	2.79	0.51	
17				4.06	7.87	6.10	9.65		5.08	2.54	2.03	
18				6.35	8.64	5.59	5.08	6.60	6.35	2.03	2.54	
19				5.84	4.32	8.89	8.89	6.35	5.08	1.27	1.02	
20				6.10	7.87	9.65	1.02	1.78	4.57	2.54	1.27	
21				5.84	6.60	10.16	2.03	1.02	6.10	3.56	2.03	
22				5.84	4.32	12.70	2.79	4.57	5.08	4.06	1.27	
23				2.54	7.62	9.14	7.11	3.81	5.84	4.06	0.76	
24				2.03	8.13	11.43	1.52	5.33	5.08	4.83	1.02	
25				0.76	8.64	9.91	6.35	5.08	5.59	4.83	0.00	
26				0.51	9.40	7.62	8.64	4.83	5.08	4.57	0.00	
27				1.27	7.37	9.14	6.35	1.27	5.08	5.08		
28				0.76	3.81	9.40	7.11	5.33	5.08	3.81		
29				4.32	4.57	10.16	5.84	5.08	4.57	4.32		
30				3.81	5.08	6.86	6.10	2.54	5.08	3.81		
31					6.35		6.35	4.57		2.54		
Total				57.91	190.75	216.15	230.38	141.73	142.24	131.06	56.90	
ave.=				3.62	6.15	7.45	7.43	4.72	4.74	4.23	2.19	

Kalam

Evaporation in mm/day 1987

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					6.86	6.86	5.59	3.30	6.35	4.57	2.54	
2					4.06	5.59	8.64	8.13	7.62	2.03	2.03	
3					7.62	1.02	7.62	6.35	8.13	1.27	3.05	
4					8.38	5.08	7.62	8.13	6.86	4.57	3.56	
5					9.14	7.62	8.38	6.10	8.13	4.83	4.06	
6					7.11	10.16	4.32		7.37	5.08	3.05	
7					4.83	10.92	8.38		7.87	5.59	3.30	
8					2.29	10.16	8.38	9.14	7.62	4.83	3.30	
9					1.02	6.60	7.37	5.84	7.37	5.08	3.05	
10					3.30	8.13	7.37	6.86	4.57	4.06	2.79	
11					5.08	7.11	7.87	8.64	6.35	0.00	3.05	
12					7.11	6.86	4.32	9.14	6.60	0.00	2.54	
13				3.81	5.08	6.60	3.81	9.65	6.35	0.25	1.78	
14				4.83	6.60	5.08	6.10	5.08	7.11	1.78	2.79	
15				5.08	6.86	4.57	5.84	3.05	5.08	1.52	2.79	
16				5.08	7.11	2.54	6.10	5.08	4.83	2.79	2.29	
17				4.83	6.60	5.84	8.89	4.83	5.33	3.05	2.54	
18				5.08	1.78	5.08	8.38	3.56	4.06	0.51	2.54	
19				5.84	1.02	7.62	6.10	3.81	6.35	0.76	2.29	
20				5.84	1.27	8.64	7.11	7.37	7.37	3.05	3.05	
21				3.05	3.05	8.38	7.62	8.38	2.79	3.05	2.54	
22				2.79	5.59	4.83	8.64	8.38	2.54	3.30	2.79	
23				2.29	6.86	4.83	9.40	7.62	4.57	3.56	2.29	
24				4.32	6.86	7.11	8.38	7.62	6.35	4.32	2.03	
25				6.86	8.38	5.33	8.13	7.11	6.35	2.29	2.03	
26				6.60	7.62	6.35	5.08	8.13	6.35	2.54	2.29	
27				7.62		7.37	5.08	8.38	6.35	2.79	2.54	
28				7.62		7.87	3.56	8.38	4.06	1.52	1.52	
29				6.86		7.62	5.59	8.64	1.27	0.51	1.52	
30				4.32		6.86	3.81	7.62	4.32	1.02	1.27	
31							2.03	7.11		3.05		
Total				92.71	141.48	198.63	205.49	201.42	176.28	83.57	77.22	
ave.=				5.15	5.44	6.62	6.63	6.95	5.88	2.70	2.57	

