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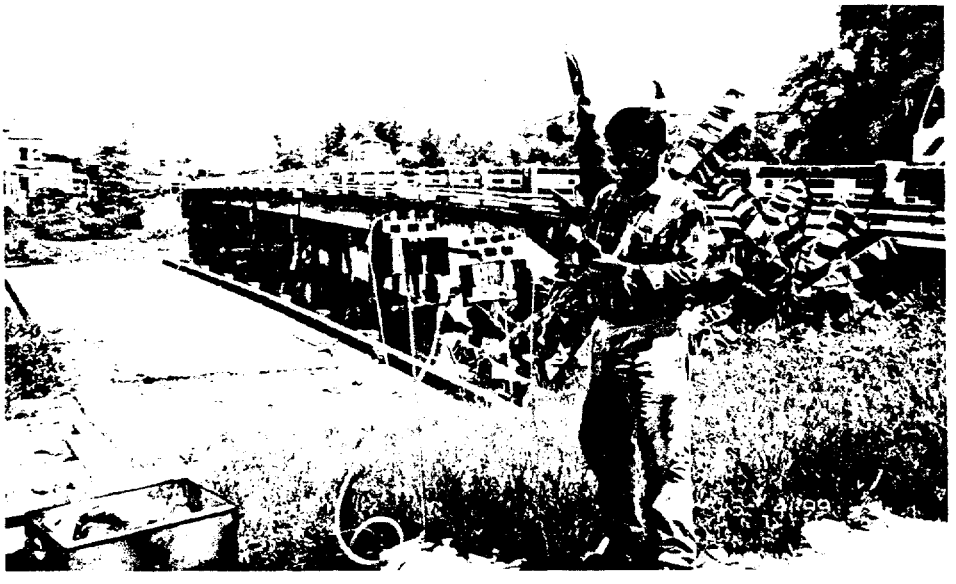
THE THIRD HIGHWAY REHABILITATION PROJECT (HRP3)



ENVIRONMENTAL IMPACT ASSESSMENT

MAY 1999

Volume two: APPENDICES

Implementing Agency:
ENVIRONMENTAL PROTECTION CENTRE
(EPC, Vietnam)

ASIA PACIFIC ENGINEERING CONSULTANTS (APECO)

In association with

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ABBREVIATION

AAS	Actual Acid Sulphate Soil
ADB	Asian Development Bank
ASS	Acid Sulphate Soil
BOD	Biochemical Oxygen Demand
CEC	Carbon Exchange Capacity
COD	Chemical Oxygen Demand
dBA	Decibelt A
DO	Dissolved Oxygen
DOSTE	Department of Science, Technology and Environment
DRC	District Resettlement Committee
DWT	Dead Weight Tonnage
EAP	Environmental Action Plan
EIA	Environmental Impact Assessement
EMP	Environmental Management Plan
EPC	Environmental Protection Center
ESCAP	Economic Social Committee of Asia and Pacific
GDP	Gross Domestic Production
GIS	Geographic Information System
HRP	Highway Rehabilitation Project
ITF	Interim Trust Fund
MOF	Ministry of Finance
MOSTE	Ministry of Science, Technology and Environment
MOT	Ministry of Transport
MSL	Mean Sea Level
NEA	National Environmental Agency
NEMR	Northeast Mekong Region
NEMS	National Environmental Monitoring System
NE	North East
NH	National Highway
NW	North West

PAP	Project Affected Persons
PASS	Potential Acid Sulphate Soil
PMU	Project Management Unit
PPC	Provincial Resettlement Committee
RRAP	Resettlement and Rehabilitation Action Plan
PRC	Provincial Resettlement Committee
SS	Suspended Solids
SW	South West
TSP	Total Suspended Particles
USA	United States of America
USD	United State Dollar
VND	Vietnam Dongs
VOC	Volatile Organic Matter
WB	World Bank
WHO	World Health Organisation

LIST OF APPENDICES

Appendix 3.1. Air quality monitoring at the Section 1

ỦY BAN NHÂN DÂN THÀNH PHỐ HỒ CHÍ MINH
Viện Kỹ Thuật Nhiệt Đới và Bảo Vệ Môi Trường
Trung Tâm Bảo Vệ Môi Trường

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc
-------o☆o-------

KẾT QUẢ PHÂN TÍCH MẪU KHÍ

-------⊕O⊕-------

Nơi yêu cầu: Phòng Quản lý các dự án - Dự án Quốc lộ 1A
Địa điểm thu mẫu: Quãng Ngãi - Đông Hà
Thời gian thu mẫu: từ 13 - 15/4/1999.

Bảng kết quả đo các yếu tố vi khí hậu

STT	Ký hiệu mẫu	Ngày đo	Nhiệt độ (^{0}C)	Độ ẩm (%)	Tốc độ gió (m/s)
1	K_1	13/4/99	30,7	70	0,0 - 0,3
2	K_2	13/4/99	33,2	60	0,0 - 1,4
3	K_3	13/4/99	35,8	62	1,0 - 1,8
4	K_4	13/4/99	33,6	66	0,5 - 1,8
5	K_5	13/4/99	33,0	67	0,0 - 0,3
6	K_6	15/4/99	32,0	63	0,8 - 2,4
7	K_7	15/4/99	33,4	68	0,4 - 1,4
8	K_8	15/4/99	32,6	64	0,0 - 1,5
9	K_9	15/4/99	32,1	66	0,0 - 0,9
10	K_{10}	16/4/99	29,7	74	0,0 - 0,5
11	K_{11}	16/4/99	30,8	70	0,0 - 1,1
12	K_{12}	16/4/99	32	69	0.0 - 2,1
13	K_{13}	16/4/99	32,1	67	0,7 - 2,6

Appendix 3.1 (Cont.) Concentration of pollutants in the air at the Section 1

Bảng kết quả đo nồng độ các chất ô nhiễm trong không khí

STT	Ký hiệu mẫu	Nồng độ chất ô nhiễm (mg/m^3)				
		Bụi	SO_2	NO_2	CO	Pb
1	K_1	0,43	0,098	0,047	6,2	$3,5 \times 10^{-4}$
2	K_2	1,03	0,127	0,063	9,8	$5,2 \times 10^{-4}$
3	K_3	0,37	0,075	0,037	3,7	$1,7 \times 10^{-4}$
4	K_4	0,40	0,087	0,040	3,2	$2,2 \times 10^{-4}$
5	K_5	0,41	0,091	0,042	4,8	$2,5 \times 10^{-4}$
6	K_6	0,54	0,085	0,041	4,0	$2,7 \times 10^{-4}$
7	K_7	0,38	0,071	0,035	2,9	$1,3 \times 10^{-4}$
8	K_8	0,39	0,068	0,029	1,1	$<0,1 \times 10^{-4}$
9	K_9	0,37	0,087	0,038	5,4	$2,5 \times 10^{-4}$
10	K_{10}	0,40	0,080	0,036	4,3	$2,5 \times 10^{-4}$
11	K_{11}	0,40	0,073	0,033	2,6	$1,5 \times 10^{-4}$
12	K_{12}	0,35	0,058	0,025	1,5	$<0,1 \times 10^{-4}$
13	K_{13}	0,45	0,083	0,042	4,6	$3,0 \times 10^{-4}$

Appendix 3.1 (Cont.) Noise level at the Section 1

Bảng kết quả đo độ ồn (mức âm tương đương liên tục theo đặc tính A)

STT	Ký hiệu mẫu	Ngày đo	LEQ (dBA)	LMAX (dBA)	LMIN (dBA)	LPK (dBA)
1	K_1	13/4/99	75,7	93,7	58,0	111,9
2	K_2	13/4/99	74,1	92,5	60,4	113,4
3	K_3	13/4/99	68,5	89,8	56,1	104,7
4	K_4	13/4/99	73,8	91,5	58,5	107,0
5	K_5	13/4/99	74,3	91,8	54,8	106,3
6	K_6	15/4/99	75,2	95,9	60,6	113,2
7	K_7	15/4/99	69,6	82,7	60,2	111,4
8	K_8	15/4/99	74,5	94,6	60,4	110,0
9	K_9	15/4/99	66,9	74,6	61,3	90,0
10	K_{10}	16/4/99	76,9	97,1	57,6	118,3
11	K_{11}	16/4/99	66,8	84,2	60,8	104,3
12	K_{12}	16/4/99	65,2	83,4	56,6	106,2
13	K_{13}	16/4/99	67,1	79,7	57,6	95,0

(Có các bảng diễn biến ồn tích phân kèm theo cho từng vị trí)

Appendix 3.1 (Cont.) Traffic density in the Section 1

Bảng kết quả xác định lưu lượng xe

STT	Ký hiệu mẫu	Thời gian	Lưu lượng xe (chiếc/giờ)	
			Ô tô	Xe máy
1	K_1	08:00-09:00	372	618
2	K_2	10:00-11:00	420	600
3	K_3	11:30-12:30	150	240
4	K_4	13:30-14:30	174	402
5	K_5	15:00-16:00	192	390
6	K_6	10:00-11:00	310	390
7	K_7	13:00-14:00	215	350
8	K_8	14:30-15:30	198	184
9	K_9	16:00-17:00	228	660
10	K_{10}	08:00-09:00	228	510
11	K_{11}	09:30-10:30	132	144
12	K_{12}	11:00-12:00	114	54
13	K_{13}	13:00-14:00	126	228

Location of sampling:

Các vị trí thu mẫu:

K_1 - Cầu Đỏ, thành phố Đà nẵng.
K_2 - Cầu Vĩnh Điện (km 984+384), huyện Điện Bàn, tỉnh Quảng Nam.
K_3 - Cầu Tam Kỳ (km 996 + 227), thị xã Tam kỳ, tỉnh Quảng Nam.
K_4 - Cầu Châu Ổ (km 1036 + 98), huyện Bình Sơn , Quảng Ngãi.
K_5 - Cầu Trà Khúc , Thị xã Quảng Ngải.
K_6 - Cầu Đông Hà, thị xã Đông Hà, tỉnh Quảng Trị.
K_7 - Cầu Quảng Trị, thị xã Quảng Trị.
K_8 - Cầu Mỹ Chánh, huyện Mỹ Chánh, tỉnh Quảng Trị .
K_9 - Cầu Phú Xuân, thành phố Huế.
K_{10} - Cầu Vực (km 834 + 433), huyện Phú Lộc, Thừa Thiên - Huế.
K_{11} - Cầu Truồi (km 852 + 336), huyện Phú Lộc, Thừa Thiên - Huế.
K_{12} - Cầu Lăng Cô, Thừa Thiên - Huế.
K_{13} - Cầu Nam Ô, quận Liên Chiểu, thành phố Đà Nẵng.

Ngày 25 tháng 4 năm1999
K/T-*Phòng Giám Sát & Khống Chế*
Ô Nhiễm Không Khí

Nguyễn Thành Vinh

Appendix 3.2. Noise measurement at the Section 1, at Do bridge, Danang City

easuring Parameters:					
ange	50-110dB	Weighting	A	Time Constant	SLOW
hreshold	OFF	Exchange Rate	3dB	Peak Weighting	A
ession Started		Session Stopped		Run Time	
3-APR-99 @ 09:29:11		13-APR-99 @ 09:36:43		0:07:32	
eak Level	111.9dB	13-APR-99 @ 09:32:57			
ax Level	93.7dB	13-APR-99 @ 09:32:56			
in Level	58.0dB	13-APR-99 @ 09:31:10			
verload	0.00%				

EQ	75.7dB	SEL(3)	102.3dB	TWA	57.7dB	TAKM3	79.1dB
DN	75.7dB	CNEL	75.7dB	Pa2Sec	6.8		
5	79.8dB	L10	76.9dB	L50	69.1dB	L90	62.3dB

OGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
tudy 1					
09:29:26	68.6dB	71.1dB	90.7dB	70.6dB	65.2dB
09:29:41	80.9dB	89.2dB	103.9dB	85.4dB	68.4dB
09:29:56	71.8dB	74.8dB	91.5dB	74.4dB	64.0dB
09:30:11	70.2dB	76.3dB	94.5dB	74.8dB	63.3dB
09:30:26	72.8dB	77.8dB	90.5dB	75.2dB	68.2dB
09:30:41	72.6dB	75.9dB	94.6dB	74.9dB	66.3dB
09:30:56	68.6dB	72.7dB	91.6dB	71.6dB	62.5dB
09:31:11	63.0dB	65.8dB	79.7dB	65.0dB	58.4dB
09:31:26	62.7dB	70.5dB	83.9dB	66.0dB	58.7dB
09:31:41	76.8dB	81.6dB	97.5dB	79.4dB	69.0dB
09:31:56	67.3dB	70.8dB	86.8dB	69.9dB	62.6dB
09:32:11	71.4dB	76.1dB	95.6dB	75.0dB	63.3dB
09:32:26	75.6dB	81.2dB	97.1dB	79.0dB	70.8dB
09:32:41	71.3dB	74.5dB	88.8dB	73.6dB	68.3dB
09:32:56	84.9dB	93.4dB	106.1dB	91.2dB	67.0dB
09:33:11	85.0dB	93.7dB	111.9dB	89.5dB	76.1dB
09:33:26	73.8dB	81.8dB	87.5dB	77.7dB	69.2dB
09:33:41	68.8dB	73.2dB	86.0dB	72.3dB	60.6dB
09:33:56	66.9dB	70.3dB	84.6dB	69.5dB	61.0dB
09:34:11	68.3dB	71.8dB	89.7dB	69.3dB	67.3dB
09:34:26	73.3dB	79.4dB	95.7dB	78.3dB	59.4dB
09:34:41	67.1dB	72.2dB	88.0dB	71.4dB	58.4dB
09:34:56	69.8dB	76.2dB	89.5dB	73.9dB	62.7dB
09:35:11	72.1dB	76.8dB	90.8dB	76.0dB	64.1dB
09:35:26	67.8dB	70.1dB	85.6dB	69.7dB	63.3dB
09:35:41	66.8dB	70.0dB	85.1dB	68.8dB	64.4dB
09:35:56	75.9dB	81.4dB	95.5dB	79.4dB	70.4dB
09:36:11	68.5dB	74.6dB	92.8dB	73.4dB	62.3dB
09:36:26	70.5dB	78.3dB	94.7dB	75.2dB	62.7dB
09:36:41	69.0dB	74.5dB	86.5dB	73.5dB	61.4dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Vinhdien bridge (km 981+384), Quangnam province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLO
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	

Session Started	Session Stopped	Run Time
13-APR-99 @ 10:28:38	13-APR-99 @ 10:36:11	0:07:32
Peak Level 113.4dB	13-APR-99 @ 10:35:51	
Max Level 92.5dB	13-APR-99 @ 10:35:51	
Min Level 60.4dB	13-APR-99 @ 10:34:18	
Overload 0.00%		

LEQ	74.1dB	SEL(3)	100.7dB	TWA	56.1dB	TAKM3	77.9dB
LDN	74.1dB	CNEL	74.1dB	Pa2Sec	4.7		
L5	80.3dB	L10	76.8dB	L50	67.7dB	L90	62.6dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 2					
10:28:53	78.4dB	85.3dB	100.7dB	83.2dB	68.0dB
10:29:08	69.7dB	72.1dB	86.4dB	71.7dB	64.6dB
10:29:23	66.0dB	72.1dB	86.4dB	68.9dB	63.3dB
10:29:38	70.6dB	75.6dB	90.3dB	73.9dB	66.5dB
10:29:53	68.8dB	73.3dB	86.0dB	72.4dB	64.3dB
10:30:08	67.0dB	72.7dB	90.2dB	68.4dB	64.7dB
10:30:23	70.1dB	74.8dB	90.7dB	73.5dB	67.1dB
10:30:38	72.5dB	79.0dB	94.8dB	76.9dB	65.7dB
10:30:53	74.5dB	80.8dB	99.4dB	78.4dB	68.1dB
10:31:08	70.1dB	77.4dB	91.5dB	75.8dB	62.1dB
10:31:23	66.2dB	68.5dB	84.4dB	68.1dB	63.6dB
10:31:38	64.1dB	69.9dB	88.1dB	65.2dB	62.0dB
10:31:53	74.4dB	83.9dB	99.0dB	78.9dB	67.7dB
10:32:08	67.8dB	84.3dB	97.8dB	67.1dB	62.2dB
10:32:23	74.4dB	84.7dB	93.5dB	79.1dB	61.5dB
10:32:38	65.7dB	68.1dB	87.5dB	67.5dB	61.3dB
10:32:53	74.3dB	81.8dB	97.9dB	79.8dB	63.7dB
10:33:08	72.7dB	78.5dB	90.7dB	76.3dB	66.5dB
10:33:23	66.5dB	69.3dB	86.2dB	68.2dB	64.3dB
10:33:38	69.2dB	72.3dB	88.5dB	71.9dB	65.7dB
10:33:53	71.0dB	78.9dB	92.0dB	75.6dB	64.1dB
10:34:08	68.2dB	74.1dB	89.4dB	73.0dB	61.0dB
10:34:23	62.8dB	67.3dB	85.0dB	64.5dB	61.2dB
10:34:38	64.7dB	69.1dB	93.1dB	67.5dB	61.3dB
10:34:53	66.8dB	74.3dB	89.7dB	71.5dB	61.7dB
10:35:08	81.3dB	88.0dB	101.2dB	85.8dB	70.4dB
10:35:23	78.2dB	86.1dB	98.6dB	84.4dB	64.8dB
10:35:38	69.7dB	74.2dB	89.0dB	72.3dB	62.7dB
10:35:53	83.1dB	92.5dB	113.4dB	88.6dB	73.5dB
10:36:08	75.1dB	81.6dB	97.8dB	78.3dB	67.9dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Tamky bridge (km 981+384), Quangnam province

leasuring Parameters:							
ange	50-110dB	Weighting	A	Time Constant	SLOW		
hreshold	OFF	Exchange Rate	3dB	Peak Weighting	A		
ession Started		Session Stopped		Run Time			
3-APR-99 @ 12:59:09		13-APR-99 @ 13:06:41		0:07:32			
eak Level	104.7dB	13-APR-99 @ 13:02:31					
ax Level	89.8dB	13-APR-99 @ 13:02:30					
in Level	56.1dB	13-APR-99 @ 12:59:10					
verload	0.00%						
EQ	68.5dB	SEL(3)	95.0dB	TWA	50.5dB	TAKM3	71.4dB
DN	68.5dB	CNEL	68.5dB	Pa2Sec	1.2		
5	71.5dB	L10	68.9dB	L50	63.3dB	L90	60.7dB

OGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
tudy 3					
12:59:24	58.4dB	61.0dB	78.9dB	60.6dB	56.5dB
12:59:39	59.9dB	62.1dB	81.8dB	60.9dB	59.0dB
12:59:54	57.2dB	59.3dB	75.8dB	58.7dB	56.4dB
13:00:09	66.2dB	70.7dB	86.7dB	70.1dB	60.9dB
13:00:24	63.8dB	68.8dB	81.2dB	66.4dB	61.4dB
13:00:39	65.6dB	67.8dB	83.0dB	67.4dB	62.5dB
13:00:54	62.1dB	63.3dB	76.8dB	62.9dB	61.4dB
13:01:09	66.1dB	70.4dB	83.8dB	69.5dB	61.7dB
13:01:24	63.7dB	66.3dB	77.6dB	64.7dB	62.8dB
13:01:39	66.5dB	70.2dB	84.7dB	69.8dB	63.2dB
13:01:54	66.3dB	70.1dB	85.1dB	69.2dB	62.8dB
13:02:09	64.4dB	68.2dB	85.5dB	67.3dB	62.1dB
13:02:24	61.6dB	63.6dB	77.3dB	62.5dB	61.0dB
13:02:39	80.4dB	89.8dB	104.7dB	86.1dB	64.6dB
13:02:54	63.0dB	66.2dB	78.4dB	65.4dB	61.0dB
13:03:09	64.6dB	72.0dB	86.0dB	69.0dB	60.7dB
13:03:24	67.2dB	73.7dB	87.2dB	72.4dB	61.9dB
13:03:39	69.9dB	76.0dB	89.9dB	74.4dB	64.5dB
13:03:54	63.1dB	67.2dB	80.8dB	65.5dB	61.3dB
13:04:09	63.6dB	66.4dB	80.4dB	65.4dB	61.3dB
13:04:24	71.1dB	76.8dB	88.4dB	75.9dB	64.6dB
13:04:39	64.7dB	68.4dB	91.2dB	67.0dB	61.8dB
13:04:54	64.4dB	68.9dB	94.3dB	66.9dB	61.1dB
13:05:09	68.6dB	74.1dB	88.2dB	73.3dB	62.0dB
13:05:24	64.9dB	69.3dB	85.8dB	66.4dB	62.6dB
13:05:39	63.3dB	67.1dB	81.7dB	65.8dB	61.0dB
13:05:54	66.6dB	72.9dB	90.5dB	70.1dB	60.7dB
13:06:09	65.1dB	69.3dB	81.2dB	68.9dB	62.2dB
13:06:24	64.5dB	68.9dB	91.7dB	66.2dB	62.9dB
13:06:39	65.2dB	70.9dB	88.0dB	68.3dB	62.3dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Chauo bridge (km 1036+98), Quangngai province

Measuring Parameters:					
Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A
Session Started		Session Stopped		Run Time	
13-APR-99 @ 14:44:27		13-APR-99 @ 14:52:00		0:07:32	
Peak Level	107.0dB	13-APR-99 @ 14:51:07			
Max Level	91.5dB	13-APR-99 @ 14:49:44			
Min Level	58.5dB	13-APR-99 @ 14:50:15			
Overload	0.00%				

LEQ	73.8dB	SEL(3)	100.4dB	TWA	55.8dB	TAKM3	77.3dB
LDN	73.8dB	CNEL	73.8dB	Pa2Sec	4.3		
L5	77.6dB	L10	74.3dB	L50	66.1dB	L90	60.6dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 4					
14:44:42	74.5dB	78.1dB	92.6dB	77.3dB	67.4dB
14:44:57	68.7dB	74.5dB	91.9dB	72.1dB	62.8dB
14:45:12	64.4dB	70.0dB	88.1dB	68.1dB	60.7dB
14:45:27	66.6dB	72.1dB	87.2dB	70.2dB	61.7dB
14:45:42	66.7dB	71.7dB	87.9dB	70.3dB	61.2dB
14:45:57	67.2dB	73.5dB	87.2dB	70.9dB	61.9dB
14:46:12	66.7dB	71.2dB	91.8dB	69.9dB	60.7dB
14:46:27	66.9dB	74.3dB	90.8dB	71.4dB	61.7dB
14:46:42	67.4dB	71.5dB	87.7dB	70.6dB	61.1dB
14:46:57	60.7dB	63.2dB	84.1dB	62.0dB	59.4dB
14:47:12	63.7dB	70.3dB	88.7dB	67.4dB	60.1dB
14:47:27	73.9dB	80.1dB	94.6dB	78.0dB	64.7dB
14:47:42	68.2dB	73.1dB	92.0dB	71.0dB	64.4dB
14:47:57	68.9dB	73.4dB	88.9dB	72.7dB	63.4dB
14:48:12	73.0dB	78.6dB	93.2dB	77.3dB	64.9dB
14:48:27	70.5dB	76.9dB	92.2dB	73.3dB	65.9dB
14:48:42	66.4dB	73.7dB	95.2dB	70.8dB	61.6dB
14:48:57	68.9dB	73.9dB	88.7dB	72.1dB	64.9dB
14:49:12	64.8dB	72.5dB	88.6dB	69.1dB	59.2dB
14:49:27	64.3dB	70.8dB	97.6dB	67.8dB	59.5dB
14:49:42	69.2dB	76.8dB	92.1dB	73.0dB	63.4dB
14:49:57	83.6dB	91.5dB	106.6dB	89.2dB	68.3dB
14:50:12	64.1dB	69.5dB	82.4dB	67.5dB	59.7dB
14:50:27	61.8dB	65.3dB	83.8dB	63.8dB	58.9dB
14:50:42	71.6dB	79.7dB	93.7dB	76.7dB	65.4dB
14:50:57	79.9dB	89.6dB	106.4dB	85.5dB	65.5dB
14:51:12	82.6dB	91.5dB	107.0dB	88.9dB	65.9dB
14:51:27	70.7dB	79.1dB	93.6dB	76.6dB	60.6dB
14:51:42	70.4dB	76.1dB	89.2dB	74.5dB	61.9dB
14:51:57	63.0dB	70.6dB	84.4dB	65.6dB	59.9dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Trakhuc bridge, Quangngai province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
13-APR-99 @ 15:58:25	13-APR-99 @ 16:05:58	0:07:32
Peak Level 106.3dB	13-APR-99 @ 16:02:58	
Max Level 91.8dB	13-APR-99 @ 16:02:58	
Min Level 54.8dB	13-APR-99 @ 15:58:48	
Overload 0.00%		

LEQ	74.3dB	SEL(3)	100.9dB	TWA	56.3dB	TAKM3	77.6dB
LDN	74.3dB	CNEL	74.3dB	Pa2Sec	4.8		
L5	81.1dB	L10	76.5dB	L50	66.1dB	L90	60.5dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 5					
15:58:40	64.7dB	69.1dB	88.7dB	67.8dB	60.7dB
15:58:55	65.3dB	79.3dB	94.0dB	62.9dB	55.2dB
15:59:10	74.1dB	80.5dB	96.8dB	78.5dB	66.8dB
15:59:25	61.1dB	66.8dB	78.6dB	63.0dB	57.6dB
15:59:40	79.1dB	86.5dB	100.9dB	84.3dB	61.2dB
15:59:55	71.3dB	75.5dB	90.0dB	73.7dB	66.9dB
16:00:10	68.5dB	72.6dB	86.1dB	71.9dB	63.1dB
16:00:25	62.7dB	67.3dB	83.2dB	65.7dB	59.4dB
16:00:40	74.1dB	84.1dB	98.0dB	79.7dB	57.9dB
16:00:55	67.1dB	71.9dB	87.5dB	70.2dB	63.5dB
16:01:10	69.2dB	72.1dB	88.5dB	71.4dB	65.0dB
16:01:25	76.7dB	84.6dB	97.2dB	82.7dB	65.3dB
16:01:40	66.6dB	70.2dB	86.6dB	69.2dB	63.0dB
16:01:55	64.1dB	66.7dB	82.8dB	66.1dB	60.9dB
16:02:10	76.3dB	85.1dB	99.5dB	80.8dB	66.7dB
16:02:25	64.8dB	68.4dB	86.8dB	67.2dB	61.2dB
16:02:40	65.9dB	69.8dB	83.6dB	68.7dB	62.1dB
16:02:55	67.7dB	74.2dB	90.8dB	70.7dB	60.7dB
16:03:10	83.3dB	91.8dB	106.3dB	88.9dB	64.6dB
16:03:25	64.3dB	66.8dB	81.9dB	66.1dB	60.1dB
16:03:40	60.5dB	64.7dB	82.3dB	63.0dB	58.0dB
16:03:55	67.0dB	75.0dB	96.2dB	71.7dB	61.5dB
16:04:10	71.3dB	79.7dB	93.8dB	75.8dB	64.9dB
16:04:25	68.0dB	74.1dB	89.1dB	71.7dB	63.4dB
16:04:40	67.4dB	73.2dB	84.8dB	70.0dB	62.7dB
16:04:55	72.5dB	83.1dB	103.0dB	73.6dB	62.4dB
16:05:10	82.1dB	87.8dB	105.9dB	86.7dB	69.2dB
16:05:25	68.4dB	70.6dB	87.4dB	70.2dB	65.4dB
16:05:40	71.9dB	79.9dB	100.5dB	77.0dB	64.6dB
16:05:55	78.5dB	87.5dB	105.7dB	82.8dB	68.4dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1, At Dongha bridge, Quangtri province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
15-APR-99 @ 10:49:47	15-APR-99 @ 10:57:19	0:07:32
Peak Level 113.2dB	15-APR-99 @ 10:50:50	
Max Level 95.9dB	15-APR-99 @ 10:50:49	
Min Level 60.6dB	15-APR-99 @ 10:52:23	
Overload 0.00%		

