5. Resort Island Questionnaire Survey

5. RESORT ISLANDS QUESTIONNAIRE SURVEY

5.1 Resort Island Questionnaire Survey

5.1.1 Purpose

The survey was carried out primarily for the intention to confirm the name of the resort islands disposing wastes at the Thilafushi and added the questions to obtain the current operation condition of SWM by the resort islands.

5.1.2 Survey Period

The questionnaire was distributed to 74 resort island in early July and collected the replies by the end of July, 1998.

5.1.3 Procedures of Survey

The questionnaires prepared by the Study Team was sent to 74 resort islands through the channel and co-operation of the Ministry of Tourism. The replies were sent back to the Ministry of Tourism and transferred to the Study Team through Ministry of Construction and Public Works. Finally, 45 resort islands replied to the questionnaires.

Result of the Questionaire Survey to the Resort Islands

Survey Period : July 1998

(Sheet No.: 1/4)

No.	Name of Resort Island	Location (Attol)	Disposal Site	Frequency of Transport. (times / month)	Actual Records January - June, 1998 (times)	Means of Transport. (Barge or Dhoni)	Ownership of the Barge or Dhoni	Transport. and Unload. Cost per Trip (Rfs)	Annual Transport. Cost (Rfs/year)	Annual Hotel Guest in 1997 (bed -nights / year)	Nos. of Staff in Season (person)	Nos. of Staff in Off-season (person)	Nos of Hotel Rooms
1	Paradise Island	Male' Atoll	Thilafushi	2 to 3	13	Dhoni	Villa Shipping and Trading Pvt. Ltd.,	3,000	14,400	178,621	590	590	260
2	Kandooma Tourist Resort	Male' Atoll	Kandooma	N/A	N/A	N/A	N/A	N/A	N/A	37,312	105	99	81
3	Fesdu Fun Island	Ari Atoll	Thilafushi	3	15	Supply Dhoni	Fesdu / Universal	1,673	94,228	37,597	110	110	55
4	Twin Island Maafushivaru	Ari Atoll	Maafushivaru Resort	1 to 2	10 timees upto june 30	Dhoni	Twin Island Maafushivaru	1,200	120,000	NA	70	60	38
5	Kuramathi Tourist island	Ari Atoll (North)	Thilafushi	1	5	Barge	Universal Enterprises Pvt.Ltd.,	2,600	260,000	163,715	550	550	274
6	Laguna Beach Resort	Male' Atoll	Thilafushi	4	24	Dhoni / Barge	own	2,600	176,000	72,025	298	298	129
7	Nakachafushi Tourist Resort	North Male' Atoll	Thilafushi	3 times a week	72	Dhoni	Nakachafushi Tourist resort	1,000	96,200	3,225	147	147	51
8	Baros H. Resort	Male' Atoll	Thilafushi	15	102	Dhoni	Universal Enterprises Pvt. Ltd.,	1,000	98,200	115,922	180	170	75
9	Fullmoon Beach Resort	Male' Atoll	Thilafushi	Daily		Barge once a week / Daily waste by Dhoni	Universal Enterprises Pvt. Ltd.,	3,000	180,900	95,652	475	475	150
10	Kuruba Village Tourist Resot	Male' Atoll	Thilafushi	7 days a week		Large open Dhoni and Barge	Universal Enterprises pvt. Ltd.,	3,000	180,000	105,822	513	513	170
11	Taj Corel Reef Resort HEMBADHOO	Male' Atoll	Thilafushi	12	72	Dhoni	Hire	750	108,000	Resort Opened on 19	80	80	44
12	Taj Lagoon Resort EMBOODHU FINOLHU	Male' Atoll	Own Incinerator /Thilafushi	3	21	Dhoni	Own Dhoni /Hire Dhoni Mr. Rasheed	500	18,000	40,602	88	88	64

No.	Name of Resort Island	Location (Atol)	Disposal Site	Frequency of Transport. (times / month)	Actual Records January - June, 1998 (times)	Means of Transport. (Barge or Dhoni)	Ownership of the Barge or Dhoni	Transport. and Unload. Cost per Trip (Rfs)	Annual Transport. Cost (Rfs/year)	Annual Hotel Guest in 1997 (bed -nights / year)	Nos. of Staff in Season (person)	Nos. of Staff in Off-season (person)	Nos of Hotel Rooms
13	Kuda Rah Island Resort	Ari Atoll	Incinerating						0	11,432	65	65	30
14	Gangehi Island Resort	Ari Atoll	Alif Atoll North - Mathiveri yard and part incinerating	Every day once		Dhoni	Rented for all Resort purposes	11	4,104	4,935	65	55	25
15	Kudahithi Tourist Resort	Male' Atoll	Thilafushi / Combine with Bodihithi Coral Island and Part Incinerating				Combine with Boduhithi Coral Island		Combine with Boduhithi Coral Island	3,305	17	15	7
16	Boduhithi Coral Island	Male' Atoll	Thilafushi and Part Incinerating	8	48	Dhoni	Rented for all Resort purposes	152	14,592	41,680	110	107	87
17	Villivaru Island Resort	Male' Atoll	Composting using mixtures of ash from incineration and leaves							32,605	115	115	60
18	Biyadoo Island Resort	Male' Atoll	Composting using mixtures of ash from incineration and leaves							48,197	147	147	96
19	Ihuru Tourist Resort	Male' Atoll	Thilafushi	2-3 trips per month	13	Dhoni	Resort Dhoni and Rented Dhoni	740	22,200	26,218	75	75	45
20	Meeru Island Resort	North Male' Atoll	Thilafushi	3 to 4	14 (Island closed from May 93)	Dhoni	Meeru	800	9,600	121,029	310	310	212

(Sheet No.: 3/4)

No.	Name of Resort Island	Location (Attol)	Disposal Site	Frequency of Transport.	Actual Records January - June, 1998	Means of Transport.	Ownership of the Barge or Dhoni	Transport. and Unload. Cost per Trip	Annual Transport. Cost	Annual Hotel Guest in 1997	Nos. of Staff in Season	Nos. of Staff in Off-season	Nos of Hotel Rooms
				(times / month)	(times)	(Barge or Dhoni)		(Rfs)	(Rfs/year)	(bed -nights / year)	(person)	(person)	
21	Kuredu Island Resort	Lhaviyani Atool	Thilafushi	2	10	Dhoni	Kuredu Island Resort	1,458		181,236	335	291	300
22	Bandos Island Resort	Male' Atoll	Thilafushi	15	89	Dhoni	Bandos Island Resort	300	53,400	119,286	470	470	225
23	Rihiveli Beach Resort	Male' Atoll	Male', Thilafushi, Guradoo	8	48	Dhoni	Resort	240	23,040	28,290	120	120	50
24	Lily Beach Resort	South Ari Atoll	Thilafushi	8	48 plus	Dhoni	Lily Hotels Pvt. Ltd.,	2,750	132,000	58,024	150	150	77
25	Cocoa Island	Male' Atoll	Thilafushi	1 to 2	9	Dhoni	Rental	2,200	40,000	522 pax	25	25	8
26	Banyan Tree Maldives VABBINFARU	North Male' Atoll	Thilafushi	Daily	Daily	Dhoni	Rental Dhoni paid monthly	667	240,600	27,852	140	140	48
27	Thari Village (KANUHURAA)	Male' Atoll	Thilafushi	2 forthnightly	12	Dhoni	Monthly rented	500	12,000	10,818	35	35	24
28	Holiday Island Resort	Ari Atoll	?	Daily		Dhoni	Own Dhoni			98,368	300	300	142
29	Vilamendhoo Island Resort	Ari Atoll	Thilafushi	4	24	Dhoni	Resort own	2,000	24,000	48,621	180	160	141
30	Nika Hotel	Ari Atoll	A.Bodufolhudoo reclamation site	30	181	Dhoni	Private	341	124,586	12,912	100	85	27
31	Thulaagiri Island Resort	Male' Atoll	Thilafushi	12	85	Dhoni	Thulaagiri			35,100	135	135	58
32	Vakarufalhi Island	Ari Atoll	Incinerator							31,955	80	80	50
33	Thudufushi Island Resort												47
34	Embudu Village	Male' Atoll	Thilafushi	8 to 12	35 to 45	Dhoni	Resort own and hire Dhoni	1,000	108,000	77,168	120	112	117
35	Giravaru Tourist Resort	Male' Atoll	Thilafushi	Daily (avrg)	150	Dhoni	Giravaru	50	18,000	23,818	100	80	64
36	Gafinolhu	Male' Atoll	Thilafushi	1	1	Dhoni	Don Adam Fulhu	1,220		24,096	54	54	40

(Sheet No.: 4/4)