Kalam

Evaporation in mm/day 1988

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					5.08	7.62	7.11	6.60	5.84	3.81	3.56	
2					2.29	7.62	6.35	6.35	6.10	2.54	4.06	
3					5.08	6.86	8.64	5.84	3.05	2.54	2.54	
4					6.35	7.37	8.89	5.84	4.32	3.30	3.56	
5					6.86	5.33	8.64	5.59	3.05	3.05	3.05	
6					8.38	5.08	8.13	7.11	6.35	5.08	3.81	
7				2.54	8.13	5.59	9.14	8.13	7.37	5.59	3.81	
8				1.52	6.86	3.81	7.62	8.64	7.11	2.54	3.30	
9				1.52	5.33	2.03	8.89	7.37	6.10	1.52	3.30	
10				3.81	8.13	5.08	10.67	6.60	2.54	2.54	3.56	
11				3.05	8.13	5.08	6.86	6.35	6.10	4.06	3.56	
12				4.32	8.38	6.60	7.87	5.59	5.59	5.08	3.81	
13				5.08	6.60	7.37	8.89	5.59	5.33	2.03	3.30	
14				5.84	7.62	7.11	7.62	7.62	5.08	2.54	3.56	
15				5.84	7.11	5.59	3.81	5.33	7.62	3.56	3.81	
16				5.59	6.60	6.10	2.54	1.52	7.87	3.81	3.56	
17				6.10	7.62	7.11	4.57	3.30	5.84	3.81	3.30	
18				4.83	4.83	8.64	6.86	6.86	1.52	3.30	3.05	
19				0.25	0.25	10.92	6.35	5.08	5.08	4.32	3.81	
20				5.08	20.32	11.43	6.86	5.84	5.08	2.54	3.81	
21				5.33	4.83	8.38	6.35	6.60	5.08	3.05	3.30	
22				6.35	7.37	9.65	6.86	6.86	4.83	4.06	3.05	
23				6.60	6.60	9.65	6.35	3.56	2.79	3.81	3.56	
24				4.57	7.87	8.89	2.54	5.59	5.08	4.06	2.54	
25				6.35	8.38	10.16	5.84	5.84	6.35	3.05	1.78	
26				8.13	7.87	11.43		1.27	4.83	3.56	2.54	
27				8.13	7.62	7.11		0.76	5.08	3.81	2.03	
28				7.62	8.38	6.60	5.84	4.06	5.59	3.81	2.29	
29				7.11	10.16	5.59	7.87	5.59	5.08	3.30	2.54	
30				4.32	8.89	3.81	7.37	5.59	3.81	3.56	1.78	
31					10.16		6.86	5.59		4.57		
Total				119.89	228.09	213.61	202.18	172.47	155.45	108.20	95.50	
ave.=				5.00	7.36	7.12	6.97	5.56	5.18	3.49	3.18	

Kalam

Evaporation in mm/day 1989

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					1.78	9.14	8.89	5.59	2.29	4.32	2.79	
2					0.51	10.92	4.83	5.08	5.84	4.06	1.02	
3					0.76	10.41	6.60	5.08	6.10	4.06	1.78	
4					3.56	9.65	3.05	5.84	6.60	4.32	3.56	
5				3.05	4.06	2.29	2.79	3.56	6.35	5.08	3.30	
6				4.06	2.54	11.18	1.02	0.76	6.86	5.08	3.05	
7				4.06		9.91		6.10	6.60	3.56	3.56	
8				3.05	4.57	7.62	9.14	6.10	6.86	5.81	3.30	
9				0.51	2.54	3.81	8.89	3.81	5.08	6.60	3.05	
10				3.05	3.05	2.03	9.65	6.60	5.84	5.08	1.02	
11				5.08	2.54	1.78	10.16	7.62	7.11	5.59	0.25	
12				5.08	4.32	7.62	10.41	7.62	6.86	3.81	0.51	
13				15.24	5.08	7.62	9.91	7.62	6.60	3.05	2.54	
14				5.59	7.62	8.13		4.06	6.60	0.51	2.29	
15				5.59	7.11	8.13		5.33	7.11	1.02	3.05	
16				6.10	7.62	8.13	23.37	5.08	6.35	3.30		
17				4.32	6.35	8.13	9.40	7.11	6.60	4.57		
18				4.57	6.60	8.38	6.35	6.35	6.60	5.33	1.52	
19				5.08	5.08	8.13	7.62	7.11	5.84	5.08	0.76	
20				5.84	7.62	8.64	6.86	3.81	2.79	4.57	1.52	
21				6.10	8.89	5.08	5.08	5.33	1.27	4.57	1.52	
22				6.10	8.13	5.08	5.08	5.08	3.81	4.32	1.02	
23				5.84	7.62	4.83	5.08	3.56	0.76	5.08	0.25	
24				3.30	2.54	5.08	3.81	3.05	0.25	3.81	1.27	
25				1.52	7.62	8.38	1.27	4.83	4.83	0.25	1.27	
26				4.32	8.89	9.14	5.08	6.86	5.59	2.54	1.02	
27				5.59	10.16	9.91	7.11	2.54	3.81	3.30	2.03	
28				6.35	10.41	8.89	10.67	0.51	4.06	3.05	2.03	
29				5.84	8.64	8.38	8.89	4.06	4.57	3.56	2.54	
30				6.35	9.14	8.89		2.54	4.57	3.30	2.03	
31					9.65		1.27	2.79		3.30		
Total				131.57	175.01	225.30	192.28	151.38	154.43	121.92	53.85	
ave.=				5.06	5.83	7.51	7.12	4.88	5.15	3.93	1.92	