LEQ	75.2dB	SEL(3)	101.8dB	TWA	57.2dB	TAKM3	79.5dB
LDN	75.2dB	CNEL	75.2dB	Pa2Sec	6.0		
L5	79.9dB	L10	76.9dB	L50	68.0dB	L90	62.5dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 6					
10:50:02	71.8dB	77.8dB	93.5dB	75.6dB	68.8dB
10:50:17	74.7dB	78.6dB	92.6dB	77.4dB	69.4dB
10:50:32	70.0dB	75.0dB	92.4dB	73.7dB	63.6dB
10:50:47	68.8dB	74.3dB	88.4dB	72.3dB	64.3dB
10:51:02	86.4dB	95.9dB	113.2dB	91.4dB	67.7dB
10:51:17	71.2dB	75.7dB	91.5dB	75.2dB	63.9dB
10:51:32	77.7dB	83.4dB	97.7dB	82.5dB	67.3dB
10:51:47	71.5dB	77.9dB	91.0dB	76.1dB	66.5dB
10:52:02	65.5dB	68.6dB	82.3dB	68.2dB	62.0dB
10:52:17	66.7dB	72.1dB	86.5dB	71.0dB	62.6dB
10:52:32	62.3dB	67.1dB	82.5dB	64.5dB	60.8dB
10:52:47	66.4dB	75.7dB	91.2dB	68.7dB	61.6dB
10:53:02	74.9dB	81.4dB	96.4dB	79.5dB	64.9dB
10:53:17	81.6dB	88.0dB	101.6dB	87.5dB	67.1dB
10:53:32	70.9dB	75.8dB	93.0dB	75.0dB	65.9dB
10:53:47	67.5dB	74.1dB	87.3dB	71.4dB	63.3dB
10:54:02	74.3dB	78.2dB	92.0dB	77.4dB	64.9dB
10:54:17	76.6dB	81.9dB	93.8dB	80.8dB	63.1dB
10:54:32	66.1dB	72.9dB	86.1dB	70.1dB	61.9dB
10:54:47	63.0dB	66.0dB	83.2dB	64.7dB	61.7dB
10:55:02	69.1dB	72.8dB	85.9dB	72.1dB	65.6dB
10:55:17	64.1dB	66.8dB	86.1dB	66.0dB	62.3dB
10:55:32	71.2dB	73.9dB	89.1dB	73.5dB	67.4dB
10:55:47	64.6dB	68.6dB	82.7dB	67.5dB	62.1dB
10:56:02	74.3dB	81.9dB	94.4dB	77.0dB	67.7dB
10:56:17	70.4dB	76.0dB	91.0dB	74.5dB	62.4dB
10:56:32	66.6dB	70.5dB	84.9dB	69.8dB	62.3dB
10:56:47	65.9dB	69.2dB	85.8dB	68.9dB	63.8dB
10:57:02	73.6dB	78.3dB	94.8dB	77.0dB	64.6dB
10:57:17	75.0dB	83.6dB	95.6dB	80.1dB	62.6dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Quangtri bridge (Thachhan river), Quangtri province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
15-APR-99 @ 13:35:31	15-APR-99 @ 13:43:03	0:07:32
Peak Level 111.4dB	15-APR-99 @ 13:37:28	
Max Level 82.7dB	15-APR-99 @ 13:39:07	
Min Level 60.2dB	15-APR-99 @ 13:36:51	
Overload 0.00%		

LEQ	69.6dB	SEL(3)	96.2dB	TWA	51.6dB	TAKM3	72.0dB
LDN	69.6dB	CNEL	69.6dB	Pa2Sec	1.6		
L5	74.6dB	L10	72.5dB	L50	66.3dB	L90	62.9dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 7					
13:35:46	71.5dB	73.4dB	89.1dB	72.8dB	70.2dB
13:36:01	68.8dB	73.7dB	88.6dB	72.2dB	64.8dB
13:36:16	76.8dB	81.4dB	94.1dB	80.8dB	71.7dB
13:36:31	67.2dB	70.4dB	85.2dB	69.0dB	65.3dB
13:36:46	65.7dB	70.0dB	87.8dB	68.1dB	62.3dB
13:37:01	67.0dB	75.8dB	98.4dB	71.8dB	61.1dB
13:37:16	72.4dB	77.6dB	100.1dB	76.3dB	68.1dB
13:37:31	72.8dB	80.9dB	111.4dB	76.6dB	67.7dB
13:37:46	67.6dB	72.5dB	88.9dB	71.1dB	64.4dB
13:38:01	65.8dB	70.4dB	91.1dB	67.7dB	63.1dB
13:38:16	66.1dB	69.4dB	99.7dB	69.0dB	62.6dB
13:38:31	63.9dB	67.1dB	91.6dB	65.3dB	62.3dB
13:38:46	64.4dB	66.7dB	85.6dB	66.1dB	63.0dB
13:39:01	69.8dB	73.7dB	86.9dB	72.7dB	64.2dB
13:39:16	75.4dB	82.7dB	100.7dB	79.6dB	69.8dB
13:39:31	65.4dB	70.0dB	84.7dB	67.3dB	63.2dB
13:39:46	71.8dB	78.2dB	94.8dB	74.9dB	67.4dB
13:40:01	66.0dB	70.6dB	84.0dB	68.8dB	61.3dB
13:40:16	67.3dB	71.7dB	86.5dB	71.0dB	62.9dB
13:40:31	72.4dB	78.5dB	93.9dB	75.5dB	68.8dB
13:40:46	71.2dB	77.4dB	89.7dB	74.6dB	67.0dB
13:41:01	67.4dB	71.8dB	88.3dB	70.5dB	62.3dB
13:41:16	66.4dB	71.9dB	86.3dB	70.4dB	62.1dB
13:41:31	64.5dB	66.4dB	80.9dB	65.9dB	63.2dB
13:41:46	64.3dB	66.5dB	81.3dB	65.8dB	62.4dB
13:42:01	63.0dB	63.8dB	83.1dB	63.5dB	62.3dB
13:42:16	63.6dB	65.3dB	82.4dB	64.4dB	62.7dB
13:42:31	64.9dB	67.4dB	85.6dB	66.5dB	63.1dB
13:42:46	67.0dB	69.8dB	85.6dB	69.4dB	64.4dB
13:43:01	68.4dB	72.9dB	87.9dB	70.1dB	65.3dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1, At Mychanh bridge, Quangtri province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
15-APR-99 @ 14:29:10	15-APR-99 @ 14:36:42	0:07:32
Peak Level 110.0dB	15-APR-99 @ 14:36:37	
Max Level 94.6dB	15-APR-99 @ 14:36:38	
Min Level 60.4dB	15-APR-99 @ 14:34:29	
Overload 0.00%		

LEQ	74.5dB	SEL(3)	101.0dB	TWA	56.4dB	TAKM3	76.9dB
LDN	74.5dB	CNEL	74.5dB	Pa2Sec	5.0		
L5	77.9dB	L10	75.0dB	L50	65.8dB	L90	61.9dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 8					
14:29:25	70.0dB	75.8dB	89.1dB	75.0dB	63.3dB
14:29:40	76.8dB	86.1dB	102.5dB	82.0dB	62.4dB
14:29:55	70.3dB	75.9dB	89.3dB	75.6dB	60.9dB
14:30:10	65.7dB	73.8dB	81.6dB	70.0dB	61.0dB
14:30:25	74.7dB	80.6dB	96.0dB	79.1dB	63.3dB
14:30:40	67.8dB	74.1dB	99.7dB	70.9dB	62.5dB
14:30:55	61.9dB	64.1dB	84.2dB	63.0dB	61.0dB
14:31:10	67.8dB	71.9dB	88.3dB	71.4dB	61.9dB
14:31:25	65.5dB	68.3dB	85.8dB	67.3dB	63.1dB
14:31:40	78.5dB	84.3dB	96.2dB	83.3dB	66.3dB
14:31:55	69.0dB	72.9dB	89.6dB	70.5dB	66.7dB
14:32:10	63.7dB	66.6dB	84.8dB	65.6dB	61.6dB
14:32:25	68.6dB	71.5dB	89.9dB	70.5dB	65.9dB
14:32:40	67.9dB	71.2dB	88.0dB	70.1dB	66.1dB
14:32:55	74.7dB	79.7dB	93.8dB	78.4dB	67.1dB
14:33:10	66.3dB	69.8dB	83.6dB	67.8dB	63.9dB
14:33:25	72.7dB	78.1dB	90.8dB	77.0dB	65.8dB
14:33:40	65.8dB	72.3dB	83.2dB	69.1dB	61.8dB
14:33:55	71.7dB	77.7dB	91.9dB	77.0dB	62.2dB
14:34:10	71.0dB	74.9dB	88.4dB	74.2dB	66.3dB
14:34:25	63.5dB	65.7dB	82.7dB	64.7dB	61.3dB
14:34:40	62.8dB	66.1dB	82.4dB	65.2dB	60.9dB
14:34:55	64.6dB	67.7dB	86.9dB	66.9dB	62.6dB
14:35:10	75.2dB	79.1dB	94.3dB	78.3dB	68.8dB
14:35:25	68.5dB	75.0dB	87.0dB	72.9dB	63.8dB
14:35:40	62.2dB	65.1dB	82.3dB	63.4dB	60.9dB
14:35:55	62.9dB	64.5dB	82.7dB	63.8dB	61.8dB
14:36:10	66.4dB	70.8dB	89.0dB	69.7dB	62.9dB
14:36:25	65.5dB	70.0dB	87.0dB	68.1dB	62.5dB
14:36:40	86.2dB	94.6dB	110.0dB	92.9dB	63.5dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Phuxuan bridge, Hue City, Thuathien-Hue province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
15-APR-99 @ 16:05:11	15-APR-99 @ 16:12:43	0:07:32
Peak Level 90.0dB	15-APR-99 @ 16:07:50	
Max Level 74.6dB	15-APR-99 @ 16:08:04	
Min Level 61.3dB	15-APR-99 @ 16:08:13	
Overload 0.00%		

LEQ	66.9dB	SEL(3)	93.5dB	TWA	48.9dB	TAKM3	68.0dB
LDN	66.9dB	CNEL	66.9dB	Pa2Sec	0.9		
L5	69.1dB	L10	68.6dB	L50	66.7dB	L90	64.2dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 9					
16:05:26	64.9dB	66.4dB	82.3dB	66.0dB	64.1dB
16:05:41	66.7dB	68.4dB	83.2dB	67.8dB	64.9dB
16:05:56	67.9dB	69.3dB	84.8dB	68.9dB	67.1dB
16:06:11	67.3dB	69.2dB	84.0dB	68.9dB	64.3dB
16:06:26	64.1dB	65.0dB	81.6dB	64.6dB	63.6dB
16:06:41	66.3dB	68.1dB	82.8dB	67.6dB	64.8dB
16:06:56	67.7dB	72.1dB	87.6dB	69.9dB	65.7dB
16:07:11	69.4dB	72.3dB	85.1dB	70.6dB	68.5dB
16:07:26	68.2dB	70.2dB	85.5dB	69.4dB	67.2dB
16:07:41	68.4dB	70.3dB	87.8dB	69.1dB	67.5dB
16:07:56	69.2dB	73.5dB	90.0dB	71.3dB	68.0dB
16:08:11	69.1dB	74.6dB	89.0dB	72.9dB	62.8dB
16:08:26	63.7dB	67.0dB	83.0dB	65.5dB	61.7dB
16:08:41	63.6dB	66.7dB	86.0dB	64.6dB	62.1dB
16:08:56	65.5dB	66.8dB	82.7dB	66.3dB	64.8dB
16:09:11	66.2dB	67.8dB	82.7dB	67.5dB	65.1dB
16:09:26	66.9dB	67.9dB	82.7dB	67.5dB	66.5dB
16:09:41	66.2dB	68.1dB	83.2dB	67.5dB	64.9dB
16:09:56	65.7dB	68.4dB	84.0dB	66.5dB	64.7dB
16:10:11	66.8dB	67.8dB	83.5dB	67.6dB	66.3dB
16:10:26	66.8dB	67.6dB	82.5dB	67.3dB	66.3dB
16:10:41	67.5dB	71.3dB	88.9dB	69.7dB	65.0dB
16:10:56	66.3dB	67.3dB	82.5dB	66.9dB	65.7dB
16:11:11	65.5dB	68.0dB	85.6dB	67.1dB	63.8dB
16:11:26	66.5dB	68.1dB	83.5dB	67.7dB	65.3dB
16:11:41	67.6dB	69.2dB	83.6dB	68.6dB	66.9dB
16:11:56	66.3dB	67.3dB	83.3dB	67.1dB	65.4dB
16:12:11	66.2dB	67.8dB	82.3dB	67.1dB	65.2dB
16:12:26	67.2dB	68.4dB	82.7dB	68.2dB	66.1dB
16:12:41	67.6dB	68.1dB	83.6dB	68.0dB	67.3dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Vuc bridge (km 834+433), Thuathien-Hue province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
16-APR-99 @ 08:35:38	16-APR-99 @ 08:43:10	0:07:32
Peak Level 118.3dB	16-APR-99 @ 08:38:19	
Max Level 97.1dB	16-APR-99 @ 08:39:37	
Min Level 57.6dB	16-APR-99 @ 08:42:14	
Overload 0.00%		

LEQ	76.9dB	SEL(3)	103.4dB	TWA	58.9dB	TAKM3	80.6dB
LDN	76.9dB	CNEL	76.9dB	Pa2Sec	8.8		
L5	80.7dB	L10	75.5dB	L50	64.1dB	L90	59.3dB

LOGGING (15 SEC) Study 10	LEQ	LMAX	LPK	L10	L90
08:35:53	64.9dB	71.7dB	85.6dB	69.6dB	60.0dB
08:36:08	79.0dB	87.1dB	100.4dB	84.8dB	60.7dB
08:36:23	68.4dB	71.5dB	86.6dB	70.8dB	63.0dB
08:36:38	72.4dB	81.2dB	98.0dB	77.1dB	66.4dB
08:36:53	73.3dB	77.4dB	96.7dB	77.0dB	66.9dB
08:37:08	69.6dB	76.3dB	90.2dB	73.7dB	62.2dB
08:37:23	59.7dB	61.2dB	79.0dB	60.5dB	58.9dB
08:37:38	64.3dB	73.7dB	92.4dB	64.3dB	58.9dB
08:37:53	81.8dB	90.2dB	108.8dB	87.9dB	68.9dB
08:38:08	68.1dB	73.0dB	97.8dB	72.1dB	61.3dB
08:38:23	78.4dB	89.2dB	118.3dB	84.0dB	63.1dB
08:38:38	66.1dB	74.7dB	84.8dB	69.9dB	61.9dB
08:38:53	67.1dB	70.7dB	85.8dB	69.2dB	63.4dB
08:39:08	76.6dB	82.8dB	104.7dB	80.2dB	69.7dB
08:39:23	80.7dB	89.3dB	109.2dB	87.2dB	64.1dB
08:39:38	86.0dB	97.1dB	111.6dB	92.7dB	61.7dB
08:39:53	87.0dB	97.1dB	105.9dB	92.7dB	62.3dB
08:40:08	66.2dB	71.5dB	85.9dB	70.7dB	60.1dB
08:40:23	59.0dB	61.0dB	78.6dB	60.5dB	58.3dB
08:40:38	60.6dB	64.4dB	81.1dB	62.8dB	58.2dB
08:40:53	64.1dB	70.0dB	85.8dB	68.5dB	59.7dB
08:41:08	65.8dB	69.3dB	84.2dB	68.7dB	60.8dB
08:41:23	62.7dB	66.2dB	81.3dB	65.4dB	59.6dB
08:41:38	65.1dB	70.2dB	84.2dB	68.6dB	61.1dB
08:41:53	60.9dB	64.2dB	81.0dB	62.7dB	58.9dB
08:42:08	63.7dB	67.3dB	85.7dB	66.0dB	60.7dB
08:42:23	60.0dB	67.4dB	89.8dB	59.7dB	57.8dB
08:42:38	66.3dB	69.1dB	84.4dB	68.5dB	62.6dB
08:42:53	64.7dB	70.8dB	97.7dB	68.5dB	61.3dB
08:43:08	62.3dB	66.5dB	91.9dB	64.2dB	60.3dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Truoi bridge (km 852+336), Thuathien-Hue province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
16-APR-99 @ 09:27:22	16-APR-99 @ 09:34:54	0:07:32
Peak Level 104.3dB	16-APR-99 @ 09:27:32	
Max Level 84.2dB	16-APR-99 @ 09:34:27	
Min Level 60.8dB	16-APR-99 @ 09:28:27	
Overload 0.00%		

LEQ	66.8dB	SEL(3)	93.4dB	TWA	48.8dB	TAKM3	69.4dB
LDN	66.8dB	CNEL	66.8dB	Pa2Sec	0.8		
L5	70.4dB	L10	68.6dB	L50	64.4dB	L90	62.3dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 11					
09:27:37	64.7dB	72.3dB	104.3dB	67.7dB	61.7dB
09:27:52	66.5dB	69.3dB	88.1dB	68.5dB	63.2dB
09:28:07	66.0dB	68.6dB	85.2dB	67.7dB	63.9dB
09:28:22	66.0dB	70.6dB	84.2dB	68.5dB	62.1dB
09:28:37	61.9dB	63.5dB	82.5dB	62.9dB	61.0dB
09:28:52	65.0dB	68.1dB	86.0dB	67.0dB	62.1dB
09:29:07	65.0dB	68.2dB	89.3dB	66.7dB	63.6dB
09:29:22	62.8dB	64.3dB	89.6dB	63.4dB	62.4dB
09:29:37	63.1dB	66.1dB	86.5dB	65.6dB	61.5dB
09:29:52	62.2dB	63.7dB	86.2dB	63.1dB	61.5dB
09:30:07	64.7dB	71.5dB	94.9dB	67.9dB	62.1dB
09:30:22	63.0dB	64.9dB	94.8dB	64.2dB	62.2dB
09:30:37	64.2dB	69.0dB	99.2dB	65.9dB	62.6dB
09:30:52	65.7dB	69.0dB	95.7dB	67.7dB	64.3dB
09:31:07	65.6dB	69.5dB	86.6dB	69.0dB	63.6dB
09:31:22	68.1dB	71.0dB	87.0dB	70.2dB	66.4dB
09:31:37	66.3dB	69.4dB	93.6dB	68.4dB	64.2dB
09:31:52	64.6dB	67.1dB	90.6dB	66.3dB	63.6dB
09:32:07	63.2dB	64.7dB	85.0dB	63.9dB	62.8dB
09:32:22	69.4dB	73.7dB	92.5dB	71.7dB	63.5dB
09:32:37	66.8dB	74.9dB	100.0dB	70.2dB	62.6dB
09:32:52	63.6dB	65.0dB	86.0dB	64.6dB	62.5dB
09:33:07	63.3dB	64.4dB	82.5dB	63.9dB	62.6dB
09:33:22	64.3dB	66.5dB	88.3dB	65.9dB	62.6dB
09:33:37	65.8dB	69.7dB	84.4dB	68.0dB	62.9dB
09:33:52	66.8dB	71.4dB	92.0dB	69.4dB	64.8dB
09:34:07	66.2dB	68.6dB	84.0dB	67.3dB	65.1dB
09:34:22	68.3dB	77.9dB	95.3dB	70.1dB	64.9dB
09:34:37	76.2dB	84.2dB	102.1dB	79.8dB	66.5dB
09:34:52	64.6dB	68.9dB	91.3dB	65.7dB	63.1dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1,
At Langco bridge, Thuathien-Hue province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
16-APR-99 @ 10:44:56	16-APR-99 @ 10:52:28	0:07:32
Peak Level 106.2dB	16-APR-99 @ 10:47:11	
Max Level 83.4dB	16-APR-99 @ 10:45:21	
Min Level 56.6dB	16-APR-99 @ 10:48:01	
Overload 0.00%		

LEQ	65.2dB	SEL(3)	91.7dB	TWA	47.1dB	TAKM3	68.1dB
LDN	65.2dB	CNEL	65.2dB	Pa2Sec	0.5		
L5	70.4dB	L10	67.5dB	L50	60.4dB	L90	58.5dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 12					
10:45:11	62.4dB	67.3dB	82.6dB	66.5dB	57.9dB
10:45:26	73.4dB	83.4dB	101.5dB	78.6dB	59.3dB
10:45:41	60.3dB	66.8dB	77.8dB	62.6dB	57.7dB
10:45:56	69.2dB	76.3dB	96.4dB	73.8dB	60.1dB
10:46:11	67.1dB	73.5dB	91.0dB	70.5dB	62.4dB
10:46:26	66.0dB	70.1dB	91.0dB	68.4dB	62.6dB
10:46:41	58.7dB	64.0dB	77.8dB	60.6dB	57.6dB
10:46:56	59.1dB	63.5dB	87.6dB	60.9dB	57.6dB
10:47:11	70.2dB	76.3dB	106.2dB	75.0dB	62.4dB
10:47:26	67.3dB	73.8dB	94.3dB	70.4dB	59.1dB
10:47:41	63.6dB	68.1dB	88.5dB	66.4dB	59.3dB
10:47:56	60.7dB	65.9dB	88.3dB	63.0dB	58.5dB
10:48:11	59.6dB	62.7dB	85.0dB	61.3dB	56.9dB
10:48:26	64.7dB	72.5dB	89.5dB	66.3dB	61.9dB
10:48:41	70.6dB	77.3dB	91.0dB	74.9dB	62.3dB
10:48:56	61.8dB	69.8dB	89.2dB	62.3dB	58.2dB
10:49:11	62.3dB	67.2dB	83.3dB	66.0dB	59.3dB
10:49:26	59.9dB	63.4dB	81.5dB	60.9dB	58.9dB
10:49:41	62.9dB	69.6dB	84.9dB	68.6dB	58.9dB
10:49:56	62.9dB	68.8dB	82.4dB	66.5dB	59.1dB
10:50:11	59.7dB	61.9dB	78.0dB	60.8dB	58.9dB
10:50:26	60.0dB	61.4dB	80.4dB	60.9dB	59.3dB
10:50:41	59.7dB	60.9dB	77.4dB	60.7dB	59.2dB
10:50:56	58.9dB	60.4dB	80.6dB	59.6dB	58.0dB
10:51:11	60.4dB	66.4dB	90.7dB	63.1dB	57.9dB
10:51:26	60.6dB	62.6dB	81.1dB	61.7dB	59.8dB
10:51:41	64.5dB	70.1dB	84.6dB	68.9dB	60.4dB
10:51:56	61.3dB	64.9dB	79.1dB	64.2dB	59.7dB
10:52:11	60.9dB	65.9dB	82.1dB	65.0dB	59.1dB
10:52:26	61.0dB	65.3dB	80.9dB	63.3dB	59.1dB

Appendix 3.2 (Cont.) Noise measurement at the Section 1, At Namo bridge, Danang province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
16-APR-99 @ 12:51:12	16-APR-99 @ 12:58:44	0:07:32
Peak Level 95.0dB	16-APR-99 @ 12:53:59	
Max Level 79.7dB	16-APR-99 @ 12:55:19	
Min Level 57.6dB	16-APR-99 @ 12:53:15	
Overload 0.00%		

LEQ	67.1dB	SEL(3)	93.6dB	TWA	49.0dB	TAKM3	69.7dB
LDN	67.1dB	CNEL	67.1dB	Pa2Sec	0.9		
L5	72.9dB	L10	70.5dB	L50	64.0dB	L90	58.9dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 13					
12:51:27	62.9dB	67.2dB	85.0dB	65.3dB	59.3dB
12:51:42	64.4dB	67.4dB	83.2dB	66.8dB	62.3dB
12:51:57	63.7dB	68.4dB	86.4dB	66.3dB	59.3dB
12:52:12	67.3dB	73.3dB	86.7dB	71.4dB	62.3dB
12:52:27	67.7dB	73.8dB	94.3dB	72.5dB	62.1dB
12:52:42	70.9dB	78.1dB	91.3dB	75.9dB	62.3dB
12:52:57	62.5dB	67.8dB	82.0dB	66.8dB	58.7dB
12:53:12	59.0dB	63.1dB	79.8dB	60.1dB	58.0dB
12:53:27	58.5dB	60.1dB	77.5dB	59.6dB	57.8dB
12:53:42	66.0dB	72.3dB	86.2dB	71.4dB	59.1dB
12:53:57	63.6dB	67.7dB	85.2dB	65.6dB	60.1dB
12:54:12	71.3dB	78.5dB	95.0dB	76.1dB	61.3dB
12:54:27	64.0dB	69.4dB	88.7dB	66.3dB	60.0dB
12:54:42	69.0dB	76.0dB	91.7dB	72.0dB	64.5dB
12:54:57	70.7dB	76.2dB	91.3dB	74.9dB	64.9dB
12:55:12	66.5dB	72.9dB	88.8dB	68.9dB	63.4dB
12:55:27	71.7dB	79.7dB	92.9dB	77.2dB	60.9dB
12:55:42	65.6dB	72.3dB	91.6dB	69.7dB	58.1dB
12:55:57	63.2dB	68.3dB	86.0dB	66.3dB	58.9dB
12:56:12	70.5dB	74.9dB	90.9dB	74.1dB	64.4dB
12:56:27	70.8dB	75.2dB	94.3dB	74.0dB	66.1dB
12:56:42	65.5dB	68.5dB	86.8dB	67.4dB	61.0dB
12:56:57	69.3dB	72.2dB	90.3dB	70.9dB	66.8dB
12:57:12	68.2dB	71.3dB	87.8dB	69.7dB	66.8dB
12:57:27	68.4dB	72.2dB	91.9dB	70.7dB	64.0dB
12:57:42	60.7dB	62.9dB	81.8dB	62.2dB	59.3dB
12:57:57	59.4dB	60.6dB	80.8dB	60.0dB	59.0dB
12:58:12	59.4dB	60.7dB	80.0dB	60.1dB	58.5dB
12:58:27	59.4dB	62.6dB	80.7dB	61.3dB	58.0dB
12:58:42	59.6dB	62.0dB	81.5dB	60.9dB	58.5dB

Appendix 3.3. Water quality at the Section 1

Số/No: 88/KN

Ngày/date: 22/4/1999

PHIẾU KẾT QUẢ THỬ NGHIỆM
TEST REPORT

1. TÊN MẪU (*Name of sample*): Nước

2. SỐ LƯỢNG MẪU(*Quantity of sample*): 5

3. NGÀY NHẬN MẪU (*Receiving date*) : 15/4/1999

4. KHÁCH HÀNG (*Client*): Trung tâm Bảo vệ Môi trường HCM

5. KẾT QUẢ THÍ NGHIỆM (*Test results*):

STT (Order)	TÊN CHỈ TIÊU (Characteristics)	ĐV TÍNH (Unit)	P.P.THỬ (Test method)	KẾT QUẢ KIỂM NGHIỆM (Test result)				
				ĐNM1	VDM2	TK3	CO4	TK5
1	pH		TOA WQC-22A	7,01	7,07	6,75	7,24	7,13
2	EC	µS/cm	CO 150	81,6	66,5	1599,0	55,2	114,1
3	Độ đục	mg/l	TOA WQC-22A	14	10	1	2	4
4	DO	mg/l	TOA WQC-22A	4,85	5,10	4,90	4,90	5,35
5	TSS	mg/l	Standard method 2540	34	4	4	4	6
6	NH4	mg/l	HACH 8507	0,24	0,06	0,01	0,19	0,03
7	NO3	mg/l	HACH-8039,8171	0,7	0,4	0,7	0,8	0,5
8	COD	mg/l	HACH-8000	6	7	10	7	10
9	Fe tổng	mg/l	HACH-8008	5,5	4,0	10,5	19,2	11,3
10	Cl-	mg/l	HACH-8207	6,2	4,9	407,0	7,6	5,5

GIÁM ĐỐC
Director

TRUNG TÂM BẢO VỆ MÔI TRƯỜNG

Đặng văn Lợi

TRƯỞNG PHÒNG THÍ NGHIỆM
Head of Lab.