No.	Name of Resort Island	Location (Attol)	Disposal Site	Frequency of Transport. (times / month)	Actual Records January - June. 1998 (times)	Means of Transport. (Barge or Dhoni)	Ownership of the Barge or Dhoni	Transport. and Unload. Cost per Trip (Rfs)	Annual Transport. Cost (Rfs/year)	Annual Hotel Guest in 1997 (bed -nights / year)	Nos. of Staff in Season (person)	Nos. of Staff in Off-season (person)	Nos of Hotel Rooms
37	Vadoo Diving Paradise	Male' Atoll	Thilafushi	30-31	181	Dhoni	Private Individual	69	25,054	11,485	65	65	33
38	Club Rannalhi	Male' Atoll	Thilafushi	8		Dhoni	Hired	158	15,120	61,035	150	150	116
39	Club Rannalhi	Male' Atoll	Thilafushi	8		Dhoni	Hired			61,035	150	150	116
40	Veligandu Island Resort	North Ari Atoll	Thilafushi	4 to 5	20	Dhoni	Veligandu Island Resort C/O Crown Company	1,320	68,640	43,514	120	110	55
41	Bathala Island Resort	Ari Atoll	none	nil	nil	Dhoni (future)	Hired Dhoni (future)	nil	nil	22,071	54	54	37
42	Madoogali Resort	Ari Atoll	South Side	4	24	Dhoni	Private Dhoni	3,000	144,000	27,004	95	90	50
43	Athuruga Island Resort	Ari Atoll	Athuruga Island Resort							23,496	85	75	42
44	Soneva Fushi Resort	Lhaviyani Atoll	Thilafushi	10		Dhoni	Private	1,100	13,200	12,000	130	120	42
45	Fun Island	Male' Atoll	Thilafushi	8	48	Dhoni	Fun Island	441	42,336	68,889	200	200	100

6. Recycling Market Survey

6. RECYCLING MARKET SURVEY

6.1 Recycling Market Survey

6.1.1 Purpose

The survey is aiming at collecting data and information of the market activities of the materials recovered form wastes to search for the future possibility to improve and develop the recycling market in connection with implementation of the SWM plan he develop the .

6.1.2 Survey Period

The survey was carried out in July, 1998.

6.1.3 Procedures of Survey

A surveyor was dispatched to the Transfer Station to wait for the buyers, middleman or the exporters to show up to deal with their business there with the scavengers.

The survey was carried out to have a interview based on the questionnaire sheet and recorded.

6.1.4 Survey Data
Organizations Engaged in Resource Recovery Activities (1/2)

1.	Name of The Organization/Company	MOHAMED RASHEED
2.	Contacting Address, Tel., Fax	H. GOLHAAGE 324056
3.	Year of Establishment	1982
4.	Representative of The Organization/Company	RASHEED
5.	Financial Sources of The Organization	6000/- MRF
6.	Nos. of Person Participating The Activities	-
7.	Major Activities	COCONUT SHELL/SACK/BOTTLE
8.	Year Started Recovery of Resources	SIX MONTHS
9.	Kind of Recovered Materials	COCONUT SHELL/SACK/BOTTLE
10.	Amount of Recovered Materials (ton/month)	2-3BAGS/100BTL/400BGS
11.	Selling Price of The Recovered Materials (Rfs/ton)	15/- 25/- 50/-
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

1.	Name of The Organization/Company	AHMED NASEEM
2.	Contacting Address, Tel., Fax	M.HIVVARU 323426
3.	Year of Establishment	1992
4.	Representative of The Organization/Company	-
5.	Financial Sources of The Organization	600/- MRF
6.	Nos. of Person Participating The Activities	1
7.	Major Activities	/
8.	Year Started Recovery of Resources	1WEEK
9.	Kind of Recovered Materials	MATERIAL/IRON/ZINC
10.	Amount of Recovered Materials (ton/month)	3W-MACHING/COMRESSOR/ANGLE
11.	Selling Price of The Recovered Materials (Rfs/ton)	150/- 12/- 100/-
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

1.	Name of The Organization/Company	MOHAMED ZAID
2.	Contacting Address, Tel., Fax	H-ULIGAMUGE
3.	Year of Establishment	1982
4.	Representative of The Organization/Company	ZAID
5.	Financial Sources of The Organization	800/-
6.	Nos. of Person Participating The Activities	-
7.	Major Activities	-
8.	Year Started Recovery of Resources	-
9.	Kind of Recovered Materials	THIMADA CCA ALUMINUM
10.	Amount of Recovered Materials (ton/month)	50KG 40KG
11.	Selling Price of The Recovered Materials (Rfs/ton)	12/-KG 12/- 6/-
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

1.	Name of The Organization/Company	AHMED NIZAR
2.	Contacting Address, Tel., Fax	G-GULALAGE
3.	Year of Establishment	1990
4.	Representative of The Organization/Company	-
5.	Financial Sources of The Organization	1500/- MRF
6.	Nos. of Person Participating The Activities	
7.	Major Activities	
8.	Year Started Recovery of Resources	IRON SCRAP
9.	Kind of Recovered Materials	300 SHEET/5PIPES
10.	Amount of Recovered Materials (ton/month)	200/- 200/-
11.	Selling Price of The Recovered Materials (Rfs/ton)	
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

1.	Name of The Organization/Company	ABDUL RAHMAN
2.	Contacting Address, Tel., Fax	MA-GONDUMATHEEGE
3.	Year of Establishment	1982
4.	Representative of The Organization/Company	ABDUL RAHMAN
5.	Financial Sources of The Organization	POCKET
6.	Nos. of Person Participating The Activities	2
7.	Major Activities	BUY FROM FIRST PARTY
8.	Year Started Recovery of Resources	1983
9.	Kind of Recovered Materials	IRON/BOTTLES/ZINC/BRASS
10.	Amount of Recovered Materials (ton/month)	DO NOT KNOW
11.	Selling Price of The Recovered Materials (Rfs/ton)	15/- PER 12KG
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

Organizations Engaged in Resource Recovery Activities (2/2)

1.	Name of The Organization/Company	ALI MANIK
2.	Contacting Address, Tel., Fax	FILIGAS GE
3.	Year of Establishment	1990
4.	Representative of The Organization/Company	ALI MANIK
5.	Financial Sources of The Organization	BANK
6.	Nos. of Person Participating The Activities	3
7.	Major Activities	BRASS SELLING
8.	Year Started Recovery of Resources	1991
9.	Kind of Recovered Materials	BRASS
10.	Amount of Recovered Materials (ton/month)	2TONS ONE YEAR
11.	Selling Price of The Recovered Materials (Rfs/ton)	15/- PER 1KG
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

1.	Name of The Organization/Company	ABBAS MOHAMED
2.	Contacting Address, Tel., Fax	BILLOORI MAAGE
3.	Year of Establishment	1980
4.	Representative of The Organization/Company	ABBAS AHMED
5.	Financial Sources of The Organization	OWN
6.	Nos. of Person Participating The Activities	1
7.	Major Activities	GLASS BUYING
8.	Year Started Recovery of Resources	1980
9.	Kind of Recovered Materials	BOTTLES
10.	Amount of Recovered Materials (ton/month)	1500 BTL
11.	Selling Price of The Recovered Materials (Rfs/ton)	1/- EACH BTL
12.	Constraints of The Resource Recovery Activities	

1.	Name of The Organization/Company	TD-PAINTS & TRADING CO. PTE LTD.
2.	Contacting Address, Tel., Fax	TEL: 326442 FAX: 324913
3.	Year of Establishment	1986
4.	Representative of The Organization/Company	IBRAHIM HAMED
5.	Financial Sources of The Organization	OWNERS + BANKS
6.	Nos. of Person Participating The Activities	4
7.	Major Activities	IMPORT EXPORT SHIPPING
8.	Year Started Recovery of Resources	1995
9.	Kind of Recovered Materials	IRON SCRAP
10.	Amount of Recovered Materials (ton/month)	600 TONS, 3 YEAR
11.	Selling Price of The Recovered Materials (Rfs/ton)	1560/- TON
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

1.	Name of The Organization/Company	HAZASH ENTERPRISES PTE LTD.
2.	Contacting Address, Tel., Fax	TEL: 317639 FAX: 324913
3.	Year of Establishment	1984
4.	Representative of The Organization/Company	IBRAHIM ZAKI
5.	Financial Sources of The Organization	BY BANK
6.	Nos. of Person Participating The Activities	6
7.	Major Activities	IMPORT EXPORT
8.	Year Started Recovery of Resources	1995
9.	Kind of Recovered Materials	IRON SCRAP
10.	Amount of Recovered Materials (ton/month)	600 TONS 3 YEARS
11.	Selling Price of The Recovered Materials (Rfs/ton)	1560/- PER TON
12.	Constraints of The Resource Recovery Activities	GO-A-HEAD

1.	Name of The Organization/Company	VUEYAKUMAR
2.	Contacting Address, Tel., Fax	INDIA
3.	Year of Establishment	1990
4.	Representative of The Organization/Company	VISEYAKUMOR
5.	Financial Sources of The Organization	0
6.	Nos. of Person Participating The Activities	3
7.	Major Activities	SELLING/IMPORT
8.	Year Started Recovery of Resources	1991
9.	Kind of Recovered Materials	COPPER ZINC
10.	Amount of Recovered Materials (ton/month)	1TON
11.	Selling Price of The Recovered Materials (Rfs/ton)	13000/- PER TON
12.	Constraints of The Resource Recovery Activities	NO CHANCE

6.2 Materials Recovery Survey at Transfer Station

6.2.1 Purpose

The survey aims at measuring the materials recovered by the scavengers at the Transfer Station for the purpose to consider about the effectiveness of the activities by the scavengers towards improvement of the future SWM plan.