Kalam

Evaporation in mm/day 1990

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					4.83	5.33	9.91	9.65	6.10	3.05		2.03
2					4.06	6.35	8.13	7.11	7.11	2.79		
3					5.59	6.60		6.86	6.35	5.08	2.29	
4					5.84	5.33		5.59	7.11	3.56	2.29	
5					5.08	5.59		6.86	4.57	5.84	2.54	
6					5.84	6.86		3.81	2.54	6.10	2.54	
7					5.84	4.06		7.62	7.11	6.10	2.54	
8					6.10	3.30	7.62	6.60	6.86	7.11	2.54	
9				0.76	7.11	7.11	10.41	4.32	4.57	3.81	2.54	
10				2.54	8.64	3.05	7.37	2.54	6.35	5.08	2.54	
11				1.52	8.13	8.13	8.64	7.62	8.13	5.08	2.54	
12				0.51	9.40	5.08	4.57	7.62	6.60	5.59	2.54	
13				3.81	9.91	6.35	5.59	8.13	6.10		2.54	
14				4.57	10.16	6.10	7.87	7.11	5.08	5.33	2.79	
15					9.65	7.62	7.62	6.86	5.59	6.10	2.29	
16				3.30	9.40	8.38	9.14	7.62	6.35		2.03	
17				6.86	8.13	9.65	5.84	7.87	6.60		2.03	
18				0.51	7.87	10.16	7.62	7.11	8.13		2.03	
19				3.05	9.65	9.65	6.86	8.13	6.35	2.54	1.78	
20				3.81	7.62	10.92	7.62	7.11	2.54	2.54	1.78	
21				2.79	6.86	8.38	6.35	5.33	5.59	20.32	2.03	
22				2.54	8.13	11.68	6.60	5.08	5.59	2.54	2.29	
23				4.06	2.79	11.94	7.62	6.60	6.35	3.56	2.79	
24				5.33	10.16	12.19	8.38	6.35	6.86	2.79	2.54	
25				5.33	10.16	8.89	8.89	6.60	4.06	2.54	2.29	
26				1.78	9.91	6.35	8.13	6.35	4.57	3.05	2.29	
27					10.67	5.08	8.89	8.13	5.08	2.54	2.79	
28					8.64	6.10	8.38	19.30	4.06	2.79	2.79	
29					2.54	8.89	5.08	8.89	5.08	2.79	3.05	
30				4.83	1.02	8.38	8.13	6.10	4.83		3.05	
31					7.62		9.40	5.59				
Total				57.91	227.33	223.52	200.66	220.47	172.21	118.62	68.07	2.03
ave.=				3.22	7.33	7.45	7.72	7.11	5.74	4.74	2.43	2.03