Hoàng Thị Hòa

Appendix 3.3. (Cont.) Water quality at the Section 1

Số/No: 89/KN *Ngày/date: 22/4/1999*

PHIẾU KẾT QUẢ THỬ NGHIỆM
TEST REPORT

1. TÊN MẪU (*Name of sample*): Nước
2. SỐ LƯỢNG MẪU(*Quantity of sample*): 8
3. NGÀY NHẬN MẪU(*Receiving date*) : 16/4/1999
4. KHÁCH HÀNG (*Client*): Trung tâm Bảo vệ Môi trường HCM
5. KẾT QUẢ THÍ NGHIỆM (*Test results*):

STT (*Order*)	TÊN CHỈ TIÊU (*Characteristics*)	ĐVTÍNH (*Unit*)	P.P.THỬ (*Test method*)	KẾT QUẢ KIỂM NGHIỆM (*Test result*)							
				ĐH6	CQT7	MC8	CTT9	CV10	CT11	ĐLC12	ĐN13
1	pH		TOA WQC-22A	7,60	7,50	7,20	7,40	7,10	6,90	7,80	7,90
2	EC	uS/cm	CO 150	1700,0	100,0	26,0	49,0	40,8	26,7	3620,0	1820,0
3	Độ đục	mg/l	TOA WQC-22A	1	1	4	1	9	7	6	2
4	DO	mg/l	TOA WQC-22A	5,40	6,54	6,04	6,06	6,03	5,20	5,20	6,1
5	TSS	mg/l	Standard method 2540	20	30	70	30	130	130	240	110
6	NH4	mg/l	HACH-8507	0,09	0,04	0,06	0,05	0,23	0,17	0,19	0,01
7	NO3	mg/l	HACH-8039,8171	0,7	0,7	0,6	0,6	0,6	0,8	1,7	0,9
8	COD	mg/l	HACH-8000	6	4	4	3	19	5	*	*
9	Fe tổng	mg/l	HACH 8008	3,5	0,3	KPH	KPH	0,6	0,35	KPH	KPH
10	Cl-	mg/l	HACH-8207	640,0	8,0	6,6	8,0	11,3	6,0	18400,0	9100,0

Ghi chú: *: Mẫu nước mặn , không đo được.

KPH: Không phát hiện

GIÁM ĐỐC
Director

TRUNG TÂM BẢO VỆ MÔI TRƯỜNG

Đặng văn Lợi

TRƯỞNG PHÒNG THÍ NGHIỆM
Head of Lab.

Hoàng Thị Hòa

Appendix 3.4 Phytoplankton species identified at Project Sites of Dongha-Quangngai Section 1, April 1999

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
	CYANOPHYTA													
1.	Dactylococcopsis acicularis		+							+				
2.	Chroococcus limneticus											+		
3.	Microcystis aeruginosa	+	+	+		+						+	+	
4.	Merismopedia glauca					+								
5.	Gloeocapsa minima		+											
6.	Anabaena solitaria								+					
7.	A. affinis										+			
8.	Pseudanabaena schmidlei											+	+	
9.	Raphidiopsis mediterranea	+			+						+	+	+	+
10.	Oscillatoria acuta					+	+							
11.	O. geitleriana	+	+	+	+		+		+	+	+	+	+	+
12.	O. limosa	+												
13.	O. margaritifera								+					
14.	O. nigro-viridis								+					
15.	O. subbrevis		+		+						+	+	+	+
16.	O. tenuis								+					
17.	Trichodesmium erythraeum							+	+					
18.	Phormidium mucicola					+								
19.	P. tenue	+		+		+				+		+		+
20.	Lyngbya agardhii								+					
21.	L. birgei													+

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
22.	L. hieronymusii			+							+			
23.	L. limnetica						+					+	+	
	XANTHOPHYTA													
24.	Centritractus belonophorus				+								+	
	CHRYSOPHYTA													
25.	Dinobryon bavaricum		+		+		+				+	+	+	
26.	D. sertularia	+	+	+	+	+	+	+	+	+	+	+	+	
27.	Dictyocha fibula								+					
	BACILLARIOPHYTA													
28.	Melosira granulata		+	+	+	+	+			+	+	+	+	+
29.	M. nummuloides								+					
30.	M. undulata				+						+			
31.	M. varians		+	+	+								+	
32.	Cyclotella comta	+	+	+	+	+	+	+	+			+	+	
33.	Coscinodiscus asteromphalus							+	+					
34.	C. bipartitus							+	+					
35.	C. jonesianus							+	+					
36.	C. lineatus								+					
37.	C. spinosus								+					
38.	C. subtilis								+					
39.	Asteromphalus cleveanus								+					
40.	Lauderia borealis							+						
41.	Skeletonema costatum	+						+	+					
42.	Stephanopysix palmeriana							+						
43.	Leptocylindrus danicus	+						+	+					

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
44.	Guinardia flaccida							+	+					
45.	G. sp.							+						
46.	Rhizosolenia alata f. gracillima							+	+					
47.	R. alata f. indica							+						
48.	R. calcar-avis							+						
49.	R. hebetata f. semispina							+	+					
50.	R. hyalina							+						
51.	R. imbricata							+	+					
52.	R. longiseta												+	
53.	R. setigera							+						
54.	R. stolterfothii							+	+					
55.	R. styliformis v. latissima							+	+					
56.	Bacteriastrum comosum							+						
57.	B. delicatulum							+	+					
58.	B. hyalinum							+	+					
59.	B. varians							+						
60.	Chaetoceros abnormis								+					
61.	C. affinis								+					
62.	C. atlanticus v. neapolitana							+						
63.	C. atlanticus v. skeleton							+						
64.	C. borealis								+					
65.	C. compactum							+	+					
66.	C. compressus							+	+					
67.	C. decipiens							+	+					
68.	C. denticulatus							+						

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
69.	C. didymus v. protuberans							+	+					
70.	C. distans							+						
71.	C. diversus								+					
72.	C. indicum							+						
73.	C. lauderi							+	+					
74.	C. leavis								+					
75.	C. lorenzianus							+	+					
76.	C. paradoxus							+	+					
77.	C. peruvianus							+	+					
78.	C. peruvianus f. robusta							+	+					
79.	C. pseudocurvisetus							+	+					
80.	C. seychellarum							+	+					
81.	C. subsecundus								+					
82.	Biddulphia leavis													+
83.	B. mobiliensis							+	+					
84.	B. regia							+						
85.	B. reticulum							+	+					
86.	B. rhombus								+					
87.	Triceratium favus							+						
88.	Bellerochea indica							+						
89.	Hemiaulus membranaceus							+						
90.	H. sinensis							+	+					
91.	Cerataulina bergonii							+						
92.	Ditylum sol							+	+					
93.	Eucampia cornuta							+						

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
94.	E. zoodiacus							+						
95.	Climacodium biconcavum								+					
96.	Streptotheca thamesis							+						
97.	Fragilaria capucina	+	+	+	+	+	+			+	+	+	+	+
98.	F. crotonensis				+									
99.	Asterionella japonica							+	+					
100.	Synedra tabulata								+					
101.	S. ulna	+	+	+	+	+	+		+	+	+		+	+
102.	Thalassionema nitzschioides							+	+					
103.	Thalassiothrix frauenfeldii							+	+					
104.	T. longissima							+						
105.	Diatoma elongatum			+	+									
106.	D. hyalinum												+	
107.	Eunotia lunaris			+			+					+		
108.	Actinella guianensis												+	
109.	Achnanthes brevipes			+							+			
110.	Navicula ancilla												+	
111.	N. anglica			+										
112.	N. britannica		+											
113.	N. dissipata		+								+		+	+
114.	N. gracilis								+			+		
115.	N. lanceolata							+	+					
116.	N. menaiana			+										
117.	N. meniscus		+								+	+		
118.	N. phyllepta						+						+	+

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
119.	N. ramosissima									+				
120.	N. rhynchocephala													+
121.	N. tuscula					+				+				
122.	N. sp.											+		+
123.	Pinnularia braunii												+	
124.	P. divergens												+	
125.	P. mesolepta		+								+			
126.	P. nobilis		+										+	
127.	P. subsolaris			+			+			+		+	+	
128.	P. viridis	+		+	+								+	
129.	Stauroneis anceps						+						+	+
130.	S. anceps v. siberica			+										
131.	Trachyneis aspera v. elliptica								+					
132.	Diploneis bombus		+											
133.	D. elliptica	+	+	+	+	+	+		+			+	+	
134.	Gyrosigma acuminatum		+		+							+		
135.	G. attenuatum						+							
136.	G. balticum								+					
137.	G. littorale		+										+	
138.	G. spenceri	+	+									+		
139.	G. wansbeckii	+	+									+		+
140.	G. sp.	+	+											
141.	Pleurosigma affine							+	+					
142.	P. angulatum							+	+					
143.	P. fasciola	+	+											

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
144.	P. pelagicum	+	+	+								+		
145.	Donkinia recta								+					
146.	Amphiprora alata	+	+	+				+	+			+	+	
147.	Amphora hyalina								+					
148.	A. ostrearia v. vitrea									+	+			+
149.	Cymbella ehrenbergii			+										
150.	C. lacustris										+			
151.	C. lanceolata													+
152.	C. ventricosa	+	+			+					+	+	+	+
153.	Gomphonema longiceps v. subclavatum			+		+	+							+
154.	G. olivaceum									+				
155.	Hantzschia virgata												+	
156.	Nitzschia bilobata		+											
157.	N. closterium								+			+		
158.	N. filiformis											+		
159.	N. kuetzingiana		+											
160.	N. longissima							+	+					
161.	N. longissima v. reversa	+									+	+	+	
162.	N. lorenziana	+	+	+	+			+	+		+	+	+	
163.	N. navicularis	+						+	+					
164.	N. seriata							+	+					
165.	N. paradoxa		+					+	+		+			
166.	N sigma	+								+				
167.	N. vitrea	+												
168.	Surirella capronii		+	+									+	+

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
169.	S. elegans		+								+	+		
170.	S. ovata			+										
171.	S. smithii		+	+	+						+	+	+	+
172.	S. tenera	+	+	+	+		+						+	+
	CHLOROPHYTA													
173.	Eudorina elegans						+							
174.	Asterococcus limneticus			+	+							+	+	
175.	Schroederia setigera		+										+	
176.	Botryosphaera sudetica											+		
177.	Dictyosphaeria pulchellum	+	+		+	+	+					+	+	
178.	Coelastrum microporum	+										+	+	
179.	C. proboscideum				+									
180.	Pediastrum duplex	+	+	+	+	+	+		+			+	+	
181.	P. simplex v. clathratum		+		+		+							
182.	P. simplex v. duodenarium			+	+									
183.	P. tetras		+	+	+								+	
184.	Chodatella subsalsa	+											+	
185.	Oocystis marssonii												+	
186.	Nephrocystium lanatum						+							
187.	Ankistrodesmus angustus		+								+			
188.	A. falcatus	+									+		+	
189.	A. fusiformis				+		+						+	
190.	Closteriopsis longissima	+					+						+	+
191.	Tetraedron gracile											+		
192.	Kirchneriella lunaris			+			+							

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
193.	K. obesa												+	
194.	Scenedesmus acuminatus				+									
195.	S. arcuatus		+											
196.	S. bijuga						+							
197.	S. ecornis				+							+		
198.	S. javanensis			+			+						+	
199.	S. quadricauda			+	+	+	+					+	+	
200.	Actinastrum hantzschii	+	+	+	+								+	
201.	Ancyloma nordenskioldii											+	+	
202.	Gonatozygon aculeatum										+			
203.	G. kinahani			+	+	+	+				+			+
204.	G. pilosum									+	+			
205.	Neitrium digitus												+	
206.	Closterium acutum									+	+			
207.	C. acutum v. variabile				+					+	+			
208.	C. gracile						+							
209.	C. kuetzingii		+		+		+				+		+	
210.	C. moniliferum						+				+		+	+
211.	C. ralfsii v. hybridum												+	
212.	C. turgidum						+							
213.	Penium minutum												+	
214.	P. margatitaceum												+	
215.	Pleurotaenium ehrenbergii						+							
216.	Staurastrum arctiscon						+							
217.	S. dickiei						+					+	+	

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
218.	S. natator	+			+		+					+	+	
219.	S. oxyacanthum v. maius				+		+						+	+
220.	S. paradoxum				+		+		+				+	
221.	S. pentacerum				+		+						+	
222.	S. pentaserum v. tetracerum												+	
223.	S. protectum v. planctonicum				+		+						+	
224.	S. setigerum				+		+						+	
225.	S. subgracillium						+							
226.	S. tohopekaligense v. brevispinum												+	
227.	S. sp.				+		+						+	
228.	Micrasterias foliacea ornata						+						+	
229.	M. mahabuleswarensis v. wallichii				+									
230.	Euastrum ansatum						+							
231.	E. verrucosum		+		+									
232.	Cosmarium botrytis												+	
233.	C. circulare						+							
234.	C. contractum						+		+					
235.	C. depressum												+	
236.	C. margaritiferum	+					+							
237.	C. pseudopachydermum		+											
238.	C. subspeciosum		+	+									+	
239.	Arthrodesmus ralfsii			+									+	
240.	A. triangularis						+					+		
241.	Xanthidium freemanii						+							
242.	Onychonema miliforme						+						+	

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
243.	Desmidium grevillii		+										+	
244.	Spondylosium planum		+		+						+			+
245.	Hyalotheca dissiliens						+							
246.	H. mucosa													+
247.	Spirogyra ionia				+									+
248.	S. protecta										+			
249.	Stichococcus minutissima					+							+	
250.	Schzomeris leibleinii					+								+
251.	Pithophora oedogonia			+										
	EUGLENOPHYTA													
252.	Euglena acus			+	+	+	+			+			+	
253.	E. caudata			+		+								
254.	E. sprogyra			+								+		
255.	E. texta v. ovata										+			
256.	E. variabilis									+				
257.	E. wangi					+								
258.	Phacus acuminatus	+							+				+	
259.	P. curvicauda				+								+	
260.	P. cylindraceus					+								
261.	P. longicauda			+			+						+	
262.	P. tortus		+										+	
263.	Lepocinclis ovum					+								
264.	Trachelomonas armata						+							
265.	T. cylindrica					+								
266.	T. dubia					+					+			
267.	T. hispida			+		+								
268.	T. scabra			+										

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
269.	T. volvocina				+	+	+							
270.	Strombomonas napiformis					+								
271.	Astasia klebsii			+										
	DINOPHYTA													
272.	Prorocentrum micans								+					
273.	Dinophysis caudata							+	+					
274.	D. miles f. indica							+						
275.	Ceratium arietium							+	+					
276.	C. hirundinella				+	+								
277.	C. furca							+	+					
278.	C. fusus v. seta							+	+					
279.	C. trichoceros							+						
280.	C. tripos							+	+					
281.	Gonyaulax apiculata	+												
282.	G. spinifera								+					
283.	Glenodinium lenticula								+					
284.	G. quadridens		+	+	+		+						+	
285.	Pyrophacus horologicum								+					
286.	Peridinium depressum							+	+					
287.	P. gatunense						+							
288.	P. goslaviense	+										+		
289.	P. oceanicum								+					
290.	P. quinquecorne								+					
291.	Protoperidinium pellucidum								+					
292.	Peridinopsis sp.	+	+	+	+							+	+	
	Tổng số loài	**40**	**54**	**48**	**53**	**31**	**58**	**75**	**90**	**18**	**36**	**46**	**83**	**30**

Appendix 3.4 (cont.) Zooplankton species identified at Project Sites of Dongha-Quangngai Section 1, April 1999

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
	I. ROTATORIA													
	Philodinidae													
1.	Philodina roseola			1										
	Notommatidae													
2.	Scaridium longicaudum			6										
	Trichocercidae													
3.	Trichocerca (Diurella) tigris				47									
4.	Trichocerca (Diurella) similis				1									
5.	Trichocerca (Trichocerca) capucina											2		
6.	Trichocerca(Trichocerca) cylindrica				3									
	Synchaetidae													
7.	Bipalpus hudsoni		42											
8.	Polyarthra vulgaris		526	341	2689	5	1783			1	1	31	23	
	Asplanchnidae													
9.	Asplanchna sieboldi		3	3	355		2				43	1		
	Lecanidae													
10.	Lecane (Lecane) luna			1	1		5				6	9		
11.	Lecane (Lecane) hastata			1	2							22	3	
12.	Lecane (Monostyla) bulla			2	7		7					1	2	
	Mytilinidae													
13.	Mytilina ventralis					2	1							

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
	Brachionidae													
14.	Brachionus diversicornis												1	
15.	Brachionus falcatus										5			
16.	Platyias quadricornis												2	1
17.	Platyias patulus										1			
18.	Keratella tropica			2	39						1	4		
19.	Keratella cochlearis		142	16	691		29					62		
	Filiniidae													
20.	Tetramastix opoliensis											1		
	Hexathridae													
21.	Hexathra mira		15		4		173					197		
	II. CLADOCERA													
	Bosminidae													
22.	Bosmina longirostris		6	1		17	28				3			
23.	Bosminopsis deitersi		3		1	3	69			1	22			
24.	Diaphanosoma excisum		5								1			
25.	Diaphanosoma leuchtenbergianum										2			
	Macrothricidae													
26.	Ilyocryptus halyi					1							1	
	Daphniidae													
27.	Moina dubia													1
28.	Ceriodaphnia rigaudi		1									1		
	Chydoridae													
29.	Chydorus sphaericus					1								3
30.	Disparalona rostrata										1			
31.	Euryalona orientalis													1

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
32.	Biapertura karua		1											1
	Polyphemidae													
33.	Evadne tergestina								2					
34.	Pennilia avirostris							7	6					
	III. COPEPODA													
	Pseudodiaptomidae													
35.	Pseudodiaptomus beieri											17		
36.	Schmackeria bulbosa	3	26									2		
	Diaptomidae													
37.	Eodiaptomus draconisignivomi					5								
	Acartiidae													
38.	Acartia erythraea							4	2					
39.	Acartiella sinensis	13												
	Oithonidae													
40.	Limnoithona sinensis	1318	36									982	3	
41.	Oithona plumifera							21	64					
42.	Oithona similis							17	145					
43.	Oithona rigida	3						12	72					
	Corycaeidae													
44.	Corycaeus speciosus							77	7					
	Cyclopidae													
45.	Microcyclops varicans					1	5							
46.	Mesocyclops leuckarti				1	4								
47.	Thermocyclops hyalinus		11	3	4	48	78			2	22	9	2	2
48.	Halicyclops sp.							2						

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
	Tachidiidae													
49.	Euterpina acutifrons							3	31					
	Ectinosomidae													
50.	Microsetella norvegica							2	14					
	Eucalanidae													
51.	Eucalanus subcrassus							2						
	Paracalanidae													
52.	Acrocalanus gracilis								27					
53.	Paracalanus parvus							26	193					
54.	Paracalanus aculeatus							72	46					
	IV. OSTRACODA													
	Cypridae													
55.	Heterocypris anomala					1								
	V. DECAPODA													
	Luciferidae													
56.	Lucifer sp.							1						
	VI. CHAETOGNATHA													
	Sagittidae													
57.	Sagitta enflata							13						
	VII. PROCHORDATA													
	Appendicalaridae													
58.	Oikopleura longicauda							23	12					
59.	Oikopleura rufescens							18						
	IIX. PROTOZOA													
	Arcellidae													
60.	Arcella vulgaris					1				1				

Stt	Tên loài	Điểm thu mẫu												
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
	IX. LARVA													
61.	Nauplius copepoda	1509	656	143	48	34	532	48	170	6	32	2226	27	6
62.	Mysis	1	1	1		4								
63.	Gastropoda	19	31					6	4		1	13		
64.	Bivalvia	2	74		7				42			1		1
65.	Echinodermata							1						
66.	Polychaeta	6						11	23			8		
67.	Ephemeroptera													2
68.	Diptera			1		2	1			2	38		6	10
	Số loài	**9**	**17**	**14**	**16**	**15**	**13**	**20**	**17**	**6**	**15**	**19**	**10**	**10**
	Số lượng /mẫu	**2874**	**1579**	**522**	**3900**	**129**	**2713**	**363**	**860**	**13**	**179**	**3589**	**70**	**28**
	Số lượng /m^3	**48858**	**26843**	**8874**	**66300**	**2193**	**46121**	**6171**	**14620**	**221**	**3043**	**61013**	**1190**	**476**

Ghi chú *Vị trí các điểm thu mẫu:*

1. Cầu Đông Hà
2. Cầu Quảng Trị
3. Cầu Mỹ Chánh
4. Cầu Phú Xuân
5. Cầu Vực
6. Cầu Truồi
7. Cầu Lăng Cô
8. Cầu Nam Ô
9. Cầu Đỏ
10. Cầu Vĩnh Diện
11. Cầu Thu Bồn
12. Cầu Trà Bồng (Bình Sơn)
13. Cầu Trà Khúc (thị xã Quảng Ngãi).

Appendix 3.4 (cont.) Benthic species identified at Project Sites of Dongha-Quangngai Section 1, April 1999

Số TT	TÊN LOÀI	ĐIỂM THU MẪU											
		1	2	3	4	5	6	7	8	10	11	12	13
	A. POLYCHAETA												
	I_ Errantia												
	Nephthydidae												
01	Nephthys polybranchia (Southern)	25	2								8		
	Nereidae												
02	Ceratonereis mirabilis Kingberg								1				
	II_ Sedentaria												
	Cirratulidae												
03	Cirratulus sp.			9			1						
	Spionidae												
04	Prionospio japonicus Okuda	8							17				
	B. OLIGOCHAETA												
	Tubificidae												
05	Branchiura sowerbyi Beddard			6									
	C. CRUSTACEA												
	I_ Amphipoda												
	Gammaridae												
06	Melita sp.								4				
07	Grandidierella lignorum Barnard	2							11				
	II_ Tanaidacea												
	Apseudidae												
08	Apseudes vietnamensis Dang	1											

Số TT	TÊN LOÀI	ĐIỂM THU MẪU											
		1	2	3	4	5	6	7	8	10	11	12	13
	III_ Decapoda - Macrura												
	Palaemonidae												
09	Palaenonetes tonkinensis (Sollaud)								1				
	Penaeidae												
10	Metapenaeus ensis De Haan								1				
	IV_ Decapoda - Anomura												
	Paguridae												
11	Pagurus sp.							2					
	V_ Cumacea												
12	genus sp.	1											
	D. MOLLUSCA												
	I_ Gastropoda												
	Thiaridae												
13	Tarebia granifera (Lamarck)		1							1		3	
14	Melanoides tuberculatus (Muller)	C								C			
	Viviparidae												
15	Angulyagra boettgeri (Huede)					28							
	Neritidae												
16	Clithon oualaniensis (Lesson)	1							1		1		
	Potamididae												
17	Batillaria zonalis (Bruguière)							10					
	II_ Bivalvia												
	Mytilidae												
18	Limnoperna siamensis (Morelet)	C											

Số TT	TÊN LOÀI	ĐIỂM THU MẪU											
		1	2	3	4	5	6	7	8	10	11	12	13
	Corbiculidae												
19	Corbicula boudoni Morlet		28		1						1		
20	Corbicula castanea Morelet									C			
	Tellinidae												
21	Tellina virgata Linné	3											
	Veneridae												
22	Chione (Anomaladiens) squamosa Linné							1					
	E. INSECTA LARVA												
	I_ Hemiptera												
	Belostomatidae												
23	Sphaerodema sp.												1
	II_ Trichoptera												
	Hydropsychidae												
24	Hydropsyche sp.											1	
	III_ Diptera												
	Chironomidae												
25	Endochironomus sp.			1			7		5			22	
	Heleidae												
26	Culicoides sp.												1
	Culicidae												
27	Chaoborus sp.		1										
	Số loài	9	4	3	1	1	2	3	8	3	3	2	2
	Số lượng trong mẫu (con)	41	32	16	1	28	8	13	41	1	10	25	2
	Số lượng/m^2	**410**	**320**	**160**	**10**	**280**	**80**	**130**	**410**	**10**	**10**	**250**	**20**

* Ghi chú: vị trí các điểm thu mẫu:

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6. Cầu Truồi.
7. Cầu Lăng Cô.
8. Cầu Nam Ô.
9. Cầu Đỏ.
10. Cầu Vĩnh Điện.
11. Cầu Thu Bồn.
12. Cầu Trà Bồng.
13. Cầu Trà Khúc.