6.2.2 Survey Period

The survey was conducted during the period from 22 August to 6 September, 1996 to take 15 days samples.

6.2.3 Procedures of Survey

A surveyor was assigned for 15 days to take the data from the scavengers working at the Transfer Station. Scavenging is carried out 2 to 3 groups early in the morning and 10 to 15 groups in daytime until evening time. The survey was conducted to measure the weight of the recovered materials by the scavengers working in daytime to evening time.

Survey for Material Recovery at Transfer Station
(Sheet No. 1/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
22	8	1	Mrs. Zareena	51.500	1.750		3.550		7.950			
		2	Mrs. Mariyam	19.500			1.700		4.000	6.750		
		3	Mrs. Khadheeja	33.000			7.190		12.300	9.000		
		4	Mr. Razaaq			17.500						
		5	Mrs. Aisth	13.100					36.000			
		6	Mr. Adam		33.500	13.000	1.900	8.000				Steel
		7	Mr. Soba			2.490					3.900	Casset Tapes
		8	Mr. Rasheed	19.500	10.250			5.400	3.400			Steel
		9	Mrs. Fathun	14.750			3.750		2.590	750		
		10	Mrs. Ainth Adam	9.750	3.400				12.950			
		11										
		12										
		13										
		14										
		15										
23	8	1	Mrs Zareena	32.000								
		2	Mrs. Mariyam	20.525						1.500		
		3	Mrs. Khadheeja	30.000	15.000				7.000			
		4	Mr. Razaaq							6.000	1.250	
		5	Mrs. Aisth									
		6	Mr. Adam		5.000							
		7	Mr. Soba									
		8	Mr. Rasheed									
		9	Mrs. Fathun	16.250								
		10	Mrs. Ainth Adam	46.380	2.000		3.720		13.000	500	750	
		11	Mrs. Sakeena									
		12	Mrs. Ateefa	16.500	2.750		6.400		4.250			
		13	Mr. Satwaa	15.500	8.000							
		14										
		15										

Survey for Material Recovery at Transfer Station
(Sheet No. 2/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
24	8	1	Mrs. Zareena									
		2	Mrs. Mariyam									
		3	Mrs. Khadheeja								6.000	
		4	Mr. Razaaq									
		5	Mrs. Aisth	6.000			3.600					
		6	Mr. Adam		1.500	860					1.900	
		7	Mr. Soba		1.600							
		8	Mr. Rasheed									
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam		1.360							
		11	Mrs. Sakinaa	16.250								
		12										
		13										
		14										
		15										
25	8	1	Mrs Zareena	51.000			7.500				2.500	Tire
		2	Mrs. Mariyam						9.000			
		3	Mrs. Khadheeja						10.000			
		4	Mr. Razaaq									
		5	Mrs. Aisth									
		6	Mr. Adam									
		7	Mr. Soba								2.100	Tire
		8	Mr. Rasheed						5.500		2.500	Tire
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam	19.500	1.080							
		11	Mrs. Abbas							10.500		
		12	Mrs. Khadheeja	34.500							2.000	sand bags
		13	Mrs. Afeera								8.500	sand bags
		14										
		15										

Survey for Material Recovery at Transfer Station
(Sheet No.3/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
26	8	1	Mrs. Zareena	46.750								
		2	Mrs. Mariyam	31.250								
		3	Mrs. Khadheeja	31.500								
		4	Mr. Razaaq		10.750	4.500					2.450	Toys
		5	Mrs. Aisth									
		6	Mr. Adam		2.800							
		7	Mr. Soba		300			10.500			8.880	Toys
		8	Mr. Rasheed									
		9	Mrs. Fathun	16.750								
		10	Mrs. Ainth Adam	32.000					10.000			
		11	Mr. Ahmed								3.900	plastic box
		12	Mrs. Sareefa	15.250						7.250		
		13	Mrs. Sarma	14.500								
		14										
		15										
27	8	1	Mrs Zareena	15.500								
		2	Mrs. Mariyam	12.500		3.560				16.000	1.400	toys
		3	Mrs. Khadheeja									
		4	Mr. Razaaq	20.750								
		5	Mrs. Aisth									
		6	Mr. Adam	6.060				5.200				
		7	Mr. Soba									
		8	Mr. Rasheed									
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam	20.000		3.560						
		11	Mr. Ahmed									
		12	Mrs. Afeefa	30.750					12.500			
		13	Mrs. Sakeena									
		14	Mrs. Salmaa	19.250								
		15										

Survey for Material Recovery at Transfer Station
(Sheet No. 4/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
29	8	1	Mrs. Zareena									
		2	Mrs. Mariyam						6,000			
		3	Mrs. Khadheeja	62,750					8,500	4,750	5,500	battery
		4	Mr. Razaaq									
		5	Mrs. Aisth	33,000					7,500			
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed									
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam	34,500					13,750	2,260		
		11	Mrs. Sareefa	87,500						4,000		
		12	Mrs. Fathumatu Ibrahim	5,500								
		13	Mr. Adam Ali		4,000							
		14	Mr. Abbas									
		15	Mrs. Sarmau							4,000		
30	8	1	Mrs Zareena									
		2	Mrs. Mariyam									
		3	Mrs. Khadheeja	34,250	4,900				4,890	3,880		
		4	Mr. Razaaq									
		5	Mrs. Aisth						2,480			
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed		1,200		1,760		11,950	1,170		
		9	Mrs. Fathun						19,500			
		10	Mrs. Ainth Adam									
		11	Mr. Zaeedh								4,700	
		12										
		13										
		14										
		15										

Survey for Material Recovery at Transfer Station
(Sheet No. 5/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
31	8	1	Mrs. Zareena									
		2	Mrs. Mariyam	34.250				24.750	43.000	2.560		
		3	Mrs. Khadheeja	31.000					8.000	4.000	1.200	shoes
		4	Mr. Razaaq									
		5	Mrs. Aisth	16.000								
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed							4.260		
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam	17.500					8.750			
		11	Mr. Zocedu			7.200						
		12	Mrs. Soreefa							3.400		
		13	Mrs. Satinaa	14.750					3.560			
		14	Mrs. Hawwa			4.050						
		15										
1	9	1	Mrs Zareena	19.500								
		2	Mrs. Mariyam	16.000								
		3	Mrs. Khadheeja	53.500		2.000			12.000	9.000		
		4	Mr. Razaaq			81.000						
		5	Mrs. Aisth	24.500								
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed	33.500			800		17.000			
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam	32.850	600				11.750			
		11	Mr. Riffay								2.700	shoes
		12	Mrs. Sakeena	19.000							1.200	plastic hanger
		13	Mrs. Khadheeja		2.300	800						
		14	Mrs. Salmaa						5.000			
		15	Mrs Aisth		800							

Survey for Material Recovery at Transfer Station
(Sheet No. 6/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
2	9	1	Mrs. Zareena						1,900	1.400		
		2	Mrs. Mariyam									
		3	Mrs. Khadheeja	32.750					2,300	2.800		
		4	Mr. Razaaq									
		5	Mrs. Aisth						10.000	4.000		
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed	33.000		9.800	2.760	4.000	8.000			
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam	33.000					8,480			
		11	Mr. Zaeedh			920					1.000	shoes
		12	Mrs. Hareera	17.500						1.840	3.300	casset tape
		13										
		14										
		15										
4	9	1	Mrs Zareena									
		2	Mrs. Mariyam						10.000	4.000		
		3	Mrs. Khadheeja									
		4	Mr. Razaaq	6.250								
		5	Mrs. Aisth							6.500		
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed								2.750	sink
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam									
		11	Mrs. Hawwd							2.600		
		12	Mrs. Shareefa							9.750		
		13	Mr. Zaeedh						7.000	5.000	6.000	plates
		14	Mrs. Salnaa	1.200						14.000		
		15										

Survey for Material Recovery at Transfer Station
(Sheet No.7/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
5	9	1	Mrs. Zareena			17,500						
		2	Mrs. Mariyam							4,750		
		3	Mrs. Khadheeja	45,000								
		4	Mr. Razaaq					1,200				
		5	Mrs. Aisth							3,660		
		6	Mr. Adam									
		7	Mr. Soba	6,750								
		8	Mr. Rasheed									
		9	Mrs. Fathun				2,000					
		10	Mrs. Ainth Adam									
		11								280		
		12										
		13										
		14	Note) Recovery amount is less than usual days due to rain									
		15										
6	9	1	Mrs Zareena									
		2	Mrs. Mariyam									
		3	Mrs. Khadheeja							4,750		
		4	Mr. Razaaq									
		5	Mrs. Aisth									
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed	4,000	1,050		3,500		6,000			
		9	Mrs. Fathun									
		10	Mr. Rifau		2,000				12,000			
		11									1,800	plates
		12										
		13										
		14	Note) Recovery amount is less than usual days due to rain									
		15										