Kalam

Evaporation in mm/day 1991

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Total												
ave.=												

Kalam

Evaporation in mm/day 1992

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					2.03	7.62	5.08	7.62	7.62	2.03	2.54	1.52
2					3.30	4.32	5.08	6.60	5.84	1.02	2.54	1.27
3					2.54	6.35	5.33	6.35	2.03	1.52	3.05	
4					3.81	6.86	5.84	7.11	2.03	4.32	2.54	
5					1.27	8.89	7.62	0.51	5.08	4.06	2.29	
6					4.32	6.35	10.16	6.60	4.83	2.54	0.51	
7					2.03	7.62	11.43	5.08	2.79	2.54	1.78	
8					5.59	5.33	10.41	6.35	3.56	3.56	1.78	
9					2.54	5.08	9.91	2.29	2.54	2.29	2.03	
10					3.81	6.35	8.38	1.78	0.76	0.76	2.54	
11					5.59	4.83	10.16	3.81	2.03	3.56	2.03	
12					6.35		8.89	5.08	1.52	3.05	2.54	
13					4.06		6.35	5.59	5.08	3.56	2.79	
14					4.57		2.54	7.62	5.08	3.81	2.79	
15					1.27	24.64	2.03	7.62	5.33	4.06	2.54	
16					3.05	5.08	7.62	5.33	4.32	3.56	2.79	
17					1.02	7.62	7.62	3.05	6.35	4.06	2.03	
18					2.03	6.35	6.86	2.54	5.08	2.03	1.78	
19				3.81	6.35	7.62	7.62	4.32	4.57	1.02	0.51	
20				0.76	6.10	7.87	7.11	5.08	3.30	2.03	0.25	
21				0.25	4.57	8.89	6.35	3.56	4.57	2.03	0.76	
22				0.25	5.59	3.30	7.87	4.57	5.08	2.29	1.27	
23				4.06	8.13	5.08	7.62	4.32	5.08	2.29	2.03	
24				5.08	5.84	7.37	7.62	5.08	5.33	2.54	1.78	
25				5.08	8.38	8.13	5.08	4.32	5.08	2.79	2.29	
26				5.08	8.13	7.62	4.57	7.11	5.08	2.79	2.54	
27				3.30	5.08	7.62	6.35	8.13	5.59	2.54	2.54	
28				5.08	2.79	7.37	6.60	7.62	5.08	2.79	2.54	
29				3.30	2.54	6.86	7.62	1.52	5.08	2.79	2.03	
30				3.30	6.35	5.08	5.33	5.84	4.57	2.54	2.03	
31					5.08		6.35	6.60		2.54		
Total				39.37	134.11	196.09	217.42	159.00	130.30	83.31	61.47	2.79
ave.=				3.28	4.33	7.26	7.01	5.13	4.34	2.69	2.05	1.40

Kalam

Evaporation in mm/day 1993

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					2.54	3.56	8.89	7.62	6.60	6.35	3.05	
2					6.35		9.14	3.81	6.86	6.10	3.05	
3					6.86		9.65	2.29	3.56	5.84	3.56	
4					6.86		9.14	2.54	3.81	6.35	3.05	
5					6.35	15.75	9.40	4.57	6.35	3.30	1.02	
6					5.84	12.70	8.13	5.08	6.10	1.52	0.76	
7					6.10	7.62	9.91	6.10	6.10	1.02	1.78	
8					5.84	7.62	7.62	3.56	3.05	0.51		
9					3.30	8.89	5.08	6.35	4.83	0.51		
10					3.56	8.13	5.84	5.08	3.30	2.03		
11					2.79	13.72	3.30	4.32	3.81	2.54		
12					4.57	8.89	7.37	3.05	4.57	3.05		
13					6.86	8.13	8.64	4.83	3.81	3.30		
14					6.60	8.89	9.65	6.10	4.06	3.56		
15					6.35	7.11	5.08	5.59	4.57	4.32		
16					4.06	6.35	8.13	5.08	5.33	4.06		
17					4.57	6.86	4.32	6.35	4.32	3.81		
18				5.08	4.06	6.35	7.87	5.33	4.57	3.05		
19				5.59	5.84	8.64	6.35	4.06	5.59	3.81		
20				6.35	6.10	8.64	8.13	5.08	5.08	4.06		
21				7.62	7.62	9.14	7.62	3.81	7.62	4.57		
22				6.35	8.13	10.16	7.87	3.81	6.35	5.08		
23				5.08	7.62	10.41	2.03	4.57	4.06	3.81		
24				6.35	7.11	2.54	3.30	6.60	3.56	2.79		
25				6.35	8.89	4.06	1.27	3.05	4.06	3.81		
26				8.89	7.62	4.32	4.57	6.35	2.54	3.56		
27				7.62	7.62	4.06	5.08	6.35	5.08	3.81		
28				4.06	8.89	5.33	5.08	6.10	5.08	3.05		
29				5.33	6.10	6.35	7.62	6.60	5.59	3.30		
30				7.11	7.11	8.64	5.59	6.60	6.10	3.30		
31					5.08		7.62	7.62		2.54		
Total				81.79	187.20	212.85	209.30	158.24	146.30	108.71	16.26	
ave.=				6.29	6.04	7.88	6.75	5.10	4.88	3.51	2.32	