Mẫu số 9 không có động vật đáy.

Apendix 3.5. List of rare and endangered Forest vegetation and animals (issued by Regulation 18/HDBT, 17 January 1992 of the Government

Group I

IA- Forest vegetation

No	Vietnamese name	Scientific name	Notes
1	2	3	4
1	Bách xanh	Calocedrus macrolepis	
2	Thông đỏ	Taxus chinensis	
3	Phỉ 3 mũi	Cephalotaxus fortunei	
4	Thông tre	Podocarpus neriifolius	
5	Thông Pà cò	Pinus kwangtugensis	
6	Thông Đà Lạt	Pinus dalatensis	
7	Thông nước	Glyptostrobus pensilis	
8	Hinh đá vôi	Keteleeria calcarea	
9	Sam bông	Amentotaxus argotenia	
10	Sam lanh	Abies nukiangensis	
11	Trầm (gió bầu)	Aquilaria crassna	
12	Hoàng đàn	Cupressus torulosa	
13	Thông 2 lá dẹt	Ducampopinus krepfii	

Apendix 3.5 (Cont.)

IB- Forest animals

No	Vietnamese name	Scientific name	Notes
1	2	3	4
1	Tê giác 1 sừng	Rhinoceros Sondaicus	
2	Bò tót	Bos gaurus	
3	Bò xám	Bos sauveli	
4	Bò rừng	Bos bangteng	
5	Trâu rừng	Bubalus bubalis	
6	Voi	Elephas maximus	
7	Cà tong	Cervus eldi	
8	Hươu vàng	Cervus porcirus	
9	Hươu sa	Moschus moschiferus	
10	Hổ	Panthera tigris	
11	Báo hoa mai	Panthera pardus	
12	Báo Gấm	Neofelis nebulosa	
13	Gấu chó	Helarctos malayanus	
14	Vooc xám	Trachipithecus phayrei	
15	Vooc mũi hếch	Rhinopithecus avunculus	
16	Vooc ngũ sắc:		
	-Vooc ngũ sắc Trung Bộ	Pygathrix nemaeus	
	-Vooc ngũ sắc Nam Bộ	Pygathrix nigripes	
17	Vooc đen:		
	-Vooc đen má trắng	Presbytis francoisi francoisi	
	-Vooc đầu trắng	Presbytis francoisi poliocephalus	
	-Vooc mông trắng	Presbytis francoisi delacouri	
	-Vooc Hà Tĩnh	Presbytis francoisi hatinensis	
	-Vooc đen Tây Bắc	Presbytis francoisi ap	
18	Vượn đen:		
	- Vượn đen	Hylobates concolor concolor	
	- Vượn đen má trắng	Hylobates concolor leucogensis	
	- Vượn tay trắng	Hylobatas lar	
	- Vượn đen má trắng Nam Bộ	Hylobates concolor gabrienlae	
19	Chồn mực	Arctictis binturong	
20	Cầy vằn	Chrotogale owstoni	
21	Cầy gấm	Prionodon pardicolor	
22	Chồi đeri	Galeopitheeus temminski	
23	Cầy vàng	Martes flavigula	
24	Culi lua	Nycticebus pigmaeus	

Apendix 3.5 (Cont.)

No	Vietnamese name	Scientific name	Notes
25	Sóc bay:		
	- Sóc bay sao	Petaurista elegans	
	- Sóc bay trâu	Petaurista lylei	
26	Sóc bay:		
	- Sóc bay nhỏ	Belomys	
	- Sóc bay lông tai	Belomys pearsoni	
27	Sói Tây Nguyên	Canis aureus	
28	Công	Pavo muticus imperatir	
29	Gà lôi:		
	- Gà lôi	Lophura diardi diardi	
	- Gà lôi lam mào đen	Lophura imperialis Delacouri	
	- Gà lôi lam mào trắng	Lophura diardi Bouoparte	
30	Gà tiền:		
	- Gà tiền	Polyplectron bicalcaratum	
	- Gà tiền mặt đỏ	Polyplectron germaini	
31	Trĩ sao	Rheinarctia ocellata	
32	Sếu cổ trụi	Grus antigol	
33	Cá sấu nước lợ	Crocodylus porosus	
34	Cá sấu nước ngọt	Crocodylus Siamensis	
35	Hổ mang chúa	Ophiogus hannah	
36	Cá cóc Tam đảo	Paramesotriton deloustan	

Apendix 3.5 (Cont.)

Goup II

IIA- Forest vegetation

No	Vietnamese name	Scientific name	Notes
1	Cẩm lai	Dalbergia oliverrii Gamble	
	Cẩm lai Bà Rịa	Dalbergia bariaensis	
	Cẩm lai	Dalbergia oliverrii Gamble	
	Cẩm lai Đồng Nai	Dalbergia dongnaiensis	
2	Gà te (Gõ đỏ)	Afzelia xylocarpa	
3	Gụ		
	Gụ mật	Sindora cochinchinensis	Gõ mật
	Gụ lau	Sindora tonkinensis-A.Chev	Gõ lau
4	Giáng hương		
	Giáng hương	Pterocarpus pedatus Pierre	
	Giáng hương Cambốt	Pterocarpus cambodianus Pierre	
	Giáng hương mắt chim	Pterocarpus indicus Willd	
5	Lát		
	Lát hoa	Chukrasia tabularis A.juss	
	Lát da đồng	Chukrasia sp	
	Lát chun	Chukrasia sp	
6	Trắc		
	Trắc	Dalbergia cochinchinensis Pierre	
	Trắc dây	Dalbergia annamensis	
	Trắc cambốt	Dalbergia combodiana Pierre	
7	Pơ mu	Fokienia hodginsii A Henry et Thomas	
8	Mun		
	Mun	Diospyros mun Hlee	
	Mun soc	Dyospyros sp	
9	Đinh	Markhamia pierrei	
10	Sến mật	Madhuca pasquieri	
11	Nghiến	Burretiodendron hsienmu	
12	Lim xanh	Erythrophloeum fordii	
13	Kim giao	Padocarpus fleuryi	
14	Ba gạc	Rauwolfia verticillata	
15	Bá kích	Morinda officinalis	
16	Bách hợp	Lilium brownii	
17	Sâm ngọc linh	Panax vietnamnensis	
18	Sa nhân	Amomum longgiligulare	
19	Thảo quả	Amomum tsaoko	

Apendix 3.5 (Cont.)

IB- Forest animals

No	Vietnamese name	Scientific name	Notes
1	2	3	4
1	Khỉ:		
	- Khỉ cộc	Macaca arctoides	
	- Khỉ vàng	Macaca mulatta	
	- Khỉ mốc	Macaca assamensis	
	- Khỉ đuôi lợn	Macaca nemestrina	
2	Sơn dương	Capricornis sumatraensis	
3	Mèo rừng	Felis bengalensis	
		Felis marmiorata	
		Felis temmiskii	
4	Rái cá	Lutra lutra	
5	Gấu ngựa	Selenartos thibethanus	
6	Sói đỏ	Cuon alpinua	
7	Sóc đen	Ratuta bicolor	
8	Phượng hoàng đất	Buceros bicornis	
9	Rùa núi vàng	Indotestudo elongata	
10	Giải	Pelochelys bubroni	

Appendix 3.6. List of wild animals in the Namcan forest

Vietnameses Name	Scientific Name
Ech nhai	**Amphibians**
1. Coc nha	Buto melanostictus
2. Ngoc	Rana limnocharis
3. Ech cua	Rana cancrivora
4. Nhai cay	Rana macrodactyla
5. Ech dong	Rana tigriaa
6. Ech uong	Kaloula pulchra
Bo sat	**Reptiles**
1. Tran mat vong	Python reticulatus
2. Tran moc	Python molurus
3. Ran ca	Cerberus rhynchops
4. Ran nuoc	Xenochrophis piscator
5. Ran bong	Enhydris bocourti
6. Ran soc dua	Elaphe radiata
7. Ran ran ri ca	Hemalopsis buccata
8. Ran bong	Enhydris enhydris
9. Ran luc	Trimeresurus papeorum
10. Ran ho mang	Naja naja
11. Ran cap nong	Bungarus fasciatus
12. Ran mong (nung nuc)	Xenopeltis unicolor
13. Thach sung	Hemidactylus frenatus
14. Ky da	Varanus sp.
15. Than lan bong	Mabuya multifasciata
16. Rua hop Am hoa	Cuora amboinenesis
17. Rua rang	Hieremys annandalei
18. Rua ba gio	Malayemys subtrijuga

Appendix 3.6 (Cont.)

Vietnameses Name	Scientific Name
Chim	**Birds**
1. Le nau	Dendrocygna javanica
2. Diec xam	Ardea cinerea
3. Diec lua	Ardea purpurea
4. Co bo	Ardeola bacchus
5. Co xanh	Butorides striatus
6. Co ngang lon	Egretta alba
7. Co ngang nho	Egretta intermedia
8. Co ngang nho	Egretta garzetta
9. Co lua nho	Ixobrychus sinensis
10. Co nhan	Anastomus oscitans
11. Giang sen	Ibis leucocephalus
12. Hac khoang co	Ciconia episcopus
13. Quan den	Plegadis falcinellus
14. Quam trang	Threskiornis melanocephalus
15. Cu gay	Streskiornis chinensis
16. Cu ngoi	Streptopelia tranqueharica
17. Cu xanh	Treron bicincta
18. Tim vit	Cuculus merulinus
19. Bim bip	Centropus sinensis
20. Tu hu	Eudynamys scolopacea
21. Ca kheo	Hymantopus hymantopus
22. Sa khoang co	Halcyon chloris
23. Sa lon	Pelargopsis capensis
24. Dieu	Haeliatus sp
25. Dieu lua	Haeliatus indus
26. Dieu trang	Elanus caerulus
27. Cat hong trang	Polihierax insignis
28. Chim sau	Dicacum concolor
29. Nhan bung trang	Hirunda rustica
30. Nhan bien	Sterna sp
31. Chao mao	Picnonotus jocosus
32. Sao nau	Acridotheres fuscus
33. Chia voi	Motacilla alba
34. Co ran (dieng dieng)	Anhinga melanogaster

Appendix 3.6 (Cont.)

Vietnameses Name	Scientific Name
35. Bo'nong	Pelecanus sp
36. Coc de	Phalacrocodax carbo
37. Coc nho	Phalacrocodax niger
38. Go kien nau	Picoides macei
39. Ga nuoc	Gallicrex cinerea
40. Ga rung	Gallus gallus
41. Ga nuoc	Rallus striatus
Dong vat co vu	**Mammails**
1. Rai ca vuot	Lutra lutra
2. Cay huong	Viverricula indica
3. Cay giong	Viverra zibetha
4. Long tranh	Herpestes javanicus
5. Meo ri	Felis chaus
6. Meo ca	Felis viverrina
7. Chuot dat (chout lon)	Bandicota indica
8. Chuot dong	Rattus argentiventer
9. Soc bung xam	Callosciurus pygeythur
10. Soc bung do	Callosciurus erythraeus
11. Lon rung	Sus scrosa
12. Vuon	Hylobates sp
13. Ho	Panthera tigris
14. Nai	Cervus unicolor
15. Gam	Neofelis nebulosa

Source : Lê Diêu Dực, 1991

Appendix 3.7 SUMMARY OF TEXT RESULTS TAKEN ON SAMPLES COLLETED FROM CLOSE TO HIGHWAY ALIGNMENT

No.	Location of text Sites	Laboratory Text Results			Field Text Results	
		Clay type	Clay Fraction	Specific Gravity	Moisture Content	CPT
1	Can tho Canal, in the first 10 to 15km from Can Tho	Inorganic Clays and Silty Clays of medium to high plasticity (Cl to CH)	26% to 46%	2.67 to 2.69	45% to 75%	5kPa to 1m increasing uniformly to 32kPa at 6m depth
2	End to Canal to Phung Hiep	Organic Silty Clay: 1st one-third of length (Cl) 2nd one-third of length (CH) 3rd one-third of length (Cl)	 < 30% > 30% < 30%		10% to 20% at 0.50m 40% to 60% at 2m 50% to 70% at 4.5m	40kPa upper 0.5 to 1m and down to 10kPa at 6m depth
3	Phung Hiep to Bac Lieu	Organic Silty Clays: 1st half = high to very high PI (CH) 2nd half = moderate to high PI (Cl)	 20 -70% < 30%		15% to 30% at 0.50m 30% to 45% at 2m 70% to 100% at 4.5m for high PI clays moderate PI	
4	Bac lieu to Midway between Bac Lieu + Ca Mau	Organic Silty Clays: All of high to very high plasticity (CH)	> 50% indicating high organic content		10% to 25% at o.5m 70% + above at 4.5m	30kPa to 50kPa in fist 2m and 10 to 20 kPa at deeper depths.
5	Midway between Bac Lieu + Ca Mau to 12km South of Ca Mau	Oganic Silty Clays: Medium to high plasticity	 < 30%		15% to 40% at 0.5m 40% to 50% at 2m	30kPa in fist 2m and 13 to 20kPa at deeper depths.

Source: Project Interim Report, March 1999

Appendix 3.8. Air quality monitoring at the Section 2

KẾT QUẢ PHÂN TÍCH MẪU KHÍ

-------⊕O⊕-------

Nơi yêu cầu: Phòng Quản lý các dự án - Dự án Quốc lộ 1A
Địa điểm thu mẫu: Cà Mau, Bạc Liêu, Sốc Trăng, Cần Thơ
Ngày thu mẫu: 07 - 09/4/1999

Bảng kết quả đo các yếu tố vi khí hậu

STT	Ký hiệu mẫu	Ngày đo	Nhiệt độ (^oC)	Độ ẩm (%)	Tốc độ gió (m/s)
1	K_1	7/4/99	32,2	67	0,0 - 4,0
2	K_2	7/4/99	33,0	61	0,0 - 1,1
3	K_3	7/4/99	32,0	62	0,5 - 4,2
4	K_4	8/4/99	29,5	71	0,4 - 2,9
5	K_5	8/4/99	32,4	69	0,0 - 1,1
6	K_6	8/4/99	33,0	65	0,0 - 0,4
7	K_7	8/4/99	33,6	64	0,4 - 2,1
8	K_8	8/4/99	35,3	59	0,0 - 1,9
9	K_9	8/4/99	33,8	60	0,5 - 2,3
10	K_{10}	8/4/99	30,5	79	0,5 - 3,1
11	K_{11}	8/4/99	29,7	70	0,9 - 3,7
12	K_{12}	8/4/99	28,8	70	1,1 - 3,3
13	K_{13}	9/4/99	31,7	65	0,0 - 1,9
14	K_{14}	9/4/99	34,0	70	0,0 - 1,5
15	K_{15}	9/4/99	34,2	60	0,0 - 1,4

Appendix 3.8 (Cont.)

Bảng kết quả đo nồng độ các chất ô nhiễm trong không khí
Bảng kết quả đo nồng độ các chất ô nhiễm trong không khí

STT	Ký hiệu mẫu	Nồng độ chất ô nhiễm (mg/m^3)				
		Bụi	SO_2	NO_2	CO	Pb
1	K_1	0,47	0,079	0,037	4,8	$3,2 \times 10^{-4}$
2	K_2	0,38	0,061	0,023	2,7	$0,5 \times 10^{-4}$
3	K_3	0,33	0,053	0,020	4,2	$0,5 \times 10^{-4}$
4	K_4	0,51	0,075	0,035	6,5	$4,2 \times 10^{-4}$
5	K_5	0,37	0,047	0,020	1,7	$< 0,1 \times 10^{-4}$
6	K_6	0,48	0,081	0,041	3,7	$2,2 \times 10^{-4}$
7	K_7	0,40	0,063	0,025	2,5	$1,3 \times 10^{-4}$
8	K_8	0,37	0,061	0,023	1,5	$< 0,1 \times 10^{-4}$
9	K_9	0,45	0,068	0,030	3,8	$1,5 \times 10^{-4}$
10	K_{10}	0,41	0,064	0,027	1,8	$< 0,1 \times 10^{-4}$
11	K_{11}	0,39	0,073	0,042	4,7	$< 0,1 \times 10^{-4}$
12	K_{12}	0,35	0,060	0,025	1,8	$< 0,1 \times 10^{-4}$
13	K_{13}	0,66	0,081	0,045	7,2	$3,0 \times 10^{-4}$
14	K_{14}	0,35	0,071	0,037	4,1	$< 0,1 \times 10^{-4}$
15	K_{15}	0,31	0,075	0,035	4,3	$< 0,1 \times 10^{-4}$

Appendix 3.8 (Cont.)

Bảng kết quả đo độ ồn (mức âm tương đương liên tục theo đặc tính A)

STT	Ký hiệu mẫu	Ngày thu mẫu	LEQ (dBA)	LMAX (dBA)	LMIN (dBA)	LPK (dBA)
1	K_1	7/4/99	72,8	85,8	60,5	103,1
2	K_2	7/4/99	71,4	81,1	65,5	101,9
3	K_3	7/4/99	71,3	83,6	51,6	101,8
4	K_4	8/4/99	72,0	89,6	59,5	102,3
5	K_5	8/4/99	72,0	89,2	59,6	107,3
6	K_6	8/4/99	76,6	94,3	62,8	117,8
7	K_7	8/4/99	68,6	82,4	52,1	99,3
8	K_8	8/4/99	69,0	85,3	52,5	111,8
9	K_9	8/4/99	73,4	86,8	62,6	101,7
10	K_{10}	8/4/99	73,1	79,3	69,2	100,5
11	K_{11}	8/4/99	75,8	94,4	62,4	113,0
12	K_{12}	8/4/99	72,9	90,2	58,1	108,5
13	K_{13}	9/4/99	74,1	95,1	54,5	111,5
14	K_{14}	9/4/99	76,1	95,5	59,7	116,1
15	K_{15}	9/4/99	72,8	90,6	62,3	111,6

(Có các bảng diễn biến ồn tích phân kèm theo cho từng vị trí)

Location of air sampling

Các vị trí thu mẫu:

K_1 - Cầu Năm Căn, thị trấn Năm Căn, huyện Ngọc Hiển, tỉnh Cà Mau.
K_2 - Cầu Cái Nước, huyện Cái Nước, tỉnh Cà Mau.
K_3 - Cầu Tân Đức, Km 2260, tỉnh Cà Mau.
K_4 - Cầu Ghềnh Hào, Thị xã Cà Mau
K_5 - Cầu Láng Trâm, km 2231 (ấp Nhân dân, xã Tân Phong), tỉnh Bạc Liêu.
K_6 - Cầu Hộ Phòng, km 2216 +218, Bạc Liêu.
K_7 - Cầu Cái Hữu, km 2196+680, ấp 15, xã Vĩnh Mỹ B, huyện Vĩnh Lợi, Bạc Liêu.
K_8 - Cầu Cái Dầy, km 2174+581, ấp Xẻo Chính, xã Châu Thới, Vĩnh Lợi, Bạc Liêu.
K_9 - Cầu Phú Lộc, km 2163+681, ấp 2, thị trấn Phú Lộc, huyện Thạnh Trị, Sóc Trăng.
K_{10} - Cầu Nu Gia, km 2149+221, Thạnh Phú, Sóc Trăng.
K_{11} - Cầu Khánh Hưng, gần nhà máy Bia Sóc Trăng.
K_{12} - Cầu Ba Vinh, km 2109+065.
K_{13} - Thị trấn Phụng Hiệp.
K_{14} - Cầu Rạch Nhum, km 2089+265, Long Thạnh, Phụng Hiệp, Cần Thơ.
K_{15} - Cầu Cái Răng, Cần Thơ.

Ngày 23 tháng 4 năm1999
K/T-*Phòng Giám Sát & Khống Chế*
Ô Nhiễm Không Khí

Nguyễn Thành Vinh

Appendix 3.9. Noise measurement at the Section 2,
At Namcan bridge, Camau province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
07-APR-99 @ 12:48:33	07-APR-99 @ 12:56:05	0:07:32
Peak Level 103.1dB	07-APR-99 @ 12:51:46	
Max Level 85.8dB	07-APR-99 @ 12:51:45	
Min Level 60.5dB	07-APR-99 @ 12:48:59	
Overload 0.00%		

LEQ	72.8dB	SEL(3)	99.4dB	TWA	54.8dB	TAKM3	75.1dB
LDN	72.8dB	CNEL	72.8dB	Pa2Sec	3.4		
L5	78.5dB	L10	76.9dB	L50	70.1dB	L90	64.5dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 1					
12:48:48	72.4dB	79.6dB	94.5dB	77.8dB	63.3dB
12:49:03	72.9dB	79.5dB	98.4dB	76.7dB	61.7dB
12:49:18	72.9dB	78.1dB	96.2dB	76.7dB	65.1dB
12:49:33	74.8dB	79.0dB	98.2dB	77.1dB	70.8dB
12:49:48	71.0dB	76.2dB	93.1dB	74.1dB	67.7dB
12:50:03	72.9dB	80.1dB	97.3dB	77.4dB	67.9dB
12:50:18	72.8dB	76.4dB	93.7dB	75.0dB	70.6dB
12:50:33	66.5dB	70.4dB	84.8dB	69.1dB	64.2dB
12:50:48	65.9dB	70.6dB	93.4dB	67.9dB	63.2dB
12:51:03	64.7dB	67.7dB	87.9dB	66.2dB	63.5dB
12:51:18	71.2dB	77.8dB	91.8dB	76.6dB	63.1dB
12:51:33	69.8dB	74.7dB	88.8dB	71.3dB	66.9dB
12:51:48	77.3dB	85.8dB	103.1dB	81.1dB	65.5dB
12:52:03	76.6dB	82.4dB	99.7dB	79.0dB	71.9dB
12:52:18	75.0dB	79.7dB	90.0dB	78.8dB	66.8dB
12:52:33	75.7dB	81.5dB	98.4dB	80.1dB	68.4dB
12:52:48	72.2dB	76.4dB	96.2dB	74.8dB	68.1dB
12:53:03	77.2dB	79.2dB	99.2dB	78.7dB	74.9dB
12:53:18	76.7dB	83.0dB	102.8dB	81.3dB	68.6dB
12:53:33	73.3dB	80.5dB	98.0dB	79.0dB	65.3dB
12:53:48	71.1dB	75.3dB	92.9dB	73.1dB	68.7dB
12:54:03	70.8dB	72.5dB	90.4dB	72.3dB	68.5dB
12:54:18	69.7dB	71.7dB	87.8dB	71.0dB	68.1dB
12:54:33	67.5dB	69.4dB	84.9dB	68.7dB	66.5dB
12:54:48	71.1dB	75.4dB	91.5dB	74.3dB	66.9dB
12:55:03	64.9dB	67.0dB	89.0dB	65.9dB	63.6dB
12:55:18	65.7dB	69.3dB	90.3dB	67.4dB	63.2dB
12:55:33	66.3dB	70.2dB	87.2dB	69.2dB	63.3dB
12:55:48	70.7dB	74.3dB	91.8dB	73.1dB	68.4dB
12:56:03	72.8dB	75.5dB	92.1dB	74.1dB	71.4dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2, At Cainuoc bridge, Camau province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
07-APR-99 @ 15:11:45	07-APR-99 @ 15:19:17	0:07:32
Peak Level 101.9dB	07-APR-99 @ 15:13:35	
Max Level 81.1dB	07-APR-99 @ 15:13:36	
Min Level 65.5dB	07-APR-99 @ 15:11:51	
Overload 0.00%		

LEQ	71.4dB	SEL(3)	97.9dB	TWA	53.3dB	TAKM3	72.4dB
LDN	71.4dB	CNEL	71.4dB	Pa2Sec	2.4		
L5	77.0dB	L10	75.1dB	L50	68.6dB	L90	66.6dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 2					
15:12:00	67.4dB	71.6dB	93.5dB	68.7dB	65.7dB
15:12:15	68.6dB	72.9dB	92.4dB	70.7dB	66.3dB
15:12:30	68.2dB	71.7dB	91.5dB	69.9dB	66.3dB
15:12:45	75.1dB	80.4dB	100.3dB	79.4dB	68.2dB
15:13:00	71.4dB	73.9dB	89.6dB	73.2dB	69.1dB
15:13:15	68.7dB	69.6dB	85.4dB	69.1dB	68.1dB
15:13:30	71.9dB	76.6dB	89.6dB	75.0dB	68.8dB
15:13:45	78.1dB	81.1dB	101.9dB	80.7dB	70.4dB
15:14:00	68.2dB	69.3dB	84.7dB	69.1dB	67.1dB
15:14:15	70.2dB	72.2dB	86.8dB	71.9dB	69.1dB
15:14:30	76.5dB	78.6dB	95.2dB	78.3dB	73.6dB
15:14:45	71.6dB	75.6dB	91.9dB	74.2dB	68.8dB
15:15:00	69.2dB	70.5dB	89.2dB	70.2dB	67.9dB
15:15:15	70.6dB	73.1dB	89.0dB	72.3dB	68.0dB
15:15:30	67.1dB	68.2dB	90.2dB	67.7dB	66.7dB
15:15:45	71.6dB	76.1dB	92.4dB	75.0dB	67.1dB
15:16:00	76.3dB	79.3dB	101.3dB	78.1dB	72.1dB
15:16:15	71.2dB	72.4dB	93.0dB	72.1dB	70.3dB
15:16:30	68.7dB	70.5dB	87.8dB	69.6dB	67.3dB
15:16:45	66.7dB	67.2dB	82.7dB	67.0dB	66.5dB
15:17:00	69.7dB	74.7dB	91.0dB	72.4dB	66.5dB
15:17:15	73.7dB	76.2dB	94.7dB	75.7dB	70.8dB
15:17:30	68.1dB	70.6dB	83.8dB	68.9dB	67.2dB
15:17:45	66.9dB	67.5dB	83.1dB	67.3dB	66.5dB
15:18:00	66.9dB	67.9dB	82.9dB	67.5dB	66.4dB
15:18:15	67.2dB	69.6dB	88.7dB	68.2dB	66.4dB
15:18:30	66.7dB	67.1dB	83.2dB	66.9dB	66.5dB
15:18:45	66.7dB	67.9dB	87.2dB	67.3dB	66.3dB
15:19:00	67.0dB	67.9dB	82.3dB	67.6dB	66.7dB
15:19:15	67.9dB	68.6dB	84.0dB	68.4dB	67.5dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Tanduc bridge (km 2260), Camau province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
07-APR-99 @ 16:42:10	07-APR-99 @ 16:49:42	0:07:32
Peak Level 101.8dB	07-APR-99 @ 16:44:58	
Max Level 83.6dB	07-APR-99 @ 16:44:56	
Min Level 51.6dB	07-APR-99 @ 16:42:11	
Overload 0.00%		