Survey for Material Recovery at Transfer Station
(Sheet No. 8/8)

(unit:grams)

Year 1998		Group		Type of Materials Recovered from Municipal Waste								Remarks
Day	Month	No.	Name	Coconut Shells	Electric Wire	Electric Appli.	5 Gals. Steel Cans	Other Metals	Bottles	Textiles	Others	
7	9	1	Mrs. Zareena				1,900			10,250		
		2	Mrs. Mariyam	10,200	1,100	1,600				2,740		
		3	Mrs. Khadheeja	49,250	800				15,000	5,250		
		4	Mr. Razaaq									
		5	Mrs. Aisth	14,000		5,000			9,250	5,700	1,000	shoes
		6	Mr. Adam									
		7	Mr. Salmaa	17,500		17,500		9,750	14,500	8,000		
		8	Mr. Rasheed		400					4,280		
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam	37,250	4,220				9,250	12,000		
		11	Mr. rifav			200			2,400			
		12	Mrs. Khadheeja		1,500					4,560		
		13	Mrs. Shareefa						3,400	2,100		
		14										
		15										
		1	Mrs Zareena									
		2	Mrs. Mariyam									
		3	Mrs. Khadheeja									
		4	Mr. Razaaq									
		5	Mrs. Aisth									
		6	Mr. Adam									
		7	Mr. Soba									
		8	Mr. Rasheed									
		9	Mrs. Fathun									
		10	Mrs. Ainth Adam									
		11										
		12										
		13										
		14										
		15										

7. Ocean Current around Maldives

Ocean Current around Maldives (area between 6°N and 2°S)

Between 6°N and 2°S, the currents set predominantly to the W (Indian North-east Monsoon Current) or to the E (Equatorial Counter and Indian South-west Monsoon Currents). Both Indian Northeast Monsoon and Equatorial Counter Currents have high constancy and rate of flow (at times about 100 miles per day) when fully developed.

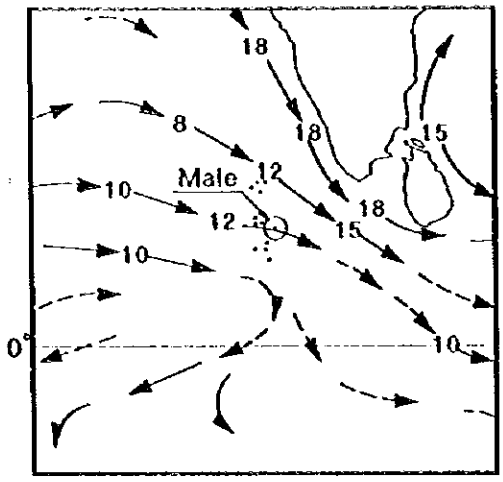
The full development of the Indian Northeast Monsoon Current is apparent in **January** and **February**. In the SW of the area this current approaches close to Equatorial Counter Current (then lying S of about 2°S) but in the SE of the area a zone of variable currents lies between the two streams of opposite flow. During **March** this zone broadens as the Indian Northeast Monsoon Current declines from the E.
By **April** little flow to the W remains; the dominant feature has become the flow to E of the Equatorial Counter Current, S of about 2°N. This current reaches a maximum rate during **May**.

Flow to E or SE is general over the whole area in **June**, though no longer concentrated in the Equatorial Counter Current but associated increasingly with the Indian Southwest Monsoon Current which is developing farther N.

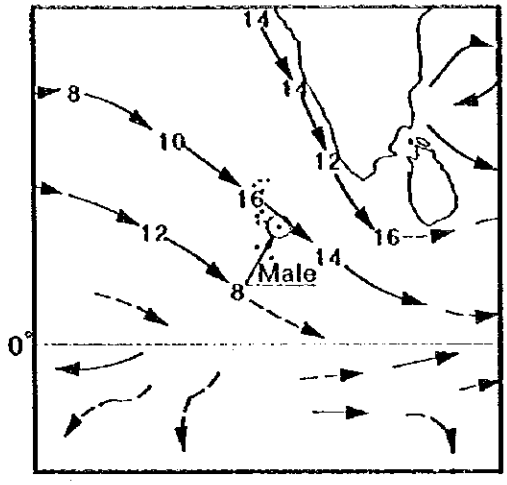
During **July** and **August** the Equatorial Counter Current cannot be identified; there is no longer a strong and steady flow to E near the equator- indeed W of 70°E sets are more frequent to W than to E; the flow to E or SE in the N of the area is better regarded as part of the Indian Southwest Monsoon Current than the Equatorial Counter Current.

In **September** the re-development of the Equatorial Counter Current is evident in the S of the area. The flow reaches a new maximum in **November**.

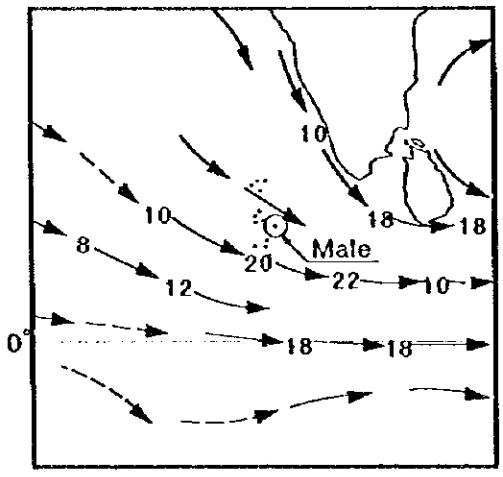
In **December** the Indian Northeast Monsoon Current is developing SW of Sri Lanka; though the current does not yet have any great longitudinal extent it is already quite strong and provides sharp contrast with the E-setting Equatorial Counter Current, only a small distance to the S.



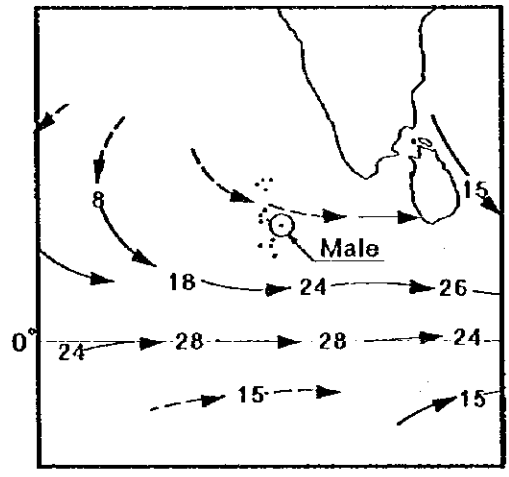
July



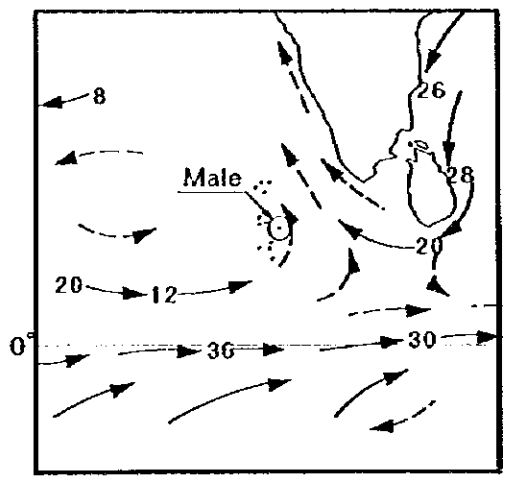
August



September



October



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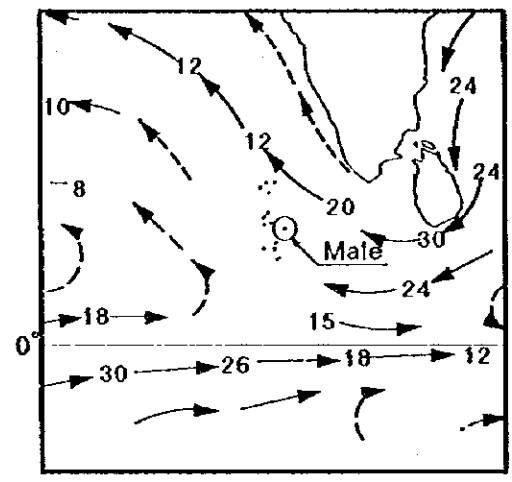
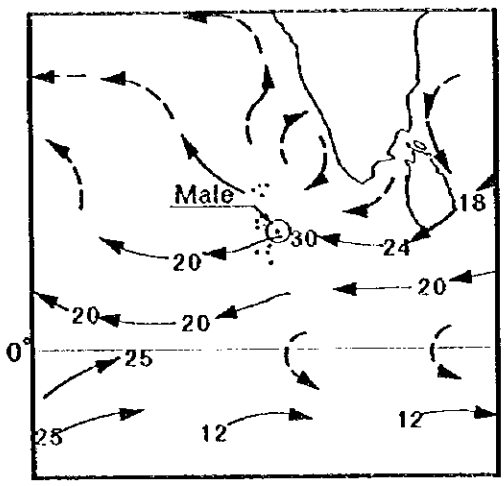