Kalam

Evaporation in mm/day 1994

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					0.76	5.08	9.14	7.62	4.32	4.83	3.81	2.03
2					3.81	6.35	8.89	7.62	6.35	5.08	3.30	1.78
3					1.27	6.35	7.62	7.62	7.11	4.83	0.25	2.54
4					5.08	5.33	1.27	7.87	5.59	4.06	2.29	2.03
5					5.33	7.62	7.62	7.62	1.52	1.27	3.05	2.03
6					7.37	8.89	7.62	5.59	1.27	0.76	2.54	
7					4.57	10.16	8.38	8.13	4.32	2.54	3.05	
8					3.81	6.60	8.89	7.62	0.51	2.79	2.54	
9					2.29	4.83	8.38	7.11	5.08	3.05	3.05	
10					1.52	2.29	8.89	8.38	5.84	3.30	2.54	
11					4.57	5.84	9.40	14.22	6.35	1.78	2.54	
12					5.08	4.06	6.35	5.59	3.56	0.76	8.89	
13					2.54	2.54	2.54	7.62	6.35	2.54	1.78	
14					4.06	3.05	2.54	6.35	6.10	3.05	2.29	
15					4.57	3.81	5.33	6.60	6.60	3.30	2.54	
16					5.84	3.81	8.13	8.13	4.57	3.05	2.03	
17					6.35	5.08	7.62	5.08	4.32	3.56	2.54	
18					6.86	6.86	8.64	5.84	2.03	2.54	2.03	
19				3.81	8.38	7.62	7.87	6.35	4.57	3.05	2.29	
20				4.32	5.59	8.13	8.38	7.11	5.59	3.30	2.54	
21				4.32	6.35	8.38	8.13	7.62	3.81	3.30	1.78	
22				5.08		8.89	8.13	8.13	4.32	3.56	2.03	
23				4.57	11.18	6.35	7.87	7.87	2.29	3.81	1.78	
24				6.10	4.83	8.38	7.62	7.37	3.05	3.81	1.78	
25				6.35	5.59	8.89	3.30	5.08	5.33	1.78	2.54	
26				6.86	6.10	7.87	8.13	6.35	3.81	1.02	1.78	
27				6.86	5.33	8.89	7.62	5.33	5.08	1.52	3.81	
28				6.60	6.35	8.89	8.13	6.10	5.08	3.05	1.52	
29				7.11	6.60	10.16	8.13	6.60	5.33	3.56	2.29	
30				4.06	6.35	8.38	7.62	7.62	5.59	4.06	2.03	
31					4.57		8.89	5.84		3.81		
Total				66.04	152.91	199.39	227.08	222.00	135.64	92.71	77.22	10.41
ave.=				5.50	5.10	6.65	7.33	7.16	4.52	2.99	2.57	2.08