LEQ	71.3dB	SEL(3)	97.9dB	TWA	53.3dB	TAKM3	74.2dB
LDN	71.3dB	CNEL	71.3dB	Pa2Sec	2.4		
L5	78.0dB	L10	75.9dB	L50	64.6dB	L90	51.6dB

LOGGING (15 SEC) Study 3	LEQ	LMAX	LPK	L10	L90
16:42:25	52.6dB	54.8dB	82.1dB	53.8dB	51.6dB
16:42:40	51.6dB	51.6dB	76.6dB	51.6dB	51.6dB
16:42:55	51.6dB	52.1dB	77.1dB	51.6dB	51.6dB
16:43:10	51.6dB	51.6dB	76.5dB	51.6dB	51.6dB
16:43:25	51.6dB	51.6dB	77.2dB	51.6dB	51.6dB
16:43:40	51.6dB	51.6dB	77.0dB	51.6dB	51.6dB
16:43:55	51.6dB	51.6dB	76.8dB	51.6dB	51.6dB
16:44:10	51.6dB	51.6dB	76.4dB	51.6dB	51.6dB
16:44:25	51.6dB	51.7dB	77.1dB	51.6dB	51.6dB
16:44:40	73.4dB	80.2dB	100.5dB	79.6dB	51.6dB
16:44:55	75.2dB	81.6dB	98.8dB	79.0dB	70.3dB
16:45:10	78.0dB	83.6dB	101.8dB	82.1dB	64.4dB
16:45:25	70.9dB	78.4dB	95.1dB	76.9dB	58.6dB
16:45:40	68.6dB	73.8dB	93.0dB	72.0dB	60.1dB
16:45:55	75.3dB	82.1dB	99.1dB	80.0dB	58.5dB
16:46:10	75.1dB	82.2dB	97.4dB	78.9dB	66.5dB
16:46:25	74.0dB	81.5dB	94.9dB	76.6dB	69.0dB
16:46:40	71.1dB	78.2dB	94.5dB	75.1dB	56.1dB
16:46:55	64.6dB	70.7dB	87.6dB	68.2dB	55.4dB
16:47:10	71.4dB	74.9dB	89.8dB	73.9dB	67.7dB
16:47:25	74.7dB	79.5dB	97.2dB	77.9dB	66.9dB
16:47:40	75.5dB	80.7dB	95.6dB	77.9dB	72.7dB
16:47:55	67.3dB	75.9dB	89.1dB	72.9dB	53.6dB
16:48:10	67.5dB	73.3dB	90.6dB	72.0dB	59.5dB
16:48:25	67.4dB	73.8dB	91.4dB	70.3dB	63.0dB
16:48:40	73.2dB	77.8dB	92.4dB	76.0dB	61.5dB
16:48:55	69.5dB	73.8dB	92.0dB	72.5dB	62.8dB
16:49:10	66.8dB	74.7dB	92.0dB	71.2dB	58.8dB
16:49:25	72.3dB	80.3dB	98.7dB	79.1dB	55.7dB
16:49:40	69.8dB	76.0dB	90.7dB	72.5dB	65.1dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Ganhhao bridge, Camau province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 08:27:45	08-APR-99 @ 08:35:17	0:07:32
Peak Level 102.3dB	08-APR-99 @ 08:33:37	
Max Level 89.6dB	08-APR-99 @ 08:33:36	
Min Level 59.5dB	08-APR-99 @ 08:29:05	
Overload 0.00%		

LEQ	72.0dB	SEL(3)	98.5dB	TWA	53.9dB	TAKM3	74.4dB
LDN	72.0dB	CNEL	72.0dB	Pa2Sec	2.8		
L5	75.7dB	L10	74.2dB	L50	69.2dB	L90	64.4dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 5					
08:28:00	72.7dB	79.9dB	94.1dB	77.0dB	66.1dB
08:28:15	63.7dB	66.4dB	84.2dB	65.1dB	62.0dB
08:28:30	66.1dB	69.8dB	87.5dB	69.2dB	63.2dB
08:28:45	69.5dB	74.2dB	92.2dB	73.1dB	65.7dB
08:29:00	67.3dB	72.1dB	88.7dB	70.8dB	62.9dB
08:29:15	64.3dB	69.4dB	94.9dB	68.1dB	60.2dB
08:29:30	68.2dB	71.4dB	87.9dB	70.0dB	65.8dB
08:29:45	71.0dB	74.1dB	93.1dB	73.4dB	67.2dB
08:30:00	72.3dB	75.4dB	92.8dB	74.7dB	67.3dB
08:30:15	70.5dB	76.0dB	95.1dB	73.6dB	65.7dB
08:30:30	71.5dB	75.6dB	91.8dB	74.7dB	68.4dB
08:30:45	65.1dB	69.4dB	85.0dB	68.1dB	62.7dB
08:31:00	66.5dB	68.6dB	83.9dB	67.7dB	65.1dB
08:31:15	72.0dB	76.7dB	92.2dB	75.8dB	65.5dB
08:31:30	70.2dB	72.1dB	88.7dB	71.9dB	68.7dB
08:31:45	69.2dB	72.1dB	87.7dB	71.7dB	67.1dB
08:32:00	73.5dB	76.9dB	94.0dB	76.3dB	68.4dB
08:32:15	71.0dB	76.0dB	91.2dB	74.2dB	65.6dB
08:32:30	71.0dB	75.0dB	90.0dB	74.0dB	65.6dB
08:32:45	68.2dB	70.5dB	86.2dB	69.9dB	66.2dB
08:33:00	69.9dB	75.2dB	93.2dB	72.4dB	65.9dB
08:33:15	72.0dB	78.3dB	93.5dB	76.7dB	63.3dB
08:33:30	71.1dB	75.5dB	92.9dB	73.5dB	67.3dB
08:33:45	81.3dB	89.6dB	102.3dB	87.1dB	73.6dB
08:34:00	69.7dB	73.5dB	92.2dB	71.0dB	68.5dB
08:34:15	71.0dB	72.7dB	88.5dB	72.3dB	69.7dB
08:34:30	71.1dB	75.3dB	92.5dB	73.5dB	68.0dB
08:34:45	70.6dB	75.7dB	88.9dB	74.5dB	66.1dB
08:35:00	75.7dB	81.6dB	98.0dB	80.8dB	68.8dB
08:35:15	71.4dB	73.9dB	90.7dB	73.4dB	68.6dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Langtram bridge (km 2231), Tanphong, Baclieu province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 09:38:08	08-APR-99 @ 09:45:40	0:07:32
Peak Level 107.3dB	08-APR-99 @ 09:42:09	
Max Level 89.2dB	08-APR-99 @ 09:42:08	
Min Level 59.6dB	08-APR-99 @ 09:42:59	
Overload 0.00%		

LEQ	72.0dB	SEL(3)	98.5dB	TWA	53.9dB	TAKM3	74.9dB
LDN	72.0dB	CNEL	72.0dB	Pa2Sec	2.8		
L5	77.4dB	L10	75.1dB	L50	67.9dB	L90	62.8dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 6					
09:38:23	65.0dB	68.6dB	92.9dB	66.9dB	62.3dB
09:38:38	66.7dB	70.0dB	85.4dB	69.6dB	61.4dB
09:38:53	67.3dB	69.2dB	87.4dB	68.6dB	65.5dB
09:39:08	77.2dB	80.9dB	96.2dB	80.6dB	67.9dB
09:39:23	67.6dB	72.3dB	89.0dB	70.7dB	63.5dB
09:39:38	69.4dB	73.1dB	91.0dB	72.2dB	65.5dB
09:39:53	68.5dB	71.4dB	92.0dB	70.8dB	65.6dB
09:40:08	65.1dB	68.8dB	85.3dB	68.4dB	61.5dB
09:40:23	64.8dB	68.1dB	86.0dB	67.3dB	62.1dB
09:40:38	75.3dB	78.2dB	92.4dB	77.8dB	72.7dB
09:40:53	73.9dB	76.7dB	93.1dB	75.6dB	68.9dB
09:41:08	71.8dB	78.6dB	99.9dB	75.2dB	64.8dB
09:41:23	74.8dB	79.4dB	98.5dB	78.6dB	70.5dB
09:41:38	72.8dB	76.5dB	90.8dB	75.3dB	67.7dB
09:41:53	64.9dB	68.4dB	84.0dB	67.9dB	61.3dB
09:42:08	70.4dB	76.8dB	95.3dB	73.9dB	65.1dB
09:42:23	78.4dB	89.2dB	107.3dB	83.6dB	66.1dB
09:42:38	68.5dB	72.7dB	85.6dB	71.0dB	63.6dB
09:42:53	65.8dB	69.7dB	84.4dB	68.5dB	61.9dB
09:43:08	65.8dB	71.6dB	87.5dB	69.4dB	59.9dB
09:43:23	75.4dB	83.4dB	102.1dB	79.7dB	67.3dB
09:43:38	66.7dB	70.1dB	85.1dB	68.9dB	63.6dB
09:43:53	71.8dB	77.8dB	90.8dB	75.7dB	63.6dB
09:44:08	68.9dB	78.9dB	92.1dB	74.5dB	60.9dB
09:44:23	72.9dB	75.9dB	90.2dB	74.9dB	69.6dB
09:44:38	70.8dB	75.7dB	96.5dB	74.4dB	66.0dB
09:44:53	67.5dB	69.5dB	87.9dB	68.9dB	65.3dB
09:45:08	66.7dB	72.7dB	89.3dB	68.7dB	61.9dB
09:45:23	77.1dB	85.7dB	97.1dB	82.2dB	65.8dB
09:45:38	64.4dB	69.2dB	84.2dB	66.6dB	61.3dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Hophong bridge (km 2216+218), Baclieu province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 10:22:31	08-APR-99 @ 10:30:03	0:07:32
Peak Level 117.8dB	08-APR-99 @ 10:22:35	
Max Level 94.3dB	08-APR-99 @ 10:22:34	
Min Level 62.8dB	08-APR-99 @ 10:29:48	
Overload 0.00%		

LEQ	76.6dB	SEL(3)	103.2dB	TWA	58.6dB	TAKM3	79.4dB
LDN	76.6dB	CNEL	76.6dB	Pa2Sec	8.3		
L5	79.7dB	L10	76.8dB	L50	71.4dB	L90	66.5dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 7					
10:22:46	89.0dB	94.3dB	117.8dB	92.3dB	77.8dB
10:23:01	76.7dB	81.0dB	93.6dB	80.6dB	68.8dB
10:23:16	75.2dB	85.2dB	106.0dB	80.0dB	66.9dB
10:23:31	73.6dB	79.9dB	105.0dB	76.7dB	69.9dB
10:23:46	68.6dB	74.5dB	88.4dB	70.6dB	65.5dB
10:24:01	71.4dB	75.7dB	89.4dB	74.0dB	68.6dB
10:24:16	69.2dB	72.4dB	96.0dB	71.3dB	66.8dB
10:24:31	71.9dB	77.8dB	95.5dB	74.3dB	67.2dB
10:24:46	73.7dB	80.7dB	94.5dB	79.0dB	65.2dB
10:25:01	71.8dB	75.8dB	98.0dB	74.5dB	63.8dB
10:25:16	72.1dB	78.1dB	98.1dB	76.1dB	66.9dB
10:25:31	70.8dB	76.8dB	93.2dB	75.4dB	65.1dB
10:25:46	73.2dB	77.0dB	94.1dB	75.2dB	69.8dB
10:26:01	70.7dB	75.8dB	89.8dB	74.2dB	66.9dB
10:26:16	68.9dB	72.5dB	89.2dB	71.4dB	65.8dB
10:26:31	76.7dB	83.6dB	98.8dB	79.8dB	73.9dB
10:26:46	73.0dB	77.1dB	92.6dB	74.7dB	70.0dB
10:27:01	71.3dB	73.9dB	90.2dB	73.3dB	69.0dB
10:27:16	74.5dB	82.4dB	101.5dB	78.1dB	69.9dB
10:27:31	71.7dB	80.1dB	97.3dB	75.8dB	64.9dB
10:27:46	71.7dB	74.9dB	91.3dB	74.6dB	67.1dB
10:28:01	73.8dB	77.9dB	91.3dB	76.9dB	69.6dB
10:28:16	70.6dB	73.4dB	89.3dB	71.9dB	68.6dB
10:28:31	76.0dB	85.7dB	102.9dB	81.9dB	68.6dB
10:28:46	75.7dB	81.8dB	93.7dB	77.8dB	72.8dB
10:29:01	74.3dB	77.0dB	95.4dB	76.0dB	72.6dB
10:29:16	72.1dB	81.2dB	99.6dB	74.1dB	65.3dB
10:29:31	74.3dB	78.9dB	97.1dB	76.4dB	72.8dB
10:29:46	70.6dB	76.3dB	100.2dB	74.4dB	63.6dB
10:30:01	66.5dB	70.7dB	101.4dB	69.1dB	63.8dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Caihua bridge (km 2196+680), Vinhloi, Baclieu province

Measuring Parameters:

Range	50-110dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 11:09:38	08-APR-99 @ 11:17:10	0:07:32
Peak Level 99.3dB	08-APR-99 @ 11:10:21	
Max Level 82.4dB	08-APR-99 @ 11:10:20	
Min Level 52.1dB	08-APR-99 @ 11:11:18	
Overload 0.00%		

LEQ	68.6dB	SEL(3)	95.1dB	TWA	50.5dB	TAKM3	71.2dB
LDN	68.6dB	CNEL	68.6dB	Pa2Sec	1.3		
L5	74.7dB	L10	72.3dB	L50	65.2dB	L90	57.3dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 8					
11:09:53	58.3dB	67.2dB	87.9dB	63.6dB	52.9dB
11:10:08	62.3dB	68.9dB	87.0dB	66.7dB	57.9dB
11:10:23	74.7dB	82.4dB	99.3dB	79.0dB	67.0dB
11:10:38	66.8dB	74.7dB	84.2dB	69.3dB	61.0dB
11:10:53	72.3dB	78.2dB	98.6dB	77.7dB	62.9dB
11:11:08	67.0dB	74.4dB	89.5dB	73.3dB	53.2dB
11:11:23	64.1dB	70.9dB	89.1dB	68.7dB	53.3dB
11:11:38	71.6dB	76.7dB	97.7dB	76.1dB	58.2dB
11:11:53	63.0dB	70.3dB	89.9dB	67.1dB	57.7dB
11:12:08	67.5dB	70.6dB	86.9dB	70.1dB	63.0dB
11:12:23	66.1dB	69.0dB	84.9dB	68.1dB	62.5dB
11:12:38	68.2dB	75.1dB	90.4dB	74.1dB	59.7dB
11:12:53	69.9dB	77.2dB	91.5dB	73.3dB	63.0dB
11:13:08	69.8dB	75.1dB	98.2dB	73.6dB	64.0dB
11:13:23	69.5dB	76.1dB	96.1dB	73.8dB	59.4dB
11:13:38	68.6dB	77.0dB	90.3dB	74.0dB	56.3dB
11:13:53	58.3dB	66.3dB	78.0dB	62.8dB	53.6dB
11:14:08	65.2dB	70.2dB	85.4dB	68.9dB	59.8dB
11:14:23	68.2dB	73.1dB	93.0dB	71.6dB	64.9dB
11:14:38	66.2dB	70.2dB	88.6dB	69.4dB	60.8dB
11:14:53	67.4dB	71.8dB	90.0dB	69.8dB	64.0dB
11:15:08	67.1dB	71.3dB	88.4dB	69.9dB	58.1dB
11:15:23	61.9dB	67.5dB	82.0dB	65.0dB	56.9dB
11:15:38	66.9dB	69.4dB	84.8dB	69.1dB	63.8dB
11:15:53	73.5dB	80.0dB	97.7dB	79.0dB	61.7dB
11:16:08	71.1dB	78.4dB	89.0dB	74.4dB	62.3dB
11:16:23	67.1dB	71.7dB	84.9dB	70.7dB	59.6dB
11:16:38	63.7dB	71.0dB	87.4dB	68.0dB	57.2dB
11:16:53	68.9dB	76.6dB	96.7dB	72.8dB	62.2dB
11:17:08	65.9dB	69.9dB	88.5dB	68.8dB	62.3dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Caiday bridge (km 2174+581), Vinhloi, Baclieu province

Measuring Parameters:

Range	50-110dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 13:11:13	08-APR-99 @ 13:18:45	0:07:32
Peak Level 111.8dB	08-APR-99 @ 13:13:29	
Max Level 85.3dB	08-APR-99 @ 13:14:31	
Min Level 52.5dB	08-APR-99 @ 13:16:45	
Overload 0.00%		

LEQ	69.0dB	SEL(3)	95.6dB	TWA	51.0dB	TAKM3	72.4dB
LDN	69.0dB	CNEL	69.0dB	Pa2Sec	1.4		
L5	74.0dB	L10	70.0dB	L50	62.2dB	L90	57.1dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 9					
13:11:28	75.2dB	84.4dB	101.1dB	80.5dB	60.0dB
13:11:43	65.3dB	70.4dB	88.2dB	67.2dB	62.9dB
13:11:58	59.1dB	66.5dB	81.3dB	61.9dB	54.5dB
13:12:13	61.7dB	64.0dB	80.4dB	62.9dB	59.6dB
13:12:28	60.4dB	64.7dB	85.1dB	63.3dB	58.1dB
13:12:43	67.3dB	70.4dB	83.3dB	70.1dB	61.9dB
13:12:58	65.6dB	70.1dB	85.2dB	68.2dB	59.9dB
13:13:13	63.1dB	67.4dB	89.4dB	66.3dB	58.3dB
13:13:28	60.9dB	64.4dB	89.6dB	62.7dB	57.1dB
13:13:43	72.0dB	81.7dB	111.8dB	76.9dB	63.5dB
13:13:58	68.3dB	74.6dB	90.4dB	70.4dB	65.9dB
13:14:13	64.9dB	70.6dB	85.5dB	69.9dB	59.7dB
13:14:28	67.0dB	71.1dB	86.0dB	70.1dB	59.7dB
13:14:43	76.4dB	85.3dB	105.1dB	81.8dB	57.9dB
13:14:58	59.7dB	64.8dB	80.6dB	63.2dB	55.7dB
13:15:13	59.5dB	63.1dB	80.2dB	62.3dB	55.1dB
13:15:28	67.6dB	73.2dB	89.1dB	70.3dB	63.1dB
13:15:43	62.7dB	67.7dB	89.3dB	65.4dB	58.2dB
13:15:58	74.8dB	83.8dB	104.3dB	78.7dB	59.3dB
13:16:13	77.5dB	84.2dB	104.6dB	83.3dB	63.1dB
13:16:28	64.2dB	67.2dB	83.6dB	66.7dB	61.0dB
13:16:43	59.4dB	63.0dB	82.2dB	61.5dB	54.0dB
13:16:58	57.4dB	61.8dB	77.6dB	61.2dB	52.8dB
13:17:13	60.4dB	65.1dB	84.9dB	63.9dB	55.0dB
13:17:28	58.2dB	60.5dB	78.6dB	59.9dB	56.4dB
13:17:43	61.0dB	64.9dB	78.1dB	64.1dB	57.0dB
13:17:58	59.7dB	63.4dB	78.7dB	62.3dB	57.1dB
13:18:13	65.3dB	73.6dB	87.7dB	68.9dB	58.1dB
13:18:28	64.1dB	69.3dB	83.1dB	68.3dB	58.0dB
13:18:43	67.0dB	71.6dB	86.6dB	70.7dB	59.1dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Phuloc bridge (km 2163+681), Thanhtri, Soctrang province

Measuring Parameters:

Range	50-110dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 13:41:36	08-APR-99 @ 13:49:08	0:07:32
Peak Level 101.7dB	08-APR-99 @ 13:46:23	
Max Level 86.8dB	08-APR-99 @ 13:43:59	
Min Level 62.6dB	08-APR-99 @ 13:48:20	
Overload 0.00%		

LEQ	73.4dB	SEL(3)	99.9dB	TWA	55.3dB	TAKM3	74.9dB
LDN	73.4dB	CNEL	73.4dB	Pa2Sec	3.9		
L5	78.0dB	L10	76.9dB	L50	70.9dB	L90	66.8dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 10					
13:41:51	68.8dB	70.9dB	88.7dB	70.5dB	68.0dB
13:42:06	71.5dB	74.7dB	95.8dB	73.2dB	69.7dB
13:42:21	72.3dB	78.6dB	95.5dB	75.5dB	68.8dB
13:42:36	67.8dB	68.9dB	82.4dB	68.3dB	67.5dB
13:42:51	67.1dB	69.8dB	94.4dB	68.2dB	66.0dB
13:43:06	71.1dB	75.6dB	88.2dB	74.7dB	66.5dB
13:43:21	68.1dB	71.7dB	88.0dB	69.9dB	66.2dB
13:43:36	68.5dB	71.4dB	91.3dB	69.9dB	66.5dB
13:43:51	70.9dB	76.3dB	89.6dB	75.5dB	64.7dB
13:44:06	78.7dB	86.8dB	100.2dB	84.3dB	66.0dB
13:44:21	72.4dB	73.6dB	92.1dB	73.4dB	71.8dB
13:44:36	70.0dB	72.6dB	87.0dB	72.2dB	68.0dB
13:44:51	67.7dB	70.3dB	90.5dB	68.7dB	66.7dB
13:45:06	72.0dB	73.2dB	91.1dB	73.0dB	70.3dB
13:45:21	76.7dB	79.8dB	91.7dB	79.2dB	72.8dB
13:45:36	76.9dB	79.6dB	94.8dB	79.1dB	74.6dB
13:45:51	76.5dB	77.5dB	89.7dB	77.2dB	75.7dB
13:46:06	76.8dB	78.3dB	91.3dB	78.0dB	75.0dB
13:46:21	75.2dB	80.2dB	101.5dB	77.1dB	73.6dB
13:46:36	77.7dB	79.0dB	101.7dB	78.8dB	75.7dB
13:46:51	74.7dB	76.3dB	90.8dB	76.1dB	71.8dB
13:47:06	74.7dB	77.8dB	94.8dB	76.4dB	72.0dB
13:47:21	73.6dB	78.4dB	96.3dB	75.9dB	69.0dB
13:47:36	70.3dB	74.0dB	87.0dB	72.9dB	67.8dB
13:47:51	66.6dB	69.4dB	86.2dB	68.1dB	64.6dB
13:48:06	72.3dB	78.1dB	100.5dB	74.7dB	69.2dB
13:48:21	67.6dB	70.3dB	85.7dB	69.7dB	64.1dB
13:48:36	70.6dB	75.2dB	88.7dB	73.4dB	67.1dB
13:48:51	72.1dB	79.8dB	95.7dB	75.6dB	67.1dB
13:49:06	71.0dB	74.6dB	90.8dB	73.5dB	67.5dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Nugia bridge (km 2149+221), Thanhphu, Soctrang province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 14:29:59	08-APR-99 @ 14:37:31	0:07:32
Peak Level 100.5dB	08-APR-99 @ 14:30:07	
Max Level 79.3dB	08-APR-99 @ 14:32:16	
Min Level 69.2dB	08-APR-99 @ 14:36:45	
Overload 0.00%		

LEQ	73.1dB	SEL(3)	99.7dB	TWA	55.1dB	TAKM3	74.0dB
LDN	73.1dB	CNEL	73.1dB	Pa2Sec	3.7		
L5	76.2dB	L10	75.5dB	L50	72.4dB	L90	70.6dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 11					
14:30:14	72.4dB	75.8dB	100.5dB	74.2dB	70.8dB
14:30:29	72.7dB	77.4dB	100.0dB	75.9dB	70.3dB
14:30:44	72.6dB	78.6dB	98.5dB	74.5dB	69.8dB
14:30:59	71.9dB	72.3dB	87.7dB	72.1dB	71.5dB
14:31:14	71.9dB	74.1dB	93.2dB	72.5dB	71.2dB
14:31:29	72.6dB	75.6dB	89.2dB	74.1dB	71.6dB
14:31:44	72.1dB	72.8dB	97.0dB	72.3dB	71.8dB
14:31:59	72.3dB	73.7dB	90.0dB	72.7dB	71.8dB
14:32:14	74.0dB	76.8dB	96.4dB	75.2dB	72.3dB
14:32:29	74.9dB	79.3dB	96.2dB	78.1dB	72.7dB
14:32:44	72.9dB	74.7dB	92.7dB	74.0dB	72.2dB
14:32:59	71.5dB	72.0dB	86.4dB	71.7dB	71.2dB
14:33:14	71.9dB	74.0dB	95.1dB	72.6dB	70.9dB
14:33:29	71.8dB	75.1dB	94.3dB	73.7dB	69.9dB
14:33:44	72.0dB	75.6dB	91.0dB	73.5dB	70.2dB
14:33:59	73.0dB	74.2dB	89.6dB	73.6dB	72.5dB
14:34:14	73.9dB	75.1dB	91.1dB	74.8dB	73.0dB
14:34:29	73.7dB	74.6dB	88.7dB	74.3dB	73.2dB
14:34:44	74.2dB	75.4dB	90.0dB	75.3dB	73.5dB
14:34:59	75.6dB	76.6dB	91.1dB	76.3dB	75.1dB
14:35:14	76.3dB	76.8dB	91.0dB	76.7dB	76.1dB
14:35:29	75.5dB	76.1dB	90.8dB	75.9dB	75.0dB
14:35:44	75.0dB	75.8dB	95.8dB	75.5dB	74.5dB
14:35:59	74.2dB	77.1dB	93.0dB	76.5dB	71.9dB
14:36:14	71.4dB	72.1dB	86.8dB	71.8dB	70.9dB
14:36:29	71.1dB	73.1dB	93.3dB	72.4dB	70.1dB
14:36:44	69.7dB	70.0dB	86.2dB	69.9dB	69.5dB
14:36:59	70.4dB	72.8dB	98.8dB	71.3dB	69.6dB
14:37:14	71.2dB	72.0dB	91.5dB	71.7dB	70.8dB
14:37:29	72.5dB	73.1dB	87.2dB	72.9dB	72.1dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Khanhhung bridge, Soctrang province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 15:25:59	08-APR-99 @ 15:33:31	0:07:32
Peak Level 113.0dB	08-APR-99 @ 15:31:24	
Max Level 94.4dB	08-APR-99 @ 15:29:08	
Min Level 62.4dB	08-APR-99 @ 15:29:44	
Overload 0.00%		