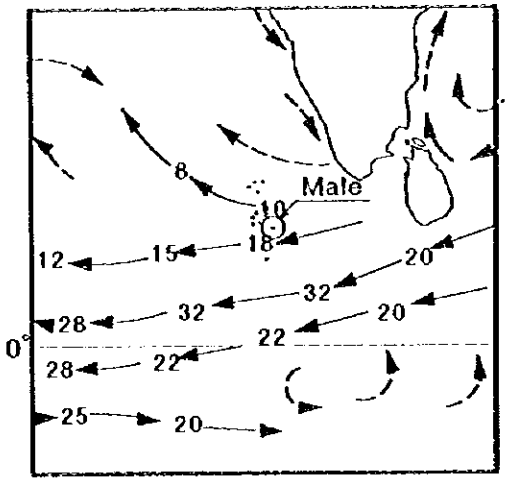
December

Fig. General Circulation of Surface Currents

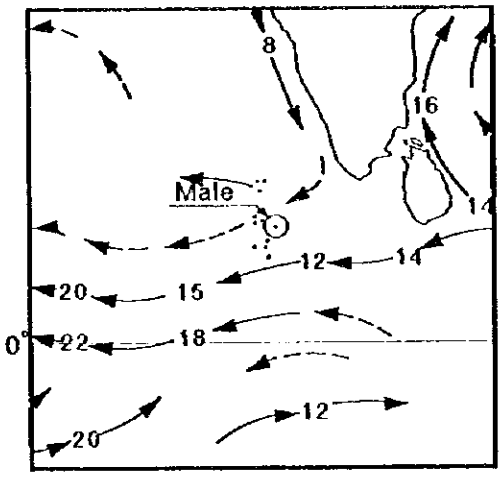
Explanation:
Arrows denote the direction of vector mean flaw, continous arrows where constancy of flow is high, dashed arrows where constancy is low. For storonger flows the vector mean speed (in miles per day) is also indicated.
Source: West Coast of India Pilot, Eleventh Edition Revised 1986, The Hydrographic of the Nave



January



February



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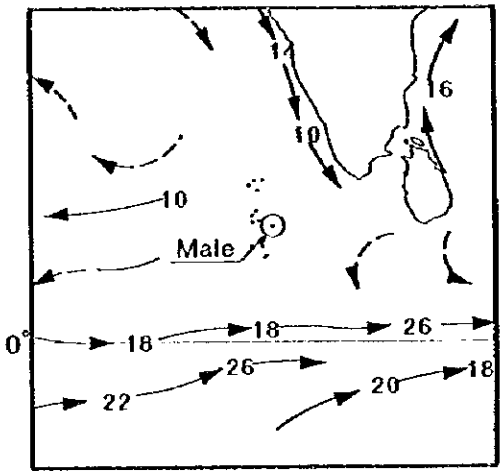

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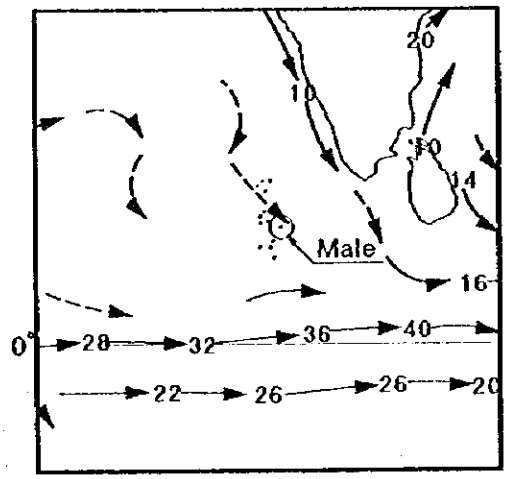
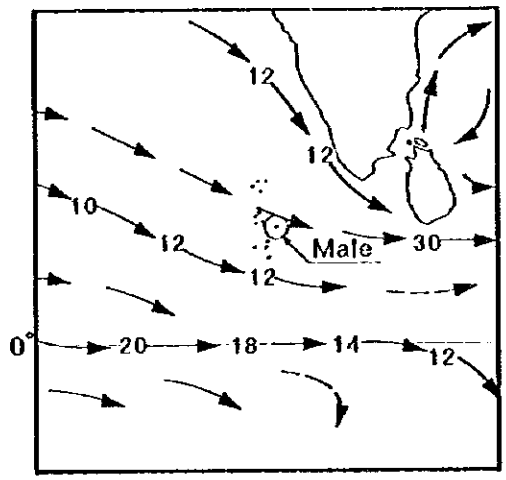


May



June

Fig. General Circulation of Surface Currents

Explanation:
Arrows denote the direction of vector mean flaw; continous arrows where constancy of flow is high, dashed arrows where constancy is low. For storonger flows the vector mean speed (in miles per day) is also indicated.
Source: West Coast of India Pilot, Eleventh Edition Revised 1986, The Hydrographic of the Nave

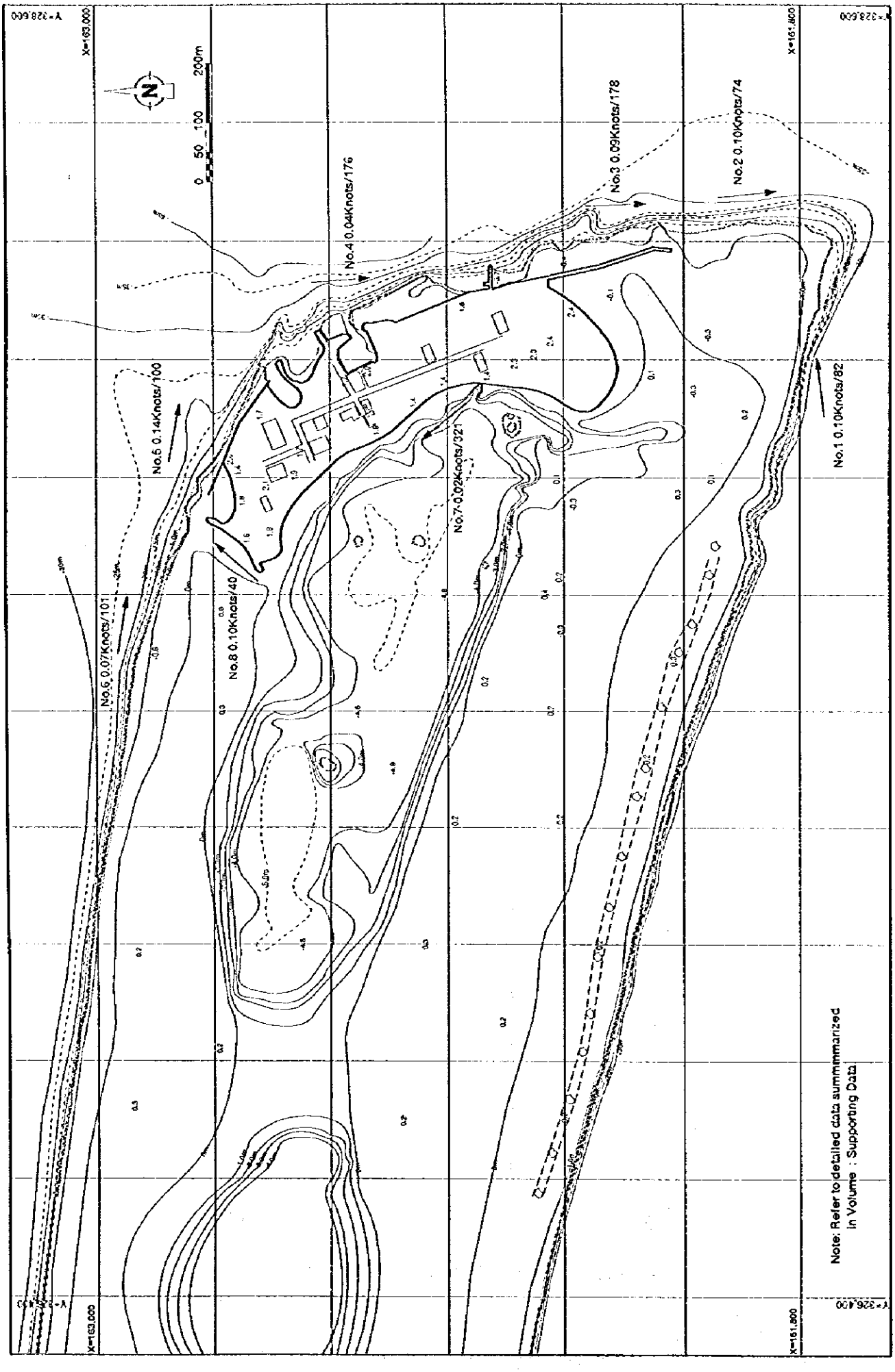


Fig. Current Records (August 1998)