Kalam

Evaporation in mm/day 1995

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1						0.51	8.38	7.62	2.54	5.08	3.05	
2					5.08	0.76	9.65	7.87	3 56	3.81	3 56	
3						1 27	10.16	6.60	3.81	3.56	3.81	
4					5.59	6.60	10.67	7.11	3.30	3.56	4.06	
5						7.62	9.65	9.14	5.08	4 06	4.06	
6				5.08	7.11	8.13	10.92	3 56	3.56	4.57	3.81	
7				5.59	7.62	8.89	9.40	4.57	6 35	6 35	2 54	
8				2.79	7.11	8.89	9.14	4.83	7.11	5.08	2.54	
9				0.51	7.37	7.62	10.67	6.10	6.35	4.83	2.29	
10				2.54		7.62	9.14	7.11	3.30	3.30	2.79	
11				2.03		8.89	7.62	6.35	6.35	1.27	2 54	
12				0.51		8.38	7.62	6.60	6.60	3.81	2.54	
13				3.30	20.32	9.40	7.87	6.60	5.08	4.06	2.29	
14				5.59		9.65	7.62	7.62	5.08	1.78	3.05	
15				5.08	8.38	10.16	7.87	7.87	5.59	0.76	3.30	
16				1.52		10.16	8.13	7.87	4.57	1.02	2.79	
17				3.30	6.10	9.14	7.11	6.35	6.35	1.78	2.54	
18				1.78		9.14	7.62	1.78	5.59	3.05	3.56	
19				1.02	6.86	8.64	6.60	4.32	6.35	2.79	3.81	
20				2.54	3.05	5.33	4.57	6.10	5.08	2.03	2.54	
21				3.81	1.27	4.06	5.59	7.62	5.84	0.76	2.03	
22				4.32	1.02	1.27	6.86	6.60	6.10	1.27	1.78	
23				1.27	4.06	4.06	7.11	5 59	5.08	2.54	1.78	
24				3.56	1.78	6.86	6.35	5.84	6.35	2.79	2.03	
25				3.81	1.52	8.89	1.52	6.10	6.60	2.54	1.52	
26				2.29	0.76	3.30	3 30	6.35	6.60	1.78	1.52	
27				2.54	3.81	7.11	4.57	5.08	4.32	2.54		
28				5.33	5 33	8.13	6.35	6.35	5.08	2.79		
29				5.59	7.62	8.38	7.62	6.35	1.27	3.05		
30				1.27	7.11	8.64	6.86	6.35	2.03	2.03		
31					4.57		6.60	5.33		2.54		
Total				76.96	123.44	207.52	233.17	193.55	150.88	91.19	72.14	
ave.=				3.08	5.61	6.92	7.52	6 24	5.03	2 94	2.77	

Kalam

Evaporation in mm/day 1996

Date	Jan	Feb	Mar	April	May	Jun	July	Aug	Sep	Oct	Nov	Dec
1					4.32	6.10	3.81	7.11	5.59	6.10	2.79	1.78
2					2.79	7.37	5.33	2.54	6.60	4.57	2.54	1.52
3					0.76	7.62	5.59	3.56	2.79	1.27	3.05	
4				1.78	0.25	8 89	7.62	3.56	3.30	1.27	3.30	
5				0.51	0 25	8.89	8.13	5.08	5.33	1.78	2.54	
6				0.25	3.56	8.89	7.87	4.57	6.35	1.52	2.54	
7				0.25	5.59	9.91	7.37	5.08	5.84	3.56	2.54	
8				1.02	5.08	8.89	7.62	4.32	6.60	3.05	2.54	
9				2.54	3.81	7.62	7.62	4.83	6.35	2.79	2.54	
10				4.32	4.32	8.13	8.13	3.81	6.35	3.30	2.54	
11				1.78	4.06	8.38	7.62	7.11	6.10	3.81	2.54	
12				0.76	3.56	8.38	7.62	6.86	1.52	4.06	2.54	
13				4.06	5.08	3.81	7.62	7.37	5.59	3.56	3.05	
14				5.08	5.59	3.30	3.81	8.13	5.59	3.81	2.54	
15				5.33	2.54	4.32	3.30	6.10	6.10	3.30	1.78	
16				5.08	3.81	6.35	0.76	6.86	6.35	3.81	2.03	
17				5.08	3.05	3.56	4.06	6.60	5.08	3.30	2.03	
18				5.33	5.33	2.79	5.08	7.62	6.35	1.52	2.54	
19				1.27	5.84	3.30	12.70	4.32	5.08	4.06	0.51	
20				5.08	6.35	5 08	7.62	5.08	5.08	0.51	0.76	
21				4.32	1.78	7.62	5.59	3 81	6.10	1.78	1.27	
22				1.78	2.03	7.62	4.32	6.60	4.83	2.79	1.27	
23				3.56	2.03	8.89	9.14	3.81	3.05	3.05	1.52	
24				5.59	1.27	8 89	9.65	6.35	5.59	3.05	1.78	
25				5.08	0.76	8.89	7.62	5.59	5.84	3.56	1.76	
26				5.08	6.35	5.08	8.38	5.84	5.84	3.56	1.78	
27				11.43	5.59	5.08	8.13	6.86	6.10	3.30	1.52	
28					6.35	6.35	8.89	6.10	5.84	3.81	1.27	
29					6.10	5.84	7.62	5.33	6.35	3.30	1.52	
30					5.33	2.54	8.38	5.33	5.84	3.30	1.27	
31					8.13		8.89	5.59		3.30		
Total				86.36	121 67	198.37	215.90	171.70	163.32	95.76	62.23	3.30
ave.=				3.60	3.92	6.61	6.96	5.54	5.44	3.09	2.07	1.65