LEQ	75.8dB	SEL(3)	102.4dB	TWA	57.8dB	TAKM3	79.6dB
LDN	75.8dB	CNEL	75.8dB	Pa2Sec	6.9		
L5	81.1dB	L10	78.1dB	L50	69.9dB	L90	64.4dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 12					
15:26:14	71.7dB	77.7dB	92.0dB	76.2dB	64.8dB
15:26:29	76.7dB	85.1dB	97.8dB	82.0dB	67.3dB
15:26:44	76.6dB	82.0dB	99.3dB	80.3dB	69.6dB
15:26:59	73.6dB	78.7dB	99.1dB	77.8dB	69.8dB
15:27:14	67.0dB	69.0dB	82.8dB	68.1dB	66.4dB
15:27:29	71.2dB	75.0dB	89.0dB	74.1dB	68.7dB
15:27:44	73.1dB	77.0dB	93.5dB	76.3dB	70.3dB
15:27:59	68.0dB	71.7dB	88.3dB	70.8dB	66.0dB
15:28:14	65.6dB	69.6dB	83.2dB	68.0dB	63.4dB
15:28:29	69.3dB	72.7dB	94.7dB	71.6dB	66.9dB
15:28:44	67.1dB	72.2dB	88.3dB	71.3dB	63.8dB
15:28:59	66.6dB	70.7dB	84.4dB	69.3dB	64.4dB
15:29:14	84.3dB	94.4dB	111.3dB	89.6dB	69.4dB
15:29:29	70.0dB	74.8dB	88.2dB	73.5dB	64.4dB
15:29:44	66.5dB	71.7dB	84.8dB	70.4dB	62.9dB
15:29:59	66.1dB	70.8dB	86.5dB	70.4dB	62.8dB
15:30:14	69.3dB	73.6dB	91.0dB	72.5dB	65.0dB
15:30:29	73.2dB	77.2dB	97.4dB	75.9dB	70.3dB
15:30:44	73.2dB	78.0dB	95.4dB	76.7dB	65.5dB
15:30:59	67.2dB	70.2dB	85.4dB	69.8dB	64.6dB
15:31:14	64.6dB	67.5dB	85.7dB	65.3dB	64.0dB
15:31:29	83.6dB	93.9dB	113.0dB	88.6dB	68.2dB
15:31:44	78.6dB	89.8dB	106.1dB	77.4dB	70.9dB
15:31:59	81.2dB	88.3dB	98.0dB	82.6dB	77.8dB
15:32:14	77.0dB	83.1dB	95.7dB	82.4dB	70.9dB
15:32:29	71.2dB	79.6dB	93.6dB	76.2dB	63.8dB
15:32:44	77.0dB	83.8dB	98.6dB	80.2dB	72.8dB
15:32:59	76.6dB	82.3dB	108.9dB	80.7dB	68.4dB
15:33:14	69.6dB	75.2dB	96.8dB	74.2dB	64.3dB
15:33:29	69.5dB	73.6dB	87.8dB	71.5dB	66.7dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2, At Barinh bridge

Measuring Parameters:

Range	50-110dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
08-APR-99 @ 16:12:01	08-APR-99 @ 16:19:33	0:07:32
Peak Level 108.5dB	08-APR-99 @ 16:12:41	
Max Level 90.2dB	08-APR-99 @ 16:12:40	
Min Level 58.1dB	08-APR-99 @ 16:17:11	
Overload 0.00%		

LEQ	72.9dB	SEL(3)	99.5dB	TWA	54.9dB	TAKM3	75.8dB
LDN	72.9dB	CNEL	72.9dB	Pa2Sec	3.5		
L5	79.0dB	L10	76.6dB	L50	68.4dB	L90	61.7dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 13					
16:12:16	66.4dB	70.6dB	91.2dB	69.7dB	59.8dB
16:12:31	68.1dB	73.6dB	94.5dB	72.5dB	63.3dB
16:12:46	79.9dB	90.2dB	108.5dB	85.1dB	64.3dB
16:13:01	67.3dB	74.2dB	93.1dB	70.9dB	63.1dB
16:13:16	74.6dB	81.2dB	95.6dB	80.0dB	64.4dB
16:13:31	77.0dB	84.8dB	103.1dB	82.0dB	67.7dB
16:13:46	77.2dB	84.9dB	100.9dB	82.2dB	64.1dB
16:14:01	68.8dB	74.3dB	87.8dB	72.6dB	63.4dB
16:14:16	74.9dB	80.7dB	101.0dB	79.2dB	64.4dB
16:14:31	74.3dB	79.1dB	93.7dB	78.7dB	65.6dB
16:14:46	73.3dB	77.7dB	98.1dB	77.0dB	66.0dB
16:15:01	70.7dB	80.5dB	100.0dB	75.3dB	64.1dB
16:15:16	68.2dB	72.7dB	89.9dB	70.9dB	61.2dB
16:15:31	76.4dB	81.9dB	103.7dB	81.0dB	66.3dB
16:15:46	73.0dB	79.1dB	94.9dB	75.3dB	68.4dB
16:16:01	74.8dB	80.4dB	92.6dB	79.2dB	67.3dB
16:16:16	66.0dB	74.8dB	87.9dB	70.0dB	61.4dB
16:16:31	66.3dB	74.3dB	92.1dB	71.9dB	60.9dB
16:16:46	67.2dB	72.1dB	89.1dB	71.6dB	60.2dB
16:17:01	69.1dB	73.7dB	91.6dB	72.2dB	64.0dB
16:17:16	64.3dB	70.1dB	91.4dB	68.6dB	58.4dB
16:17:31	68.6dB	70.2dB	93.3dB	69.7dB	67.2dB
16:17:46	75.3dB	84.4dB	103.7dB	78.8dB	67.6dB
16:18:01	69.4dB	74.7dB	91.8dB	72.6dB	64.5dB
16:18:16	67.1dB	72.6dB	88.4dB	71.3dB	60.4dB
16:18:31	64.5dB	69.6dB	89.3dB	68.0dB	60.0dB
16:18:46	72.8dB	77.7dB	98.3dB	75.1dB	69.5dB
16:19:01	71.1dB	77.1dB	91.4dB	75.9dB	62.1dB
16:19:16	65.2dB	73.3dB	89.8dB	67.8dB	61.0dB
16:19:31	74.3dB	79.8dB	93.2dB	78.8dB	68.1dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2, At Phunghiep townlet, Cantho province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
09-APR-99 @ 09:42:00	09-APR-99 @ 09:49:32	0:07:32
Peak Level 111.5dB	09-APR-99 @ 09:43:02	
Max Level 95.1dB	09-APR-99 @ 09:43:01	
Min Level 54.5dB	09-APR-99 @ 09:48:21	
Overload 0.00%		

LEQ	74.1dB	SEL(3)	100.6dB	TWA	56.0dB	TAKM3	77.8dB
LDN	74.1dB	CNEL	74.1dB	Pa2Sec	4.6		
L5	79.8dB	L10	75.7dB	L50	67.1dB	L90	61.5dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 14					
09:42:15	71.5dB	76.1dB	91.2dB	75.4dB	61.6dB
09:42:30	76.7dB	83.2dB	98.9dB	81.5dB	61.7dB
09:42:45	73.2dB	80.2dB	92.6dB	77.8dB	65.4dB
09:43:00	67.5dB	71.7dB	89.1dB	70.2dB	63.6dB
09:43:15	84.9dB	95.1dB	111.5dB	90.2dB	72.4dB
09:43:30	76.1dB	85.7dB	107.2dB	81.2dB	62.8dB
09:43:45	66.0dB	70.3dB	86.7dB	68.8dB	62.6dB
09:44:00	70.6dB	72.9dB	90.3dB	72.5dB	68.0dB
09:44:15	70.0dB	72.4dB	89.3dB	71.9dB	66.8dB
09:44:30	69.8dB	75.4dB	91.5dB	73.8dB	66.3dB
09:44:45	75.5dB	80.2dB	92.6dB	79.2dB	68.1dB
09:45:00	76.6dB	85.3dB	100.1dB	81.1dB	69.5dB
09:45:15	78.4dB	85.7dB	107.9dB	82.7dB	69.6dB
09:45:30	71.9dB	79.3dB	96.0dB	76.9dB	64.9dB
09:45:45	62.5dB	65.8dB	84.1dB	64.0dB	60.3dB
09:46:00	67.1dB	69.2dB	83.9dB	69.0dB	64.4dB
09:46:15	66.9dB	73.6dB	87.2dB	69.6dB	63.0dB
09:46:30	65.2dB	69.5dB	98.9dB	68.7dB	59.3dB
09:46:45	78.1dB	87.1dB	101.4dB	84.0dB	63.6dB
09:47:00	63.5dB	67.2dB	83.8dB	65.9dB	61.1dB
09:47:15	70.6dB	75.1dB	88.9dB	74.4dB	63.3dB
09:47:30	62.9dB	65.2dB	81.4dB	64.5dB	61.6dB
09:47:45	69.1dB	74.3dB	92.8dB	73.0dB	62.8dB
09:48:00	68.4dB	69.4dB	84.0dB	69.2dB	66.4dB
09:48:15	61.4dB	68.4dB	85.4dB	65.5dB	57.4dB
09:48:30	59.7dB	66.1dB	83.8dB	63.4dB	55.3dB
09:48:45	67.1dB	70.1dB	86.7dB	69.7dB	63.9dB
09:49:00	66.4dB	73.3dB	93.7dB	70.4dB	61.5dB
09:49:15	66.7dB	72.5dB	89.6dB	70.9dB	62.3dB
09:49:30	63.2dB	65.8dB	81.9dB	65.1dB	60.8dB

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Rachnhum bridge (km 2089+265), Phunghiep, Cantho province

Measuring Parameters:

Range	50-110dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
09-APR-99 @ 10:43:11	09-APR-99 @ 10:50:43	0:07:32
Peak Level 116.1dB	09-APR-99 @ 10:46:49	
Max Level 95.5dB	09-APR-99 @ 10:46:48	
Min Level 59.7dB	09-APR-99 @ 10:43:12	
Overload 0.01%		

LEQ	76.1dB	SEL(3)	102.7dB	TWA	58.1dB	TAKM3	79.6dB
LDN	76.1dB	CNEL	76.1dB	Pa2Sec	7.5		
L5	81.9dB	L10	78.1dB	L50	70.7dB	L90	63.9dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90	
Study 15						
10:43:26	70.8dB	77.9dB	99.5dB	75.9dB	61.9dB	
10:43:41	71.9dB	77.8dB	94.6dB	76.1dB	68.1dB	
10:43:56	67.6dB	73.8dB	87.0dB	71.8dB	63.2dB	
10:44:11	67.0dB	72.8dB	87.2dB	71.1dB	62.8dB	
10:44:26	73.5dB	81.4dB	102.5dB	79.0dB	62.8dB	
10:44:41	74.7dB	79.7dB	99.9dB	78.7dB	69.3dB	
10:44:56	64.1dB	69.8dB	83.9dB	67.2dB	61.7dB	
10:45:11	70.0dB	74.7dB	87.8dB	74.1dB	65.2dB	
10:45:26	68.7dB	74.3dB	90.0dB	73.3dB	63.0dB	
10:45:41	81.1dB	90.9dB	111.2dB	85.5dB	67.8dB	
10:45:56	64.2dB	67.8dB	92.4dB	65.9dB	62.5dB	
10:46:11	68.1dB	75.4dB	92.8dB	70.7dB	64.4dB	
10:46:26	67.1dB	72.1dB	92.4dB	69.9dB	63.1dB	
10:46:41	69.4dB	72.9dB	88.2dB	72.0dB	64.5dB	
10:46:56	85.5dB	95.5dB	116.1dB	91.2dB	71.0dB	OL
10:47:11	69.6dB	74.2dB	96.7dB	72.0dB	65.2dB	
10:47:26	74.8dB	79.0dB	95.8dB	77.8dB	71.6dB	
10:47:41	73.4dB	78.2dB	100.1dB	76.4dB	69.3dB	
10:47:56	81.4dB	85.5dB	111.4dB	84.3dB	73.3dB	
10:48:11	83.0dB	88.2dB	111.3dB	86.8dB	75.0dB	
10:48:26	74.6dB	79.9dB	97.1dB	77.8dB	68.3dB	
10:48:41	72.4dB	75.3dB	92.6dB	74.0dB	70.5dB	
10:48:56	72.5dB	78.4dB	97.3dB	75.3dB	69.4dB	
10:49:11	73.5dB	78.3dB	90.6dB	75.6dB	70.5dB	
10:49:26	72.8dB	77.4dB	91.1dB	76.5dB	68.2dB	
10:49:41	71.3dB	74.4dB	94.8dB	72.7dB	69.7dB	
10:49:56	72.8dB	75.7dB	90.5dB	74.8dB	69.9dB	
10:50:11	78.0dB	85.8dB	99.1dB	83.9dB	69.8dB	
10:50:26	71.1dB	73.8dB	88.8dB	72.7dB	68.5dB	
10:50:41	69.5dB	74.7dB	92.6dB	71.7dB	66.4dB	

Appendix 3.9 (Cont.) Noise measurement at the Section 2,
At Cairang bridge, Cantho province

Measuring Parameters:

Range	60-120dB	Weighting	A	Time Constant	SLOW
Threshold	OFF	Exchange Rate	3dB	Peak Weighting	A

Session Started	Session Stopped	Run Time
09-APR-99 @ 11:40:15	09-APR-99 @ 11:47:47	0:07:32
Peak Level 111.6dB	09-APR-99 @ 11:46:45	
Max Level 90.6dB	09-APR-99 @ 11:46:45	
Min Level 62.3dB	09-APR-99 @ 11:46:31	
Overload 0.00%		

LEQ	72.8dB	SEL(3)	99.4dB	TWA	54.8dB	TAKM3	75.6dB
LDN	72.8dB	CNEL	72.8dB	Pa2Sec	3.4		
L5	76.5dB	L10	74.8dB	L50	70.4dB	L90	67.0dB

LOGGING (15 SEC)	LEQ	LMAX	LPK	L10	L90
Study 16					
11:40:30	68.9dB	73.3dB	85.0dB	70.2dB	67.1dB
11:40:45	71.0dB	73.7dB	88.2dB	72.6dB	68.4dB
11:41:00	74.0dB	77.8dB	93.6dB	75.8dB	71.2dB
11:41:15	76.6dB	81.8dB	97.7dB	80.9dB	70.2dB
11:41:30	74.6dB	80.8dB	94.0dB	78.4dB	70.0dB
11:41:45	72.6dB	77.8dB	93.1dB	76.2dB	66.5dB
11:42:00	72.8dB	76.3dB	91.6dB	75.4dB	68.8dB
11:42:15	72.4dB	76.4dB	92.4dB	74.5dB	70.1dB
11:42:30	72.4dB	74.8dB	90.3dB	74.1dB	69.4dB
11:42:45	68.5dB	71.3dB	87.3dB	70.6dB	66.3dB
11:43:00	67.9dB	70.2dB	89.4dB	69.7dB	66.2dB
11:43:15	68.2dB	73.0dB	91.0dB	68.8dB	67.2dB
11:43:30	70.3dB	73.9dB	89.0dB	72.7dB	65.0dB
11:43:45	70.7dB	73.9dB	90.1dB	73.6dB	67.6dB
11:44:00	67.1dB	73.0dB	87.4dB	69.0dB	64.5dB
11:44:15	73.0dB	76.1dB	90.2dB	75.2dB	69.6dB
11:44:30	69.6dB	71.8dB	86.4dB	71.5dB	65.5dB
11:44:45	69.7dB	73.6dB	92.3dB	72.3dB	67.1dB
11:45:00	71.7dB	73.8dB	88.2dB	73.5dB	69.9dB
11:45:15	70.5dB	74.3dB	89.6dB	72.0dB	66.3dB
11:45:30	69.3dB	71.1dB	86.2dB	70.3dB	68.1dB
11:45:45	71.6dB	74.4dB	90.7dB	73.3dB	68.6dB
11:46:00	75.2dB	77.2dB	92.8dB	76.8dB	73.7dB
11:46:15	71.5dB	74.2dB	92.0dB	73.1dB	70.2dB
11:46:30	68.1dB	71.4dB	93.0dB	70.6dB	63.1dB
11:46:45	74.8dB	89.0dB	111.6dB	74.0dB	62.5dB
11:47:00	81.3dB	90.6dB	107.2dB	85.3dB	69.4dB
11:47:15	71.7dB	75.8dB	90.1dB	74.9dB	68.4dB
11:47:30	69.0dB	71.2dB	87.1dB	70.9dB	67.3dB
11:47:45	69.6dB	72.0dB	85.2dB	71.0dB	67.7dB

Appendix 3.10. Water quality monitoring at the Section 2

Số TT	PP kiểm KN / KH mẫu	Kết quả									
		PH	SS (mg/l)	Độ đục (FTU)	COD (mgO_2/l)	Fe_{tc} (mg/l)	NO_3^--N (mgN/l)	SO_4^{2-} (mg/l)	Al (mg/l)	Cl (mg/l)	P tổng (mg/l)
		Máy đo pH 330	Máy DR 2000	Máy DR 2000	So màu DR2000	So màu DR 2000	So màu DR 2000	So màu DR2000	So màu DR2000	Chuẩn độ	So màu
1	1	7,51	42	32	16	0,51	0,8	1.800	0,23	18.500	0,399
2	2	7,39	70	60	13	0,86	1,2	1.120	0,19	13.200	0,782
3	3	7,35	28	27	17	0,90	0,7	1.360	0,19	18.800	0,685
4	4	7,24	33	33	12	1,08	0,9	1.120	0,18	12.600	0,596
5	5	7,16	23	23	11	0,39	0,6	1.440	0,21	12.700	0,712
6	6	7,24	24	23	14	0,35	0,7	1.590	0,20	15.100	0,572
7	7	7,39	26	27	5	0,39	0,6	1.500	0,22	15.200	0,633
8	8	7,59	47	53	7	2,27	0,9	134	0,24	650	0,651
9	9	7,41	70	98	6	2,66	1,1	80	0,27	570	0,374
10	10	7,21	26	27	7	0,69	0,5	156	0,23	1.640	0,106
11	11	7,16	13	16	9	0,79	0,4	128	0,24	1.100	0,602
12	12	7,42	62	82	20	1,72	1,1	51	0,27	110	0,313
13	13	7,39	53	65	12	1,34	0,9	27	0,27	40	0,183
14	14	7,32	145	150	21	3,13	1,8	29	0,28	41	0,295
15	15	7,36	30	31	9	0,58	0,6	21	0,22	40,5	0,393

TRƯỞNG TRẠM

TRẠM GIÁM SÁT MÔI TRƯỜNG

Ký Quang Vinh

KIỂM NGHIỆM VIÊN

Phạm Nam Huân

Appendix 3.11 **Phytoplankton species identified at Project Sites of Cantho-Namcan Section 2, April 1999**

Stt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
	CYANOPHYTA															
1.	Dactylococcopsis acicularis								+							
2.	D. irregularis								+							
3.	Microcystis aeruginosa											+		+		+
4.	Merismopedia glauca											+				
5.	Gloeocapsa minima								+							
6.	Gomphosphaeria lacustris											+				
7.	Anabaena affinis										+					
8.	A. solitaria									+						
9.	Pseudanabaena schmidlei														+	
10.	Rhaphidiopsis curvata										+	+				
11.	R. mediterranea								+		+					
12.	Oscillatoria acuta			+			+		+	+	+	+	+			+
13.	O. bonnemaisonii							+								
14.	O. geitleriana	+		+	+			+	+	+	+	+	+	+	+	+
15.	O. limnetica										+		+			
16.	O. margaritifera			+	+	+		+	+							
17.	O. nigro-viridis					+	+							+		
18.	O. princeps	+					+					+		+		
19.	O. proboscidea			+		+										

Appendix 3.11 (Cont.)

Stt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
20.	O. salina					+										
21.	O. subbrevis								+	+	+	+		+	+	+
22.	O. tenuis											+			+	
23.	Trichodesmium erythraeum		+		+	+	+									
24.	Spirulina major												+			
25.	Arthrospira jenneri											+				
26.	Phormidium mucicola								+							
27.	P. tenue							+								
28.	Lyngbya hieronymusii		+										+	+		
29.	L. limnetica		+	+										+		
	BACILLARIOPHYTA															
30.	Melosira granulata															+
31.	M. nummuloides				+											
32.	M. varians														+	
33.	Cyclotella comta	+	+	+	+	+		+				+		+		+
34.	Coscinodiscus asteromphalus	+	+		+									+		+
35.	C. bipartitus	+														
36.	C. janischii					+									+	
37.	C. jonesianus	+														
38.	C. radiatus	+														
39.	C. subtilis	+		+										+		+
40.	Thalassiosira pacifica							+								
41.	Skeletonema costatum				+	+	+	+								
42.	Rhizosolenia alata f. gracillima	+						+								

Appendix 3.11 (Cont.)

Stt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
43.	R. alata f. indica	+														
44.	R. setigera							+								
45.	Chaetoceros compactum							+								
46.	C. pseudocurvisetus							+								
47.	C. subtilis		+													
48.	Ditylum sol							+								
49.	Streptotheca thamesis	+														
50.	Fragilaria capucina								+		+	+				
51.	Synedra acus													+		
52.	S. tabulata			+												
53.	Thalassionema nitzschioides	+						+								
54.	Licmophora abbreviata														+	
55.	Eunotia lunaris													+		
56.	Actinella guianensis				+	+							+			
57.	Achnanthes brevipes			+												
58.	A. exigua							+								
59.	Rhoicosphenia curvata			+												
60.	Campyloneis grevillei	+														
61.	Navicula cuspidata										+					
62.	N. granii	+		+												
63.	N. inclementis														+	
64.	N. peregrina				+		+				+	+				
65.	Pinnularia braunii									+						
66.	P. divergens												+	+		

Appendix 3.11 (Cont.)

Stt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
67.	P. mesolepta												+	+		
68.	Caloneis sp.	+														
69.	Gyrosigma acuminatum				+											
70.	G. attenuatum	+		+	+			+								
71.	G. sp.					+										
72.	Pleurosigma angulatum						+								+	
73.	P. fasciola					+	+					+			+	
74.	P. naviculaceum														+	
75.	P. pelagicum	+			+			+								
76.	Amphiprora alata	+														
77.	Pseudoamphiprora stauroptera									+						
78.	Amphora arenicola							+								+
79.	A. ostrearia var. vitrea	+											+		+	
80.	Gomphonema olivaceum														+	
81.	Tropidoneis antarctica			+												
82.	Epithemia turgida var. granulata													+		
83.	Nitzschia bilobata													+		
84.	N. closterium				+			+		+	+	+	+			
85.	N. filiformis											+		+		
86.	N. kuetzingiana									+	+		+		+	
87.	N. longissima									+						
88.	N. longissima var. reversa								+	+	+	+				
89.	N. lorenziana	+		+	+	+	+	+			+		+	+		+
90.	N. paradoxa			+			+									

Appendix 3.11 (Cont.)

Stt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
91.	N. seriata							+								
92.	N. sigma			+	+						+		+			
93.	Surirella capronii															+
94.	S. ovalis													+		
	CHLOROPHYTA															
95.	Volvox aureus														+	+
96.	Asterococcus limneticus											+				
97.	Pediastrum tetras											+				
98.	Ankistrodesmus arcuatus										+					+
99.	Closteriopsis longissima								+		+	+				
100.	Kirchneriella obesa									+						
101.	Crucigenia puadrata											+				
102.	Actinastrum hantzschii								+		+	+				
103.	Gonatozygon kinahani					+										
104.	Closterium acutum					+			+							
105.	C. acutum var. variabile								+	+	+			+		+
106.	C. kuetzingii							+								
107.	Spirogyra ionia												+			
108.	Ulothrix zonata					+										+
109.	Stigeoclonium lubricum											+				+
110.	Enteromorpha tubulosa			+												
111.	Schizomeris leibleinii			+												
	EUGLENOPHYTA															
112.	Euglena acus							+	+	+	+	+			+	

Appendix 3.11 (Cont.)

Stt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
113.	E. allorgei								+				+		+	
114.	E. caudata								+	+	+	+				
115.	E. rostrifera									+						
116.	E. spirogyra								+	+					+	
117.	E. texta								+							
118.	E. tripteris								+			+				
119.	E. wangi										+	+				
120.	Phacus acuminatus								+			+				
121.	P. curvicauda								+			+				
122.	P. contortus								+							
123.	P. helicoides								+							
124.	P. suecicus								+							
125.	Trachelomonas dubia								+							
126.	T. ensifera											+				
127.	T. hispida								+	+						
128.	T. intermedia									+						
129.	T. scabra								+							
130.	T. volvocina		+		+				+		+	+	+			
131.	Strombomonas lanceolata														+	
132.	S. longicauda								+							
133.	S. napiformis								+							
134.	Astasia klebsii								+							
135.	Euglenopsis vorax									+		+				
	DINOPHYTA															
136.	Peridinium bispinum							+								
	Tổng số loài	**20**	**7**	**18**	**16**	**15**	**10**	**23**	**33**	**19**	**23**	**32**	**16**	**20**	**19**	**16**

SỐ LƯỢNG THỰC VẬT PHIÊU SINH Ở SÔNG RẠCH THEO TUYẾN QUỐC LỘ 1 TỪ CẦN THƠ ĐẾN NĂM CĂN (CÀ MAU)

Tháng 4 - 1999

Appendix 3.11 (Cont.)

Điểm thu mẫu	Số lượng (tb/m^3)	Loài ưu thế	Số lượng loài ưu thế (tb/m^3)
1	12.500	Cyclotella comta	1.700
2	92.100	Chaetoceros subtilis	87.900
3	137.200	Achnanthes brevipes	59.200
4	147.300	Cyclotella comta	131.300
5	12.500	Skeletonema costatum	5.400
6	57.500	Skeletonema costatum	35.000
7	14.763.300	Skeletonema costatum	13.866.700
8	336.700	Oscillatoria geitleriana	95.800
9	130.800	Oscillatoria geitleriana	55.000
10	92.100	Oscillatoria geitleriana	37.100
11	542.500	Nitzschia closterium	470.000
12	20.800	Oscillatoria acuta	3.300
13	15.400	Oscillatoria subbrevis	3.800
14	12.500	Oscillatoria geitleriana	2.100
15	54.600	Coscinodiscus subtilis	25.000

Ghi chú: Các điểm thu mẫu:

1: Cầu Năm Căn.
2: Cầu Cái Nước.
3: Cầu Tân Đức.
4: Cầu Gành Hào.
5: Cầu Láng Trâm.
6: Cầu Hộ Phòng.
7: Cầu Cái Hưu.
8: Cầu Giây.
9: Cầu Phú Lộc.
10: Cầu Nhu Gia.
11: Cầu Đen.
12: Cầu Ba Rinh.
13: Cầu Nàng Mau.
14: Cầu Rạch Nhum.
15: Cầu Cái Răng.