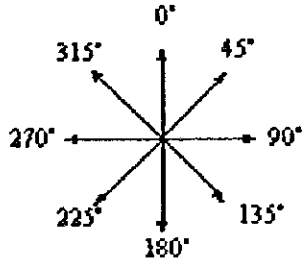
Table Current Survey Record

Location: 1
Date: August 5, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)	310	80	90	100	120	10	75	60	210	190	55	0	110	
	Velocity (m/s)	0.35	0.55	0.55	0.4	0.25	0.15	0.22	0.1	0.35	0.25	0.33	0.15	0.28	
-4m	Direction (°)	280	80	90	100	100	10	75	220	190	190	115	45	120	
	Velocity (m/s)	0.35	0.5	0.51	0.38	0.34	0.2	0.2	0.23	0.38	0.25	0.1	0.18	0.3	
-6m	Direction (°)	270	80	90	95	105	50	55	220	275	250	40	60	90	
	Velocity (m/s)	0.32	0.51	0.47	0.4	0.34	0.26	0.1	0.45	0.12	0.15	0.25	0.2	0.45	
-8m	Direction (°)	310	80	90	90	105	40	70	180	230	220	200	40	85	
	Velocity (m/s)	0.42	0.47	0.5	0.45	0.25	0.2	0.21	0.35	0.35	0.35	0.14	0.27	0.35	
-10m	Direction (°)	330	80	80	90	100	230	100	90	250	235	265	75	85	
	Velocity (m/s)	0.4	0.49	0.57	0.45	0.3	0.3	0.17	0.15	0.4	0.4	0.15	0.13	0.38	
-12m	Direction (°)	260	85	85	90	95	250	195	275	240	260	250	185	70	
	Velocity (m/s)	0.35	0.46	0.53	0.45	0.3	0.2	0.13	0.3	0.19	0.42	0.32	0.1	0.45	
-14m	Direction (°)	320	85	90	90	95	295	185	250	300	250	175	200	80	
	Velocity (m/s)	0.45	0.49	0.5	0.45	0.3	0.25	0.26	0.33	0.2	0.3	0.2	0.19	0.25	
-16m	Direction (°)	350	80	90	90	100	10	115	250	330	305	340	250	115	
	Velocity (m/s)	0.3	0.48	0.45	0.4	0.33	0.2	0.13	0.28	0.27	0.3	0.24	0.18	0.32	
-18m	Direction (°)	300	80	90	90	115	40	85	330	320	335	10	190	80	
	Velocity (m/s)	0.6	0.47	0.51	0.39	0.32	0.2	0.1	0.3	0.19	0.25	0.19	0.14	0.35	
-20m	Direction (°)	305	80	90	100	105	5	75	270	270	280	320	0	80	
	Velocity (m/s)	0.51	0.37	0.43	0.25	0.28	0.23	0.17	0.23	0.4	0.3	0.26	0.28	0.38	

Total Average

Direction (°) 82
Velocity (m/s) 0.10



Direction

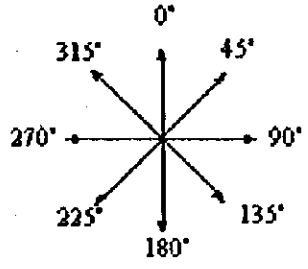
Table Current Survey Record

Location: 2
Date: August 5, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)	90		210	205	165	120	160	190	100	170	130	180	160	
	Velocity (m/s)	0.1	0	0.07	0.09	0.09	0.15	0.25	0.33	0.25	0.17	0.2	0.14	0.08	
-4m	Direction (°)	45	125	180	200	200	210	120	140	210	170	190	180	210	
	Velocity (m/s)	0.07	0.03	0.1	0.26	0.2	0.24	0.19	0.1	0.3	0.15	0.2	0.16	0.26	
-6m	Direction (°)	320		210	190	185	210	180	130	190	140	180	190	180	
	Velocity (m/s)	0.04	0	0.07	0.2	0.18	0.15	0.26	0.15	0.15	0.18	0.15	0.09	0.06	
-8m	Direction (°)	10		230	180	100	180	120	190	160	195	155	120	100	
	Velocity (m/s)	0.08	0	0.19	0.18	0.15	0.08	0.14	0.27	0.16	0.26	0.1	0.13	0.09	
-10m	Direction (°)	305		160	170	90	90	115	170	160	180	110	180	95	
	Velocity (m/s)	0.08	0	0.13	0.17	0.12	0.17	0.17	0.15	0.16	0.26	0.17	0.1	0.12	
-12m	Direction (°)	320		220	150	220	215	200	150	200	150	200	180	210	
	Velocity (m/s)	0.15	0	0.09	0.14	0.1	0.18	0.24	0.16	0.25	0.15	0.27	0.1	0.14	
-14m	Direction (°)	350		180	170	190	180	150	210	130	180	170	160	200	
	Velocity (m/s)	0.09	0	0.1	0.15	0.18	0.18	0.16	0.26	0.14	0.25	0.12	0.1	0.19	
-16m	Direction (°)	305		205	200	190	85	135	190	190	170	300	200	140	
	Velocity (m/s)	0.08	0	0.08	0.16	0.1	0.1	0.11	0.18	0.2	0.23	0.14	0.15	0.1	
-18m	Direction (°)	275		65	180	170	230	190	150	190	170	190	180	105	
	Velocity (m/s)	0.12	0	0.09	0.17	0.12	0.15	0.1	0.15	0.22	0.12	0.15	0.17	0.13	
-20m	Direction (°)	40		160	175	90	185	180	190	100	150	210	110	180	
	Velocity (m/s)	0.1	0	0.06	0.1	0.14	0.12	0.09	0.22	0.16	0.09	0.14	0.11	0.05	

Total Average

Direction (°) 174
Velocity (m/s) 0.10



Direction

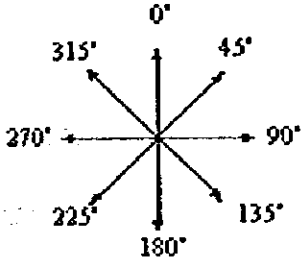
Table Current Survey Record

Location: 3
Date: August 5, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)	70		150	150	100	45	180	105	220	180	120	180	135	
	Velocity (m/s)	0.15	0	0.2	0.16	0.08	0.15	0.16	0.07	0.33	0.16	0.14	0.24	0.18	
-4m	Direction (°)	200	155	150	180	215	40	200	195	200	180	200	180	130	
	Velocity (m/s)	0.15	0.07	0.11	0.13	0.1	0.2	0.1	0.15	0.16	0.14	0.24	0.12	0.26	
-6m	Direction (°)	195		170	140	200	65	190	160	190	180	135	210	140	
	Velocity (m/s)	0.17	0	0.06	0.12	0.16	0.35	0.15	0.12	0.18	0.23	0.15	0.14	0.14	
-8m	Direction (°)	20		180	190	220	270	210	180	180	180	210	180	205	
	Velocity (m/s)	0.07	0	0.09	0.15	0.12	0.1	0.07	0.15	0.12	0.16	0.08	0.14	0.11	
-10m	Direction (°)	75		170	190	170	215	190	200	180	180	210	120	185	
	Velocity (m/s)	0.05	0	0.05	0.18	0.12	0.25	0.15	0.15	0.14	0.21	0.2	0.15	0.17	
-12m	Direction (°)	210		340	150	200	265	210	190	180	180	130	210	160	
	Velocity (m/s)	0.09	0	0.06	0.09	0.1	0.12	0.09	0.16	0.12	0.2	0.15	0.08	0.09	
-14m	Direction (°)	130		10	130	210	210	185	190	180	150	210	190	195	
	Velocity (m/s)	0.05	0	0.17	0.06	0.14	0.1	0.1	0.09	0.16	0.16	0.13	0.14	0.13	
-16m	Direction (°)	50		255	220	50	110	195	185	140	160	190	170	185	
	Velocity (m/s)	0.17	0	0.17	0.12	0.15	0.12	0.1	0.09	0.13	0.09	0.15	0.1	0.13	
-18m	Direction (°)	290		255	215	90	180	170	210	205	190	130	190	165	
	Velocity (m/s)	0.14	0	0.1	0.1	0.05	0.06	0.11	0.13	0.13	0.15	0.11	0.1	0.16	
-20m	Direction (°)	250		20	180	205	355	160	125	180	180	270	180	205	
	Velocity (m/s)	0.08	0	0.09	0.06	0.15	0.06	0.16	0.18	0.11	0.15	0.05	0.14	0.13	