Appendix 3.11 (Cont.) **Zooplankton species identified at Project Sites of Cantho-Namcan Section 2, April 1999**

Tt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
	I. ROTATORIA															
	Philodinidae															
1.	Rotaria neptunia									1			1			
2.	Philodina roseola				2				1	1		8			2	
	Synchaetidae															
3.	Polyarthra vulgaris									3		1	2	4	1	
	Asplanchnidae															
4.	Asplanchna sieboldi								11	6	4	10	1	1	6	
	Lecanidae															
5.	Lecane (Lecane) luna								5	2			3			
6.	Lecane (Monostyla) bulla				1						1					
	Brachionidae															
7.	Brachionus quadridentatus				48			2	11		32	4				
8.	Brachionus calyciflorus								36	6		2				
9.	Brachionus falcatus								68							
10.	Brachionus urceus				15				9		5					
11.	Brachionus plicatilis				15			2	12			2				
12.	Platyias patulus												2	1		1
13.	Keratella tropica								2							
	Filiniidae															
14.	Filinia longiseta								4							

Appendix 3.11 (Cont.)

Tt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
15.	Tetramastix opoliensis								52	4		1	3			
	II. CLADOCERA															
	Sididae															
16.	Diaphanosoma excisum				1	3			227	5671	128		27	3	3	2
17.	D. leuchtenbergianum								23	11	4					
	Macrothricidae															
18.	Macrothrix triserialis										1		4		2	
19.	Ilyocryptus halyi									12						
	Daphniidae															
20.	Moina dubia								5	37	4		14	1		
21.	Ceriodaphnia laticaudata								29	32			8			
22.	Ceriodaphnia rigaudi								271	528	5		29	5	4	
	Chydoridae															
23.	Chydorus sphaericus										1				1	
24.	Alonella excisa excisa													1		
25.	Kurzia longirostris									1						
26.	Leydigia acanthocercoides									5						
27.	Biapertura karua													2		
	III. COPEPODA															
	Eucalanidae															
28.	Eucalanus subcrassus	2														
	Paracalanidae															
29.	Paracalanus aculeatus	3														
30.	Paracalanus parvus	12			29	2	3	4								

Appendix 3.11 (Cont.)

Tt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
	Pseudodiaptomidae															
31.	Pseudodiaptomus beieri				5	3			3			129	19	60	4	56
32.	Schmackeria bulbosa	46		2	8	4		10	13	32	26	75				
33.	Schmackeria speciosa	174	27	10	34			21								
	Pontellidae															
34.	Labidocera minuta	1														
	Centropagidae															
35.	Centropages gracilis	11														
	Acartiidae															
36.	Acartia pacifica	11	9													
37.	Acartia clausi	82	42	25	141	16	24	36			15					
38.	Acartia erythraea	5														
	Diaptomidae															
39.	Neodiaptomus visnu								4	37					2	
	Oithonidae															
40.	Limnoithona sinensis					1										
41.	Oithona similis	73	76	56	46	29	17	10								
42.	Oithona rigida	32	13	27	17	6	5	4								
43.	Oithona plumifera	12	5		23											
44.	Oithona nana	1														
	Tachidiidae															
45.	Euterpina acutifrons	2	2	2												
	Ectinosomidae															
46.	Microsetella norvegica	4		2	2											

Tt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
	Corycaeidae															
47.	Corycaeus speciosus	2														
	Cyclopidae															
48.	Ectocyclops phaleratus											1			2	
49.	Microcyclops varicans				2				10	211	41	11	18	3	1	2
50.	Mesocyclops leuckarti								38	122	5	3	12		1	
51.	Thermocyclops hyalinus				104	28			1131	5357	373	102	413	52	54	15
	IV. OSTRACODA															
	Cypridae															
52.	Stenocypris derupta			1	1											
53.	Heterocypris anomala									3	1	2	5		2	
	V. MYSIDACEA															
	Mysidae															
54.	Mesopodopsis slabberi		2	1	20	79		1								
	VI. COELENTERATA															
	Thaunantidae															
55.	Obelia sp.	1		1		1		63								
	VII. PROTOCHORDATA															
	Oikopleuridae															
56.	Oikopleura parva	1	1													
	IIX. PROTOZOA															
	Vorticellidae															
57.	Zoothamium arbuscula				9		1								1	
	Arcellidae															
58.	Arcella vulgaris													1	1	1

Tt	Tên loài	Điểm thu mẫu														
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*
	IX. LARVA															
59.	Nauplius copepoda	482	441	174	479	789	203	382	1417	3465	1482	559	863	186	198	426
60.	Zoe	63	10	4	4											
61.	Gastropoda	21	1		4	1	1	6				11	13	216	39	147
62.	Bivalvia	18												4		12
63.	Polychaeta	4		1	2	4		12				7				1
64.	Echinodermata	4	1					3								
65.	Chironomidae														1	
	Số loài	**25**	**13**	**13**	**24**	**14**	**7**	**14**	**23**	**22**	**17**	**17**	**18**	**15**	**19**	**10**
	Số lượng /mẫu	**1067**	**630**	**306**	**1012**	**966**	**254**	**556**	**3382**	**15547**	**2128**	**928**	**1438**	**540**	**325**	**663**
	Số lượng /m^3	**18139**	**10710**	**5202**	**17204**	**16422**	**4318**	**9452**	**57494**	**264299**	**36176**	**15776**	**24446**	**9180**	**5525**	**11271**

Ghi chú:

Vị trí các điểm thu mẫu

1 : cầu Năm Căn
2 : cầu Cái Nước
3 : cầu Tân Đức
4 : cầu Gành Hào
5 : cầu Lang Trâm
6 : cầu Hộ Phòng
7 : cầu Cái Hưu
8 : cầu Giây
9 : cầu Phú Lộc
10 : cầu Nhu Gia
11 : cầu Đen
12 : cầu Ba Rinh
13 : cầu Nàng Mau
14 : cầu Rạch Nhum
15 : cầu Cái Răng.

Appendix 3.11 (Cont.) **Benthic species identified at Project Sites of Cantho-Namcan Section 2, April 1999**

Số TT	TÊN LOÀI	ĐIỂM THU MẪU											
		M1	M2	M3	M4	M5	M8	M9	M11	M12	M13	M14	M15
	A. POLYCHAETA												
	I_ Errantia												
	Nephthydidae												
01	Nephthys polybranchia Southern		6	24	6	1							
	Nereidae												
02	Namalycastis abiuma Muller				1		1		4	6	1		
03	Namalycastis longicirris (Takahasi)								2	1			
04	Lycastis indica Southern	1											
05	Ceratonereis pachychaeta Fauvel	1											
06	Neanthes meggitti Monro											1	
	Lumbrineridae												
07	Lumbrineris heteropoda (Marenzeller)	4											
	Glyceridae												
08	Goniada sp.	1											
	II_ Sedentaria												
	Sabellidae												
09	Bispira polymorpha Johnson	4	2		7								
	Maldanidae												
10	Maldane sarsi Malmgren	9											
	Cirratulidae												
11	Cirratulus sp.							104	26	76			

Appendix 3.11 (Cont.)

Số TT	TÊN LOÀI	ĐIỂM THU MẪU											
		M1	M2	M3	M4	M5	M8	M9	M11	M12	M13	M14	M15
	B. OLIGOCHAETA												
	Tubificidae												
12	Limnodrilus hoffmeisteri Claparèla						10	74	1.572	335	56		
13	Branchiura sowerbyi Beddard								102	96	4		
	Naididae												
14	Branchiodrilus semperi Bourne								4	8			
	C. CRUSTACEA												
	I_ Amphipoda												
	Gammaridae												
15	Melita vietnamica Dang			2									
16	Melita sp.	2	1										
17	Grandidierella lignorum Barnard		1									4	
	II_ Isopoda												
	Corallanidae												
18	Tachaea chinensis Thielemann												1
	III_ Tanaidacea												
	Apseudidae												
19	Apseudes vietnamensis Dang	2											
	IV_ Decapoda												
	Alpheidae												
20	Alpheus sp.		1	1									
	V_ Mysidacea												
	Mysidae												
21	Mesopodopsis slabberi Van Beneden									1			

Số TT	TÊN LOÀI	ĐIỂM THU MẪU											
		M1	M2	M3	M4	M5	M8	M9	M11	M12	M13	M14	M15
	D. MOLLUSCA												
	I_ Gastropoda												
	Fairbankiidae												
22	Fluviocingula elongata Dang						C	C					
	Thiaridae												
23	Thiara scabra (Muller)						C						
24	Sermyla tornatella (Lea)									8		1	
25	Tarebia granifera (Lamarck)						C						
26	Melanoides tuberculatus (Muller)						C	C	C				
	Viviparidae												
27	Bellamya (Filopaludina) filosa (Reeve)							C					
28	Sinotaia sp.							C					
	II_ Bivalvia												
	Corbiculidae												
29	Corbicula blandiana Prime									C			
30	Corbicula tenuis Clessin											C	C
	Amblemidae												
31	Oxynaia sp.									1			
	E_ INSECTA LARVA												
	I_ Trichoptera												
	Hydropsychidae												
32	Hydropsyche sp.						2						

Số TT	TÊN LOÀI	ĐIỂM THU MẪU											
		M1	M2	M3	M4	M5	M8	M9	M11	M12	M13	M14	M15
	F. ECHINODERMATA												
	Ophiuroidea												
	Amphiuridae												
33	Amphioplus laevis (Koehler)	22											
	Số loài	9	5	3	3	1	7	6	7	10	3	4	2
	Số lượng trong mẫu (con)	46	11	27	14	1	13	178	1.710	532	61	6	1
	Số lượng con/m^2	**460**	**110**	**270**	**140**	**10**	**130**	**1.780**	**17.100**	**5.320**	**610**	**60**	**10**

* Chú ý: các mẫu M6, M7, M10 không có động vật đáy.

* **Điểm thu mẫu:**

M1: Cầu Năm Căn.
M2: Cầu Cái Nước.
M3: Cầu Tân Đức.
M4: Cầu Gành Hào.
M5: Cầu Láng Trâm.
M6: Cầu Hộ Phòng.
M7: Cầu Cái Hưu.
M8: Cầu Giây.
M9: Cầu Phú Lộc.
M10: Cầu Nhu Gia.
M11: Cầu Đen.
M12: Cầu Ba Rinh.
M13: Cầu Nàng Mau.
M14: Cầu Rạch Nhum.
M15: Cầu Cái Răng.

Appendix 3.12. PRESENT ENVIRONMENTAL CONDITIONS IN THE MEKONG REGION

1. Northeast Mekong Region

1.1. Location and area

The Northeast Mekong Region (NEMR) includes full territory of Hochiminh City, Dongnai, Binhduong, Binhphuoc, Tayninh and Baria - Vungtau provinces. This zone is located mainly in the Saigon - Dongnai basin. This is a transition area between the Central part of Vietnam and the Mekong Delta (*Figure 2.1 and 3.1*).

The total natural area of the NEMR is 23,521 km^2, occupying 7.2 % of the whole area of the country. The areas 6 provinces in the NEMR are Dongnai, Binhduong, Binhphuoc, Tayninh, Baria-Vungtau and Hochiminh City.

1.2. Topography

Being location between the Central Highland, Central part of Vietnam and the Mekong Delta, the North and Northeast of NEMR are mountains and hills with an elevation of 200 to 500 m. From Northeast to the Southwest and South the land elevation is gradually lowered. The highest areas are found in Phuoclong, Budang districts (Binhphuoc province). Elevation of most of the NEMR is lower than 100 m above the average sea level. The lowest areas occur in the Saigon - Dongnai estuary (Cangio, Nhabe and Binhchanh districts, Hochiminh City), where salinity is strongly intruded. The lowland areas may be also found in some parts of Chauthanh, Nhontrach districts (Dongnai province) and Tanthanh district (Baria-Vungtau province). In the rainy season some small parts of the NEMR are inundated.

1.3. Soils

In the NEMR 8 soil groups are found. The group of yellow-red soils (ferralytic soils) occupies a largest area (1,023,431 ha). This group of soils mainly occurs in the Northern districts of Binhphuoc and Dongnai provinces. Grey soils occupy 400,691 ha, mainly concentrated in Binhduong, Dongnai provinces, and in the Cuchi, Hocmon districts (Hochiminh City). Saline soils occur in the coastal districts (Cangio, Tanthanh disticts and Vungtau town) with an area of 82,196 ha. Acid sulphate soils with an area of 70,649 ha occur mainly in the Western districts of Hochiminh City (Binhchanh, Hocmon and Cuchi) and in some parts of Baria - Vungtau province. Other groups of soils are black tropical soils, alluvial soils, colluvial soils and sandy soils.

1.4. Present landuse

Due to suitability of climate, water resource, topography and soil quality in agricultural production, from the 17th century Vietnamese people had settled in this area and reclaimed the soils for cultivation. Before 20th century the major crop in this area was paddy which grow in alluvial, coalluvial soils. From beginning 20th century, beside paddy the industrial trees such as tea, coffee, rubber have been developed in the high elevation area, where yellow soils occur. In the recent years, cashew tree is widely planted in the high elevation and dry area on the grey soils. In the saline swamps in the coastal area mangrove trees such as *Rhizophora, Avicennia, Sonneratia, Nipa palm* etc. are planted. With the improvement of irrigation system, particularly after construction of the Dautieng reservoir on the Saigon river and Trian

reservoir on the Dongnai river, after 1995 the area of paddy is increased with a major area of double crops per year. In some acid sulphate soils paddy sugar cane and pine apple may be developed. The intensive land reclamation in the zone has created several environmental impacts, such as increase of acidification, soil erosion, water pollution etc.

The NEMR is most developed region in industry of Vietnam. Over 50 industrial parks have been planned in which 30 parks have started to operate. The large ones are Tanthuan, Linhtrung, Hiepphuoc, Tanbinh (Hochiminh), Bienhoa 1, 2, Amata, Godau, Nhontrach (Dongnai), Thuanan (Binhduong) etc.

With the rapid population growth, urbanisation and industrialization during in the recent years the areas of residency and industrial zone are enlarged, particularly along the main rivers and national roads. This tendency is causing various environmental problems in the NEMR such as environmental pollution, degradation of biological resource etc. The information on environmental pollution in Hochiminh City, Dongnai, Binhduong, Tayninh, Binhphuoc and Baria-Vungtau provinces is indicated in various EPC studies in the duration of 1990 – 1999[26-28].

The present landuse in the NEMR is given in *Figure 3.1.*

1.5. Hydrology of the Saigon - Dongnai river system

- **River flow**

The Saigon river, originated from Tayninh province, flows downward and confluences with the Dongnai river at the Southern Catlai (Dendo). The Dongnai river is second big river in the Southern part of Vietnam (after the Mekong) in discharge as well as in length. The Dongnai river, started from the South Central Highlands, confluences with the Langa river before discharge into the Trian reservoir and after the reservoir it receives water from the Be river and flows downward to confluence with the Saigon river, created the Nhabe river. The East and West Vaico rivers may be considered to belong to the basin.

The area and length of the major rivers in the basin are given follows

River	Catchment area (km^2)	Length (km)
Dongnai	14,800	476
Langa	4,200	290
Saigon	4,500	280
Be	7,650	350
East Vaico	6,300	283
West Vaico	6,000	235

From Nhabe, the stream is divided into many branches, discharging into the Ganhrai bay. The major branches are : Soairap, Longtau, Dua, Ngabay and Thivai.

Discharge of the river greatly depends on the rainfall in the basin. The mean annual rainfall in the area is about 1548 mm, which is low in the coastal region (1200 mm) and gradually increased in the North - East region (1600 - 2000 mm).

The patterns of river discharge in the Dongnai - Saigon basin is identified as follow.

- River discharge greatly depends on the rainfall. It is very low in the dry season, particularly in the end of the dry season (March - April), and high in the rainy season, especially in August and September. Therefore, water quality, water pollution in the study is also changed with the change in the river discharge.

- The operation of the Trian and Dautieng reservoirs significantly influences on the river discharge[2]. In the coming decade with the operation of the proposed reservoirs to be constructed on the Dongnai and Be river (Phuochoa, Thacmo, Daininh, Dami, Dongnai 3, 4, 6, 8, Candon, Hamthuan etc.) the characteristics of river flow in the downstream area will be changed.

- At present the average discharge in April of the Dongnai and Saigon rivers are only 28 m^3/s and 17 m^3/s, respectively. In this low flow period self - purification and dilution of the rivers are very low. This will increase river pollution in this period.

- In the coming decades, with the operation of several upstream reservoirs, increased intake of river water and transportation of a part of river flow from the Dongnai river to the Saigon and Vaico rivers as a proposed plan the hydrological regime in the basin will be greatly changed. This will change water quality of the rivers.

- **Tides**

At the sea coast of Hochiminh City and Baria-Vungtau semi - diurnal tide (twice daily) is dominant. The tidal amplitude in the estuarine area is high (2.5 - 4.0 m). Tide may easily enter into the land through several river branches, canals and creeks. Tide influences even to Binhduong (Thudaumot) on the Saigon river and Longbinh on the Dongnai river, particularly in the low flow months.

- **Water quality[28, 29]**

- Salinity

- Salinity intrusion greatly depends on *river discharge*. which varies obviously from under 100 m^3/s (March - April) to over 2000 m^3/s (September - October) at Nhabe after receiving the flows of the Dongnai, and Saigon rivers. Therefore, during the low flow months salinity deeply intrudes into the inland area. Additionally, during the dry season, lasting from November to April, the dominant NE wind with velocity 2 - 5 m/s, sometime over 10 m/s may increase salinity intrusion. A combination of low flow and strong wind causes high salinity intrusion in the dry season.

Due to low flow and location in a low land the Thivai river as well as various rivers in Cangio district (Hochiminh City) are saline in all months around a year.

- Salinity intrusion in the study area depends also on man - made factors, mainly on upstream water resource projects and fresh water intake.

At present, the Trian reservoir with an storage capacity of 2.76 billion m^3 on the Dongnai river are operated. With a water flow regulation of the reservoirs the pattern of salinity intrusion is changed during the low flow period, lasting from January to May the water salinity in all downstream area is significantly reduced in comparison with those before reservoir operation. This creates a favourable condition for water supply for domestic use and irrigation. However, due to the water flow regulation of

the reservoirs during the flooding season, lasting from July to October water salinity in the area of South Cangio district located in the coastal region is higher than those in the period before reservoir operation.

- The change in salinity intrusion regime cause change in the estuarine ecosystem. A large area from Nhabe district get benefits in agriculture and water supply, but the area in the Cangio district get some negative influences on aquaculture and agriculture. This may be one of the reasons, impacting on socio - economic development in the Cangio district.

Considering water salinity of 0.4 ppt or Cl^- 250 mg/l is favourable for human consumption the areas where river water may be intaken for water treatment plants are :

On the Dongnai : from the Dongnai bridge upwards.
On the Saigon : from Benthan upwards.

Due to high salinity in the dry season water of rivers in the basin, including Nhabe, Soairap, Thivai, Longtau and Chodem rivers may not be intaken for domestic uses. It is a major constraints for development of new residential and industrial areas in the downstream part of the basin.

- River acidification

Acid sulphate soils (ASS) occupy a large area in the Plain of Reeds (in the North Eastern part of the Mekong Delta) and in districts of Binhchanh, Hocmon and Cuchi of Hochiminh City. With the increased ASS reclamation acid water from the ASS areas may be transported to the rivers. Most of canals in the districts Binhchanh, Hocmon and Cuchi, connecting with the Saigon river, are acidized by acid water from Longan province. Therefore, the Saigon river has highest acidity, especially, in the beginning months of the rainy season (May - July). pH values of Saigon river at Benthan, Binhphuoc are usually lower than 6.0 . In June, July they may be less than 5.0. In the Thitinh river in Songbe province, connecting with the Saigon river, pH values are also low (5.5 - 5.6). This causes a major constraint for water supply for domestic uses and for fishery. Acidity of other rivers in the study area (the Dongnai, Nhabe, Soairap, Longtau, Thivai, Dinh etc) are not a problem. pH values of these rivers are mainly neutral or slightly alkaline (6.5-8.0) .

- Pollution by organic matters

With a very poor wastewater treatment facilities, the rivers Saigon, Dongnai, Thivai, Dinh, particularly canals in the Southern Focal Economic Zone and others water bodies daily receive over seven hundreds thousand m^3 untreated domestic and industrial waste water from houses, hotels, restaurants and factories, located on the banks. The major pollutants in domestic and food processing waste water are organic matters, nutrients (N, P) grease and oils and bacteria .

Organic pollution is determined by the parameters DO and BOD. In the Saigon river DO concentrations are highest in Benthan upwards and Nhabe downwards (5.5-6.5 mg/l). In the central area from Binhphuoc to Tanthuan where receive wastewater from urban area DO in the Saigon river are only 1.5 - 3.5 mg/l. Sometime in the low flow period they are less than 1.5 mg/l; BOD is 15 - 20 mg/l. This may cause damage to some aquatic animal species.

BOD concentration in the Saigon river are usually < 10 mg/l at Benthan to upstream. In the urban area, it is high as 20-30 mg/l. In the low flow months they are even over 30 mg/l (at the Nharong port). It means the Saigon river is heavily polluted by organic matters.

Organic pollution of the Dongnai river is still low but already significant. In the Trian reservoir DO and BOD values often 6.0 - 7.0 mg/l and 2 - 5 mg/l, respectively. At Hoa'an DO and BOD values often 6.0 - 6.5 mg/l and 4-8 mg/l, respectively. Therefore, this river is much cleaner than the Saigon river. The Dongnai river (from Hoaan upwards) now still meets the requirement for water sources for intake into water treatment plants, fishery and recreation.

With the high self-purification of the rivers in the estuary region (after confluence of the Saigon and Dongnai rivers), organic pollution in the area is less than that in the urban area but the reduction rate is not high. In the rivers in Cangio district DO and BOD values, usually vary in range of 4.0 - 6.0 mg/l and 5.0 - 10.0 mg/l, respectively.

Organic pollution is very serious in the canals in the urban area of Hochiminh City, where BOD values are usually 30 - 100 mg/l.

- Nutrient pollution

With high N- and P- loads untreated domestic waste water gives nutrient pollution for canals. From the canals, the rivers may be impacted by nutrients. The N and P concentrations in the Saigon river at the urban area are usually higher than 0.5 mg/l and 0.10 mg/l, respectively. In the estuary area they are considerably reduced : the N and P concentration in the Thivai river at various stations are about 0.10 - 0.25 mg/l and 0.01 - 0.05 mg/l, respectively in Cangio district 0.3 - 0.5 mg/l and 0.02 - 0.10 mg/l, respectively. While, due to location in dense population area organic and nutrient pollution of the Dinh river in Baria town is high as the Saigon river.

Nutrient pollution is heavy in the canals, where eutrophication may easily be created.

- Bacteriological contamination

Due to receiving of untreated domestic waste water the rivers in Hochiminh City, Bienhoa City, Vungtau City, Thudaumot town and Baria town are significantly polluted by bacteria.

During the low flow months (December - April) the concentrations of *E. Coli* at Nharong are $1\text{-}10.10^4$ MPN/100 ml. It is $5\text{-}10.10^3$ MPN/100 ml at Thudaumot and Binhphuoc (the Saigon river) and $1 - 2.10^3$ MPN/100 ml at Hoa'an. This means that the Saigon river water quality does not meet various guidelines for raw water intaken for water treatment plant, E. Coli in which usually should not be higher than 2.10^3 MPN/100 ml. In the rainy season, bacteriological pollution is even higher than that *Bacteriological, organic and oils contaminations may be considered as the major pollution problems of the rivers in Hochiminh City and Baria - Vungtau province.*

- River water pollution by toxic chemicals

The toxic chemicals such as heavy metals (Pb, Cu, Hg, Cr, Ni, As ...), mineral oils from untreated industrial wastes and pesticides from treated rice fields occur in the rivers. However, so far according to the data of the monitoring network the concentration of these toxic chemical in the major river are still lower than the guidelines of WHO and Vietnam for domestic used water. With high sedimentation,

water in the estuary area has very low concentrations of heavy metals and pesticides. However, the content of heavy metals in river sediment at the study area is rather high. According to a study of EPC in 1995 the contents of chromium, mercury, lead and arsenic in sedimentation from the Thivai river are considerable.

Oil contamination is serious in some places, particularly in the Saigon, Tancang harbour areas and in the cases of oil spill risks, which several times have happened in the Nhabe and Cangio districts.

2. Climate

Based on the collected multi-year data from these stations the following meteorological characteristics in the NEMR are identified.

- Radiation

The average sunlight hour varies from 180 hours in June to 301 hours in March. In the rainy season, lasting from May to October the average sunlight hour is 180 hours in June and 245 hour in May. In months of the dry season, lasting from November to April it reaches from 235 to 301 hours in March. The minimum sunlight hour is 147 hours in July. The total annually sunlight hours is 2913 hours and minimum is 2716 hours. In March the number of sunlight hours is highest and it is lowest in July.

In Hochiminh City and Bienhoa City the highest radiation is found in March and April (428 - 542 cal/cm^2) and the lowest one - in November (324 - 432 cal/cm^2).

- Atmospheric temperature

- Maximum atmospheric temperature

In Vungtau the maximum annual atmospheric temperature is 34.7°C. The variation of the maximum annual atmospheric temperature is rather small (from 31.9°C in January to 34.7°C in May) in a variation of 2.8°C. In Hochiminh City (Tansonnhat station) and Bienhoa the average monthly temperature is highest in April (28.7 - 28.9 ^{0}C) and lowest in December (25.2 - 25.7 ^{0}C).

- Minimum atmospheric temperature

The minimum annual atmospheric temperature varies from 18.8°C in January to 22.3°C in April.

- Average atmospheric temperature

The average annual temperature is 27.1°C.

The variation of the monthly average air temperature is from 25.2°C in January to 28.8°C in May, in a variation of 3.6°C.

Generally, the range of variation of the average, maximum and minimum atmospheric temperature is not wide. The difference between hot and cool seasons is small and is characterized the mild climate in the study area.

- Atmostpheric humidity

- *Absolute atmospheric humidity*

The annually absolute atmospheric humidity is 28.1 mb. The absolute air humidity is lowest at 24.2 mb in December and highest at 30.7 mb in May.

- Relative atmospheric humidity

In the region, the average annual atmospheric humidity is 79%. It is lowest at 71% in February March (66.6 - 71.1 %) and highest at 87% in September and October.

- Atmospheric pressure

The annually average atmospheric pressure at the Vungtau station is 1009.2 mb, yearly maximum is 1019.0 mb and yearly minimum 1001.4 mb. In the rainy season, there are values of low pressure due to tropical low pressure on the area of the Southern China Sea.

- Evaporation

The monthly evaporation is rather high in months of the dry season (above 130 mm). It is lowest in months of the rainy season (under 50 mm).

- Wind regime

- Average wind speed

In the dry season the North and Northeast winds are dominant. Wind speed in this season varies from 2.5 to 3.2 m/s (in Bienhoa and Tansonnhat).

In the rainy season the main wind directions are Southwest and West. In this season the monthly average wind speed varies from 2.2 to 3.3 m/s. In Vungtau, wind speed is significantly higher than this is in Tansonnhat.

- Maximum wind speed

In Vungtau, the observed maximum wind speed is 15 to 18 m/s. The wind speed is maximum in cases effect of storm.

- Rainfall

- Total annual rainfall and seasonal distribution

The distribution of the seasonal average rainfall in Vungtau in the dry season (November to April) is 160-170 mm and in the rainy season (May to October) 1500 mm. At Vungtau, in the dry season the total rainfall was only 11.0% the total annual rainfall.

- Monthly rainfall

At Vungtau, the monthly average rainfall varied in a wide range, from 1mm in January to 287 mm in July. The rainfall of July occupied 21% of the whole average rainfall in year. The average rainfalls in months in the period May - October were all $\geq$ 199 mm, while those in the dry season were all lower than 20 mm.

At Tansonnhat and Bienhoa rainfall is higher than that at Vungtau.

- Special phenomena of weather and tropical storm

- Number of windy days

The number of windy days in the whole year is 78 days. In the rainy season, the monthly numbers of windy days are all bigger than 10, especially in May it is 25 days and in July it is 18 days.

- Number of misty days

The number of misty days at the Vungtau station is 84 days in a year. The high numbers of misty days occur in the dry season and at the end of the rainy season (from October to March).

- Tropical storms

According to data recorded from 1929 to 1990, there were 40 storms appearing in the South China Sea in the region from Camranh to the Camau cap. There were 6 storms passing by Vungtau in this space of time. The maximum velocity measured within 60 years is 30 m/s. The wind velocity higher than 20 m/s has been observed 4 times. Generally, storm rarely appears in Vungtau - Dongnai - Saigon basin area and its intensity can be evaluated as weak or medium.

3. Air quality

- **Dust pollution**

- Dust pollution in Hochiminh City

According to the data of the Hochiminh City Monitoring system in the dry season the dust concentration is 0.4-2.0 mg/m^3 (according to the Vietnamese Standard for residential area permissible dust concentration is 0.3 mg/m^3). It reduced to 0.3-1.0 mg/m^3 in the rainy season. At some National roads, dust pollution is serious.

- Dust pollution at in Binhduong province

In the dry season the average dust concentration in urban area (Thudaumot town and Thuanan district) 0.5-0.8 mg/m^3 which is higher than the Vietnam standard (TCVN 5937-1995).

In the rainy season dust pollution is significantly reduced: the average dust concentration at the areas along the National roads in Thudaumot, Tanuyen, Bencat and Thuanan were 0.52; 0.43; 0.42 and 0.41 mg/m^3, respectively.

- Dust pollution at Vungtau city

The average dust (total particulate matter) concentration of the area along the road N51 is from 0.30 mg/m^3 to 1.0 mg/m^3. In comparison with the Vietnam air quality standards for residential area (0.3 mg/m^3 1h - average), it is concluded that the areas located nearby the National road in Vungtau city is evidently polluted by dust. The main pollution source is low quality roads and construction.

- **Pollution due to sulfur dioxide(SO_2)**

- In Hochiminh City

According to monitoring system of Hochiminh City from 1994 to 1998, SO_2 concentration vary from 0.05-0.2 mg/m^3 which is always lower than the Vietnam air quality standard (0.5 mg/m^3). SO_2 pollution may occur only at the places near by main roads in the peak hours.

- In Binhduong province

From the EPC's monitoring data in March, July and November at 30 monitoring station in urban area SO_2 concentrations were only 0.05 - 0.12 mg/m^3. This shows that at present SO_2 pollution is not a problem in Binhduong province.

- In Vungtau city

Recorded data indicated that the average concentration of SO_2 at Vungtau city is from 0.09 mg/m^3 to 0.26 mg/m^3.

- **Pollution by nitrogen oxide (NO_x)**

- In Hochiminh City

NO_2 concentration at the monitoring stations in Hochiminh City in the dry season were <0.10 mg/m^3. It was<0.07 mg/m^3 in the rainy season. This means that so far no NO_2 pollution in a large area of Hochiminh City. It occurs mainly along the main roads in the peak hours.

- In Binhduong province

NO_2 concentrations recorded were 0.02 - 0.04 mg/m^3. This means that NO_2 pollution in Binhduong is still very slight.

- In Vungtau city

Recorded data in 12 air quality monitoring stations indicated that the average concentration of NO_x at Vungtau is from 0.020 mg/m^3 to 0,068 mg/m^3. The regionally average NO_x concentration is 0.039 mg/m^3, which is much lower than the standard.

- **Total volatile organic matters, lead pollution and other specific pollution**

The average total hydrocarbon (THC) concentration at Vungtau city is 2.0-3.0 mg/m^3.

All times of examination indicated that the concentration of volatile THC, lead in Vungtau all meet the Vietnam air quality standards (TCVN 5937-1995).

Lead pollution in Hochiminh City, Binhduong, Tayninh and Dongnai provinces is still slight.

Radioactive materials in the air in Hochiminh city are still low. At present, it is not problem of air pollution caused by radioactives in the NEMR.

- **Conclusion on air quality**

At present in the NEMR the major air pollutant is particulate matter, dust caused by transportation and industrial activities. The air in the zone is not evidently polluted by SO_2, NO_x, CO, THC and radioactive materials, concentration of these pollutants are lower than the Vietnam standard for Ambient Air (TCVN 5937-1995).

4. Biological resources in the NEMR

Detail information on biological resource in this region is shown in various papers[26-29], the main features are summarized below.

- **Aquatic biological resource in the freshwater area**

In the freshwater area of the NEMR, including the whole territory of Binhduong, Binhphuoc, Tayninh, Dongnai provinces and Northern districts of Hochiminh City and Northern districts of Baria - Vungtau province, there are several studies on aquatic biological resources implemented by Sub-IEBR, ACRI-2 and EPC in the period 1985 - 1998.

- Phytoplanktons

Over 100 phytoplanktons species have been identified in the Dongnai, Saigon, Songbe rivers. The dominant phytes are *Bacillariophyta* (62 species), *Chlorophyta* (44 species), *Cyanophyta* (15 species), *Euglenophyta* (5 species) and *Pyrrophyta* (2 species). However, the phytoplankton composition varies from month to month.

- Zooplanktons

In the Saigon, Dongnai and Thitinh rivers over 50 zooplanktons species have been identified. They belong to freshwater species. Zooplankton quantity is low (usually < 300 individuals/m^3.

- Benthic animals

In Dongnai river at the Trian area over 20 benthic animal species have been recorded in 1995-1995. Their composition greatly varies depending on locations and seasons.

- Fish

17 species having economic value in the fresh water area have been identified. The most economic important are *Ophicephalidae (O.micropeltis, O.stricotus)*, *Anabantidae (Osphoroneumus gorami, Anabas testudineus...)*, *Cypronidae (Pyntices javanicus)*, *Clariidae (Clarias batrachus)* etc.

- **Terrestrial ecosystems**

Nowadays a large forest area of the NEMR has been exploited for agriculture, rubber plantation, aquaculture and settlement. A part of the forest area had been destroyed by the US herbicide spraying operation (1961 - 1973). According to the report of MOSTE the loss in forest area in the Northeast Mekong region is as follows. (in thousand ha).

	1943	1973	1985	1994
Hochiminh City	-	35	39	25
Baria - Vungtau	119	93	27	32
Binhduong+Binhphuoc	610	536	226	100
Dongnai	378	318	247	80
Total	1,107	982	500	237

Nowadays, in the zone only an area of about 238,000 ha of forest (32,300 ha in Baria - Vungtau and 25,200 ha in Hochiminh City (Cangio district), 100,000 ha in Binhphuoc province and 80,000 ha in Dongnai province still occur. Most of the forest area is covered by secondary forests, only a small area (about 50,000 ha) in Xuyenmoc (Baria - Vungtau province) Bugiamap (Binhphuoc) and Nam Cattien (Dongnai) are natural primary forest.

About 700 vegetation species and 200 animal species are found in the study area.

There are three types of natural ecosystems in the study area.

- Evergreen tropical rain forest
- Mangrove forest
- Inland swamp

- **Evergreen tropical rain forest (inland forest)**

In the hill and high elevation area in Binhlong, Budang districts (Binhphuoc province), Tanphu district (Dongnai province) and Xuyenmoc district (Baria - Vungtau province) an area of over 200,000 ha of evergreen tropical rain forest occurs.

The tropical rain forest is rich in biomass and abundant in biodiversity. In the evergreen forest in Binhchau (Xuyenmoc) the major wood trees which have economic value are *Dipterocarpus (D.alatus, D.diari); Uphorbiaceae, papilionaceae; Leguminoceae (legerstroenia thorelii); Dalbergia barienis, Pahudia Cochinchinensis, Pterocapus pedatus, Shoria vulgaris, Shorea Cochinchinensis, Irvingia oliveri, Dipterocarpus tuberculatus, D.intricatus, D.obtusifolius* etc. Biomass of this forest is low (< 150 m^3/ha).

In mixed deciduous forests in Dongnai an Binhphuoc provinces the most popular vegetation families are *Diterocarpus spp., Hopea odorata, Shorea guiso, Fabaceae spp., Anlesoptera spp.,* etc. In some forests the biomass is high, which is normally over 200 m^3/ha.

Vegetation diversity in the inland forest is very abundant. The National Research Project KT.02.15 have identified 648 species in the Trian - Mada forest.

- **Inland swamp vegetation**

Inland swamp forest occupies only a small area on temporarily inundated acid sulphate soils in Binhchau, Xuyenmoc districts (Baria - Vungtau province).

The major vegetation species in this area is reeds : *Terminalia procora, Eleocharis dulcis, Sacciolepsis myuros, Leptochloa chinensis, Echiochloa crusgalli, Cyperus spp.* In this area in the recent years *Eucaliptus, Annona glabra, Melaleuca leucadendra* etc. are planted.

In the recent years, with the increased urbanization and industrialization the inland swamps area is reduced. Now, It is may be found only in Xuyenmoc, Chauduc districts and Condao island.

- **Mangrove forest**

Three decades ago mangrove forest covered all area of Cangio district and a large part in the western site of the National Road N51. During the war, 2/3 of the mangrove forest area was destroyed by the American herbicide spraying operations. After the liberation (from 1975) Hochiminh City has set up a reforestation programme. At present, mangrove forest area is increased to 25,200 ha in Cangio district. This is largest and richest mangrove forest in Vietnam. However, a part of the mangrove forest in Tanthanh district, Baria town and Vungtau City was damaged, due to increase of shrimp culture and in Baria - Vungtau province.

- Vegetation in the mangrove area

There are 32 mangrove species growing in the mangrove forest. There are *Phoenix paludosa, Rhizophora apiculata, Avicennia marina, Sonneratia, Bruguiera gymnorrihiza, Acgiceras spp., Ceriops spp.,* etc. withstand high salinity or frequently submerged conditions, in the areas affected by salinity intrusion at high tides.

The mangrove vegetation, growing in the study area are different from place to place. Mangrove trees, well growing in Cangio, are *Rhizophora apiculata,* which has been planted since 1975. In Baria - Vungtau, forest are in normal growing situation with retarded and long lifetime trees non-uniformed mixture of *Phoenix paludosi* forest and/or *Avicennia, Sonneratia,* etc. *Phoenix paludosi* forest spreads over to the Caimep river mouth and intermixes with *Sonneratia* forest in the coastal area of the Vungtau peninsula.

- **Wild animals in the Southern Economic Focal Zone**

- Wind animals in the mangrove forest

- Birds

The increase of the mangrove forest area in recent years, in Cangio district has attracted returning of water birds. There are a number of species of birds that stay in flocks and search for foods in tidal areas on the Thivai and Gogia rivers. There are 36 species of were identified in the study area.

- Wild mammals

In the mangrove forests in the study area 11 species of mammals as wild pigs (*Sus crofa), Sciurus rodolphi,* wild cat (*Felis chaus),* rabbits, otters (*Lutra lutra),* monkeys etc. were identified in the recent years. They mostly concentrate in hilly areas in the mangrove forest and shelter under canopy of branches of *Phoenix paludosi* and *Acrostichum aureum.* Many herd of wild pigs appear and proliferate in the *Rhizophora* forest.

- Reptiles and amphibians

There are 8 species of reptiles and amphibians that are easily found in many places. A large number of species of *Rana Tigrina* and other 3 species with high level of distribution are domestic toads, frogs, marsh frogs.

- Wild animal in the tropical mixed decidous forest

According to study of the National project KT.02.15 in the inland forest area 144 bird species, 41 mammal species, 31 reptiles, 17 fish species having economic value; 100 insect species have been recorded in 1993-1994 14 wild animal species may be considered as rare and endangered ones. They are *Arctictis binturong, Elephas maximums, Felis temminski, Maccaca nemestrina, Nycticebus coucang, N.pugmaues, presbytis francoisi, Pygathris nemaeus, Tragulus javanicus; Arborophila davidi, lophura nycthemera, polylectron germaini* (birds); *python reticulatus and P.molurus* (reptiles).

- **Conservative forests (forest reserves)**

In the NEMR the following forest areas have been approved by the Government to be protected.

- Nam Cattien forest including Catloc and buffer zone occupying over 10,000 ha in Dongnai-Lamdong provinces. This natural forest is rich in biodiversity, particularly vegetation and wild animals. Nowaday Nam Cattien has been approved to be a National Park.

- Bugiamap forest occupying 22,330 ha in Binhphuoc province is rich in ecosystems and wild animals.

- Binhchau-Xuyenmoc forest occupying over 15,000 ha is rich in wild animals and good area for ecotourism.

Location of these protected forests is shown in Figure 3.1.

Besides the above mentioned specific forests to be reserved for biodiversity conservation, the following forests should be protected for improvement of the environmental conditions and economic development.

- Tropical rain forests in the upstream of the Dongnai, Langa basin to protect the Trian and other reservoirs.

- Mangrove forests in Cangio district of Hochiminh City to protect aquatic resources to clean up polluted rives and to prevent air pollution.

Therefore it is necessary to recomment that in the NEMR planning these forests areas should be rehabilitated. All transport industry, urbanization and habour construction project should be located outsite the planned conservative and protected forest areas.

All road sections belong to HRP3 are not located in the protected areas (Figure 3.2).

Appendix 4.1

COMPENSATION COST ESTIMATE

Section: Km 2068 + 140 - Km 2107 + 742 (Can Tho Province)

No	Item	Unit	Quantity	Rate (10^3 VND)	Residual Value Ratio (%)	Amount (10^6 VND)
1	Urban land - Class I on Hai Thang Ba Boulevard of Can Tho City	m^2	2.500	2.600.00		6.500.00
2	Urban land - Class I along NH1 in Cai Rang Town of Chau Thanh Distnct	m^2	4.000	1.200.00		4.800.00
3	Urban land - Class I along NH1 in Phung Hiep town	m^2	2.400	1.000.00		2.400.00
4	Faming land - Class I	m^2	3.000	11.58		34.74
5	House - Class III	m^2	640	965.80	80	494.49
6	House - Class IV	m^2	3.800	821.10	70	2.184.13
7	Primary school	m^2	200	699.10	80	111.86
8	Brick yard	m^2	240	100.00	80	19.20
9	10 KV Transmission line	m^2	1.300	100.00	70	91.00
10	Rice field	m^2	3.000	0.80		2.40
11	Subsidy	Household	258	3.000.00		774.00
	Total					17.411.82

(Says: Seventeen billion four hundred and twelve million Vietnamese Dong)

Note: * *Land rates are applied pursuant to Decision No. 1279/1998 - QD - UBT dated June 5, 1998 issued by The People's Committee of Can Tho Province.*
* *House rates are applied pursuant to Decision No. 139/QD - UBT - 97 dated December 13, 1998 issued by the People's Committee of Soc Trang Province.*

Appendix 4.2

COMPENSATION COST ESTIMATE

Section: Km 2107 + 742 - Km 2196 + 300 (Soc Trang Province)

No	Item	Unit	Quantity	Rate (10^3 VND)	Residual Value Ratio (%)	Amount (10^6 VND)
1	Faming land - Class I	m^2	12,300	5.50		67.65
2	House - Class III	m^2	1,152	965.80	80	890.08
3	House - Class IV	m^2	320	821.10	70	183.93
4	House - Class V	m^2	200	401.00	70	56.14
5	Rice field	m^2	11,800	0.65		7.67
6	10 KV Transmission line	m	3,300	100.00	70	231.00
7	Banana	Tree	1,500	12.00		18.00
8	Coconut	Tree	10	100.00		1.00
9	Subsidy	Household	48	3,000.00		144.00
	Total					1,599.47

(Says: One billion five hundred and ninety nine million Vietnamese Dong)

Note:

** Land rates are applied pursuant to Decision No. 73/ QD - UBT - 95 dated March 27, 1995 issued by The People's Committee of Soc Trang Province with the adjusted coefficient of K = 5 to suit the existing rate.*

** House rates are applied pursuant to Decision No. 139/QD - UBT - 97 dated December 13, 1998 issued by the People's Committee of Soc Trang Province.*

Appendix 4.3

COMPENSATION COST ESTIMATE

Section: Km 2196 + 300 - Km 2231(Bac Lieu Province)

No	Item	Unit	Quantity	Rate (10^3 VND)	Residual Value Ratio (%)	Amount (10^6 VND)
1	Pond	m^2	200	3.50		7.00
2	House - Class II	m^2	260	1,200.00	80	249.60
3	House - Class III	m^2	600	800.00	70	336.00
4	House - Class IV	m^2	560	560.00	70	219.50
5	House - Class V	m^2	200	330.00	70	46.20
6	Temporary House	m^2	1,650	100.00	70	115.50
7	Brick wall	m^2	200	100.00	70	14.00
8	Brick tomb	Unit	20	1,500.00		30.00
9	10 KV Transmission Line	m2	500	100.00	70	35.00
10	Subsidy	Household	82	1,500.00		123.00
11	Subsidy	Household	79	3,000.00		237.00
	Total					1,412.80

(Says: One billion four hundred and thirteen million Vietnamese Dong)

Note: * *Land rates are applied pursuant to Decision No. 54/QD - UB dated September 27, 1997 issued by The People's Committee of Bac Lieu Province.*

* *House rates are applied pursuant to Announcement No. 13/TBS - 1998 dated August 01, 1998 issued by inter - department of Finance - price, Construction and Cadastral of Bac Lieu Province.*

Appendix 4.4

COMPENSATION COST ESTIMATE

Section: Km 2231 - Km 2300 + 496 (Ca Mau Province)

No	Item	Unit	Quantity	Rate (10^3 VND)	Residual Value Ratio (%)	Amount (10^6 VND)
1	Urban land - Class I	m^2	2,400	960.00		3,716.80
2	House - Class II	m^2	800	1,200.00	80	768.00
3	House - Class III	m^2	600	800.00	70	336.00
4	House - Class IV	m^2	800	560.00	70	313.60
5	House - Class V	m^2	600	330.00	70	138.60
6	Subsidy	Household	120	3,000.00		360.00
	Total					5,633.00

(Says: Five billion six hundred and thirty three million Vietnamese Dong)

Note: * *Land rates are applied pursuant to Decision No. 214 QD/ UB dated October 25, 1994 issued by The People's Committee of Minh Hai Province.*
* *House rates are applied pursuant to Announcement No. 13/TBS - 1998 dated August 01, 1998 issued by inter - department of Finance - price, Construction and Cadastral of Bac Lieu Province.*

Appendix 4.5

COMPENSATION COST ESTIMATE FOR HRP3

No	Section	Amount (10^6 VND)
1	Km 2068 + 140 - Km 2107 + 742	17.412
2	Km 2107 + 742 - Km 2196 + 300	1.599
3	Km 2196 + 300 - Km 2231	1.413
4	Km 2231 - Km 2300 + 490	5.633
	Total	26.057

(Says: Twenty six billion and fifty seven million Vietnamese Dong)

Appendix 4.6

Guideline values for combined exposure to sulfur dioxide and particulate matter[a]

	Averaging time	Sulfur dioxide	Reflectance assessment: black smoke[b]	Gravimetic assessment	
				Total suspended particulates (TSP)[c]	Thoracic particles (TP)[d]
		($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
Short term	24 hours	125	125	120[e]	70[e]
Long term	1 year	50	50	—	—

[a] No direct comparisons can be made between values for particulate matter in the right- and left-hand sections of this table, since both the health indicators and the measurement methods differ. While numerically TSP/TP values are generally greater than those of black smoke, there is no consistent relationship between them, the ratio of one to the other varying widely from time to time and place to place, depending on the nature of the sources.

[b] Nominal $\mu g/m^3$ units, assessed by reflectance. Application of the black smoke value is recommended only in areas where coal smoke from domestic fires is the dominant component of the particulates. It does not necessarily apply where diesel smoke is an important contributor.

[c] TSP measurement by high volume sampler, without any size selection.

[d] TP equivalent values as for a sampler with ISO TP characteristics (having 50% cut-off point at 10μm), estimated from TSP values using site-specific TSP/ISO TP ratios.

[e] Values to be regarded as tentative at this stage, being based on a single study (involving sulfur dioxide exposure also).

SUMMARY OF THE GUIDELINES

Appendix 4.7

Table 8. Guideline values for individual substances based on effects on terrestrial vegetation

Substance	Guideline value	Averaging time	Remarks
Nitrogen dioxide	95 $\mu g/m^3$ 30 $\mu g/m^3$	4 hours 1 year	In the presence of SO_2 and O_3 levels which are not higher than 30 $\mu g/m^3$ (arithmetic annual average) and 60 $\mu g/m^3$ (average during growing season) respectively
Total nitrogen deposition	3 g/m^2	1 year	Sensitive ecosystems are endangered above this level
Sulfur dioxide	30 $\mu g/m^3$ 100 $\mu g/m^3$	1 year 24 hours	Insufficient protection in the case of extreme climatic and topographic conditions
Ozone	200 $\mu g/m^3$ 65 $\mu g/m^3$ 60 $\mu g/m^3$	1 hour 24 hours averaged over growing season	
Peroxyacetylnitrate	300 $\mu g/m^3$ 80 $\mu g/m^3$	1 hour 8 hours	

SUMMARY OF THE GUIDELINES

Appendix 5.1

INSTITUTE OF TROPICAL TECHNOLOGY & ENVIRONMENTAL PROTECTION
ENVIRONMENTAL PROTECTION CENTER
ENVIRONMENTAL ECONOMICS FACULTY – ECONOMICS UNIVERSITY IN HCM CITY

***

SURVEY AND CHECK-UP THE IMPLEMENTATION OF REMOVAL AND REHABILITATION PLAN OF TRANS-ASIA LINE PROJECT IN VIETNAM

SITUATION OF COMPENSATION FOR HOUSEHOLDS IN PROJECT SITE

Province.....District .....Commune ..... Household code: ☐ ☐ ☐ ☐

Name of surveyed person: .....

Q1. Age of the head of the household: ☐ ☐ .
Q2. Main religion of the household:.....

Q3. Number of people in the household: ☐ ☐ Female: ☐

Q4: Total main laborer(s) ☐ ☐ Female: ☐

Q5. Main and auxiliary job of member(s) at working age in the household

Working member	Job			
	Main job	Working place	Auxiliary job	Working place
1				
2				
3				
4				

Working place: a. at presently residing commune and town b. elsewhere
Main job is the job earning the major part of income in a year

Q6. Level of education of members, calculated from schooling age upwards

Level of education	Number of family member(s)
Primary school	
Junior secondary school	
Senior secondary school	
College	
University and higher level	

Q7. How long has the household resided here? Year☐☐☐☐

Q8. What are the distances from the house to the following places? (km)

a. Primary school ☐ b. Market ☐ c. Hospital ☐

d. Post office ☐ e. Main working place ☐

Q9. The area of the land located in the site of clearance (m^2) ☐☐☐☐

Q10. The area of the land to be removed (exclusive of housing area)(m^2) ☐☐☐☐

Q11. The housing area to be removed (warehouse, area of production, etc.) (m^2)☐☐☐☐

Q12. For what do you currently use the land to be removed for?
a. Residence b. Agricultural production c. Another

Q13. Do you legally own the land and house to be removed?
a. Yes b. No

Q14. According to you, is the measurement of the area to be removed satisfactory and accurate as your calculation? (do write down detailed opinion of the household?
a. Satisfactory b. Ordinary c. Unsatisfactory
.....

Q15. Does the household intend to move to the resettlement site?
a. Yes b. No

Q16. The sum that the government proposed to compensate

Item	Land	House	Crops	Tomb(s)	Other
PPU of compensation					
Market PPU					
Total compensation					

Note: PPU = price per unit

Q17. The compensation you have received so far:

Total proposed compensation: .....
Received total: .....
Date:..... Voucher: .....

Q18. In condition you have not received, please let us know why.
a. The compensation rate is not satisfactory
b. The Site Clearance Commission has not informed
c. It has not been the proposed time
d. The household has not found out a new residential place
e. My neighbors have not received, so do I
f. Other reasons (in details)

Q19. If considering the compensation rate unsatisfactory, please let us know why.
a.. PPU of land is low
b. PPU of house is low
c. PPU of crops is low
d. Other reasons .....

Q20. Your aspiration about the mode of removal and compensation? (in details)
a. Receiving compensation at one
b. Compensation at market price
c. Quick and simple procedures
d. Other
.....
.....

Q21. What do you intend to do with the compensation?
a. Investing in production in the remaining area
b. Repairing the remaining part of the house
c. Buying a house in the resettlement site
d. Buying a house elsewhere
e. Adding in the spending of the family
f. Other .....

Q22. Do you clearly know about the policy of removal and compensation for the project of Trans-Asia line crossing your land?
0. No 1. Yes

Q23. Have you faced any difficulties working with the Site Clearance Commission?
.....
.....

SURVEYOR. DATE.TIME .....
INSPECTOR. DATE.TIME .....