Total Average

Direction (°) 178
Velocity (m/s) 0.09



Direction

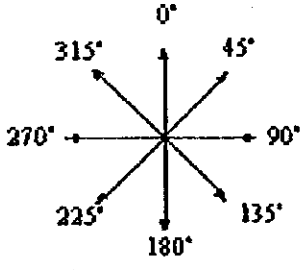
Table Current Survey Record

Location: 4
Date: August 4, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)		160	145	130	160	130	135	145	160	130	140	190	340	320
	Velocity (m/s)		0.2	0.15	0.2	0.18	0.15	0.15	0.1	0.12	0.1	0.15	0.05	0.06	0.05
-4m	Direction (°)		180	180	190	160	140	140	220	180	108	140	250	345	8
	Velocity (m/s)		0.25	0.1	0.25	0.15	0.1	0.1	0.05	0.09	0.1	0.09	0.06	0.14	0.05
-6m	Direction (°)		170	195	160	165	190	190	310	300	155	200	350	340	330
	Velocity (m/s)		0.2	0.15	0.15	0.2	0.14	0.05	0.08	0.05	0.06	0.05	0.07	0.16	0.02
-8m	Direction (°)		180	250	190	160	180	240	340	330	225	120	10	340	350
	Velocity (m/s)		0.15	0.12	0.15	0.2	0.15	0.1	0.1	0.06	0.05	0.1	0.05	0.14	0.1
-10m	Direction (°)		170	200	180	165	210	210	310	340	180	130	0	2	340
	Velocity (m/s)		0.2	0.1	0.2	0.2	0.1	0.09	0.1	0.09	0.05	0.12	0.12	0.09	0.1
-12m	Direction (°)		160	160	190	160	190	275	120	340	115	160	350	350	345
	Velocity (m/s)		0.1	0.05	0.17	0.15	0.1	0.04	0.07	0.1	0.07	0.08	0.09	0.07	0.03
-14m	Direction (°)		140	110	180	170	190	260	340	260	110	170	230	355	345
	Velocity (m/s)		0.12	0.07	0.15	0.15	0.1	0.05	0.2	0.1	0.1	0.08	0.09	0.1	0.05
-16m	Direction (°)		160	210	170	180	210	180	180	340	205	170	70	335	345
	Velocity (m/s)		0.05	0.07	0.08	0.15	0.07	0.12	0.08	0.07	0.05	0.04	0.11	0.1	0.04
-18m	Direction (°)		165	190	180	190	230	60	15	315	250	135	240	340	
	Velocity (m/s)		0.16	0.15	0.1	0.1	0.1	0.05	0.1	0.06	0.07	0.07	0.1	0.05	
-20m	Direction (°)		165	240	250	190	100	170	320	330	110	155	15	110	
	Velocity (m/s)		0.16	0.05	0.1	0.15	0.1	0.05	0.13	0.08	0.08	0.08	0.07	0.06	

Total Average

Direction (°) 176
Velocity (m/s) 0.04



Direction

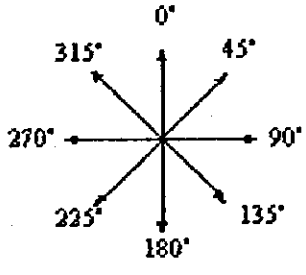
Table Current Survey Record

Location: 5
Date: August 6, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)	85	105	100	90	95	120	200	20	320	60	110	110	120	
	Velocity (m/s)	0.12	0.29	0.33	0.36	0.28	0.18	0.11	0.35	0.3	0.15	0.31	0.35	0.36	
-4m	Direction (°)	100	120	130	130	110	130	210	10	310	85	90	110	90	
	Velocity (m/s)	0.12	0.29	0.33	0.32	0.25	0.15	0.06	0.27	0.3	0.11	0.3	0.35	0.36	
-6m	Direction (°)	120	130	130	125	110	115	210	10	325	150	105	100	80	
	Velocity (m/s)	0.12	0.35	0.31	0.33	0.25	0.13	0.11	0.41	0.17	0.38	0.17	0.25	0.41	
-8m	Direction (°)	130	120	110	125	110	100	260	10	275	55	100	120	80	
	Velocity (m/s)	0.14	0.3	0.25	0.28	0.26	0.14	0.05	0.31	0.26	0.29	0.21	0.23	0.27	
-10m	Direction (°)	160	105	130	110	115	90	15	10	245	100	110	110	80	
	Velocity (m/s)	0.15	0.26	0.27	0.28	0.25	0.16	0.08	0.3	0.31	0.25	0.22	0.26	0.16	
-12m	Direction (°)	140	100	130	110	110	90	230	10	275	80	115	120	120	
	Velocity (m/s)	0.2	0.2	0.27	0.25	0.24	0.14	0.09	0.3	0.2	0.21	0.26	0.37	0.18	
-14m	Direction (°)	115	100	120	105	110	90	325	10	0	170	100	110	105	
	Velocity (m/s)	0.15	0.21	0.26	0.21	0.19	0.11	0.09	0.35	0.26	0.15	0.3	0.2	0.11	
-16m	Direction (°)	80	90	120	120	105	100	270	10	0	140	100	105	180	
	Velocity (m/s)	0.14	0.2	0.25	0.21	0.16	0.11	0.11	0.35	0.16	0.15	0.24	0.2	0.08	
-18m	Direction (°)	80	100	105	120	115	115	275	280	10	45	55	90	265	
	Velocity (m/s)	0.14	0.22	0.25	0.23	0.17	0.1	0.1	0.21	0.13	0.15	0.12	0.17	0.05	
-20m	Direction (°)	80	100	95	105	120	110	255	290	180	160	150	15	320	
	Velocity (m/s)	0.13	0.18	0.26	0.26	0.17	0.12	0.11	0.18	0.2	0.15	0.22	0.14	0.16	

Total Average

Direction (°) 100
Velocity (m/s) 0.14



Direction

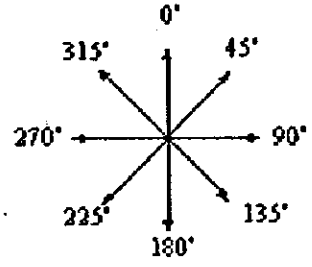
Table Current Survey Record

Location: 6
Date: August 6, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)	140	105	120	70	70	125	30	0	0	70	80	110	105	
	Velocity (m/s)	0.06	0.19	0.26	0.22	0.35	0.17	0.11	0.08	0.12	0.16	0.2	0.25	0.31	
-4m	Direction (°)	160	140	175	90	25	120	265	0	0	95	165	120	120	
	Velocity (m/s)	0.27	0.33	0.08	0.27	0.08	0.09	0.1	0.15	0.11	0.11	0.28	0.24	0.26	
-6m	Direction (°)	155	180	270	120	150	120	210	0	10	190	90	105	105	
	Velocity (m/s)	0.22	0.2	0.24	0.16	0.4	0.12	0.11	0.13	0.1	0.15	0.21	0.26	0.28	
-8m	Direction (°)	150	310	305	150	160	100	240	10	10	90	50	105	120	
	Velocity (m/s)	0.14	0.38	0.27	0.25	0.25	0.1	0.13	0.14	0.1	0.18	0.12	0.22	0.22	
-10m	Direction (°)	100	350	310	155	160	90	240	10	15	290	50	130	100	
	Velocity (m/s)	0.12	0.39	0.28	0.31	0.24	0.15	0.09	0.05	0.16	0.2	0.16	0.16	0.26	
-12m	Direction (°)	60	0	0	115	150	110	275	40	285	100	170	125	120	
	Velocity (m/s)	0.1	0.37	0.27	0.23	0.22	0.08	0.05	0.15	0.3	0.13	0.15	0.16	0.21	
-14m	Direction (°)	65	170	310	90	150	150	350	40	285	270	170	110	100	
	Velocity (m/s)	0.1	0.28	0.36	0.23	0.25	0.09	0.05	0.15	0.22	0.2	0.18	0.14	0.18	
-16m	Direction (°)	100	270	70	90	130	140	55	30	285	310	245	140	90	
	Velocity (m/s)	0.11	0.08	0.38	0.2	0.25	0.11	0.12	0.18	0.2	0.26	0.21	0.2	0.2	
-18m	Direction (°)	130	80	35	90	145	140	20	20	280	230	180	130	90	
	Velocity (m/s)	0.14	0.09	0.26	0.19	0.16	0.11	0.12	0.26	0.27	0.18	0.21	0.19	0.21	
-20m	Direction (°)	125	210	30	85	110	140	360	20	270	140	40	90	90	
	Velocity (m/s)	0.12	0.37	0.31	0.18	0.09	0.09	0.08	0.26	0.35	0.18	0.23	0.14	0.21	

Total Average

Direction (°) 101
Velocity (m/s) 0.07



Direction

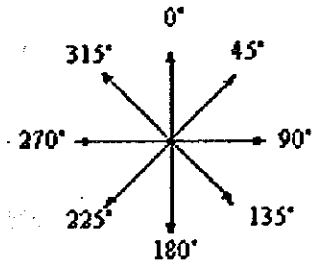
Table Current Survey Record

Location: 7
Date: August 6, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)	320	35		330	300	160	20	280			210		180	
	Velocity (m/s)	0.1	0.13	0	0.12	0.07	0.05	0.12	0.15	0	0	0.08	0	0.1	
-4m	Direction (°)	340	20	310	310	265	55	330	295	40					
	Velocity (m/s)	0.06	0.06	0.05	0.06	0.08	0.07	0.07	0.1	0.06	0	0	0	0	
-6m	Direction (°)				310	260	65	·	275						
	Velocity (m/s)		0	0	0.06	0.05	0.08	0	0.06						
-8m	Direction (°)														
	Velocity (m/s)														
-10m	Direction (°)														
	Velocity (m/s)														
-12m	Direction (°)														
	Velocity (m/s)														
-14m	Direction (°)														
	Velocity (m/s)														
-16m	Direction (°)														
	Velocity (m/s)														
-18m	Direction (°)														
	Velocity (m/s)														
-20m	Direction (°)														
	Velocity (m/s)														

Total Average

Direction (°) 321
Velocity (m/s) 0.02



Direction

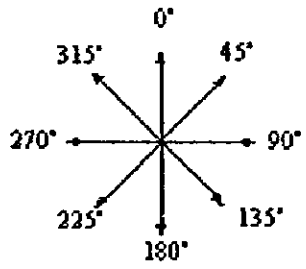
Table Current Survey Record

Location: 8
Date: August 11, 1998

Depth		6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
-2m	Direction (°)						40	45		40	40	40	240		
	Velocity (m/s)						0.18	0.18	0	0.18	0.17	0.1	0.05	0	
-4m	Direction (°)														
	Velocity (m/s)														
-6m	Direction (°)														
	Velocity (m/s)														
-8m	Direction (°)														
	Velocity (m/s)														
-10m	Direction (°)														
	Velocity (m/s)														
-12m	Direction (°)														
	Velocity (m/s)														
-14m	Direction (°)														
	Velocity (m/s)														
-16m	Direction (°)														
	Velocity (m/s)														
-18m	Direction (°)														
	Velocity (m/s)														
-20m	Direction (°)														
	Velocity (m/s)														

Total Average

Direction (°) 40
Velocity (m/s) 0.01



Direction

8. Laws and Organization

Law NO: 4/93(unofficial translation)

ENVIRONMENT PROTECTION AND RESERVATION ACT OF MALDIVES

Introduction

1. The natural environment and its resources are national heritage that needs to be protected and reserved for the benefit of future generations.
The protection and reservation of the countries land and water resources, flora and fauna as well as the beaches, reefs, lagoons and all natural habitats are important for the sustainable development of the country.

Environmental Guidance

2The concerned government authorities shall provide the necessary guidelines and advice on environmental protection in accordance with the prevailing conditions and needs of the country. All concerned parties shall take due consideration of the guidelines provided by the government authorities.

Environment Protection and Conservation

3. The Ministry of Planning, Human Resources and Environment shall be responsible for formulating policies, as well as rules and regulations regarding the environment in areas that do not already have a designed government authority already carrying out such functions.

Protected Areas and Natural Reserves

4. (a) The Ministry of Planning, Human Resources and Environment shall be responsible for identifying protected areas and natural reserves and for drawing up the necessary rules and regulations for their protections and reservations.

(b) Anyone wishing to establish any such are as mentioned in (a) of this clause, as such that area at the Ministry of Planning, Human Resources and Environment and abide by the rules and regulations laid down by the ministry.

Environment Impact Assessment (EIA)

5. (a) An impact assessment study shall be submitted to the Ministry of Planning, Human Resources and Environment before implementing any developing project that may have a potential impact on the environment.

(b) The Ministry of Planning, Human Resources and Environment shall formulate the guidelines for EIA and shall determine the projects that need such assessment as mentioned in paragraph (a) of this clause.

The Termination of project

6. The Ministry of Planning, Human Resources and Environment has the authority to terminate any project that has any undesirable impact on the environment. A project

so terminated shall not receive any compensation.

Waste Disposal, Oil Poisonous Substances

7. (a) Any type of waste, oil, poisonous gases or any substances that may have harmful effects on the environment shall not be disposed within the territory of the Maldives.
(b) In case where the disposal of the substances stared in paragraph (a) of this clause becomes absolutely necessary, they shall be disposed only within the areas designated for the purpose by the government. If such waste is to be incinerated, appropriate precaution should be taken to avoid any harm to health of the population.

Hazardous/Toxic or Nuclear Wastes

8. Hazardous/Toxic or Nuclear Wastes that is harmful to human health and the environment shall not be disposed anywhere within the territory of the country. Permission should be obtained from the Ministry of Transportation and Shipping at least 3 months in advance for any transboundary movement of such wastes through the territory of the Maldives.
The Penalty for Breaking the Law and Damaging the Environment

9. (a) The penalty for minor offences in breach of this law or any regulations made under this law, shall be a fine ranging between RF 5.00 (five Rufiyaa and RF 500.00 (five hundred Rufiyaa) depending on the actual gravity of the offence. The fine shall be levied by the Ministry of Planning, Human Resources and Environment or by any other government authority designated by that ministry.

(b) Except for those offences that are stated in (a) of this clause, all major offences under this law shall carry a fine of not more than Rf100, 000,000.00 (one hundred million Rufiyaa) depending on the seriousness of the offence. The fine shall be levied by the Ministry of Planning, Human Resources and Environment.

Compensation

10. The government of the Maldives reserves right to claim compensation for all damages that are caused by activities that is detrimental to the environment. This includes mentioned in clause No. 7 of this law as well as those activities that take place outside the projects that are identified here as environmentally damaging.

Definition

11. This law
(a) The "environment" means all living and non-living things that surrounds and effects the lives of human beings.
(b) A "project" is any activity that is carried out with the purpose of achieving a certain social or economic objectives.

National Commission for the Protection of the Environment (NCPE)

Name	Designation	Office
1. Hon. Abdul Rasheed Hussain	Minister	Ministry of Planning, Human Resources & Environment
2. Mr. Abdullahi Majeed	Deputy Minister	Ministry of Planning, Human Resources & Environment
3. Mr. Hussain Shihab	Deputy Minister	Ministry of Planning, Human Resources & Environment
4. Mr. Mohamed Ali	Director, Environmental Research	Ministry of Planning, Human Resources & Environment
5. Mr. Mohamed Khaleel	Deputy Director, Environmental Affairs	Ministry of Planning, Human Resources & Environment
6. Mr. Ibrahim Zuhoor	Member of the Parliament	
7. Mr. Faaruq Hassan	Member of the Parliament	
8. Mr. Abdul Mameed Abdul Hakeem	Deputy Minister	Ministry of Education
9. Mr. Ahmed Shareeff	President	Male' Municipality
10. Conl. Shaukath Ibrahim	Colonel	Ministry of Defense and National Security
11. Mr. Hussain Mohamed	Director General	Television Maldives
12. Mr. Ahmed Saleem	Director General	Ministry of Women's Affairs and Social Welfare
13. Mr. Maizan Ibrahim Manik	Director General	Ministry of Construction and Public Works
14. Mr. Mohamad Thaufeeq	Director	Ministry of Transport and Communication
15. Ms. Husna Razee	Director General	Institute of Health Science
16. Mr. Ismail Firag	Director	Ministry of Tourism
17. Mr. Abdulla Naseer	Senior Reef Research Officer	Ministry of Fisheries and Agriculture
18. Mr. Ilyas Hussain	Under Secretary	Ministry of Atolls Administration
19. Mr. Mohamed Shiyam	Senior Project Officer	Ministry of Trade, Industries and Labour

List of Marine Protected Areas in the Maldives

North Male' Atoll

1. Makunudhoo Kandu (Makunudhoo Channel)
2. Rasfari
3. Girifushi Thila (H.P Reef, Thamburudhoo Thila)
4. Banana Reef
5. Giraavaru Kuda Haa
6. Lion's Head
7. Hans Hass Place (Hans Place, Kikki Reef, Dragon's Mouth)

South Male' Atoll

8. Embudhoo Kandu (Embudhoo Channel)
9. Guraidhoo Kanduolhi (Guraidhoo Channel)

Ari Atoll

10. Maaya Thila (Maayafushi Thila)
11. Orimasu Thila (Maagau Thila)
12. Fish Head (Mushimasmigili Thila)
13. Kudarah Thila (Pink Shark Thila)

Lhaviyani Atoll

14. Fushifaru Thila (Fushivaru Thila)

Vaavu Atoll

15. Miyaru Kandu (Dhevana Kandu)

UNOFFICIAL TRANSLATION
Law No. 15/79

LAW ON TOURISM IN MALDIVES

1. Tourist resorts, tourist hotels and tourist guesthouses in the Maldives, shall be registered at the Ministry of Tourism and operated in accordance with the relevant regulations.

2. The Government of Maldives shall levy a (tourism) tax of six United States Dollars (US $ 6.00) or its equivalent in a currency acceptable to Maldives Monetary Authority, per person per day from every tourist for every day he spend in the tourist resort, tourist hotel or tourist guest house operated in the Maldives. It shall be the responsibility of the operator of the resort, hotel or guesthouse to collect the said tax from the tourists who reside therein and pay it in full to the Government. The tax payable for the preceding month shall be paid before the 16th day of the current month.

3. (Clause 3 has been deleted in accordance with Law No. 11/80)

4. Information regarding the tourists who were resident in the tourist resort, tourist hotel, or tourist guest house during the preceding month shall be submitted in accordance with the relevant rules by the operator of resort, hotel, or guest house to the Ministry of Tourism before the 8th day of the current month.

5. In the event, the owner of a private tourist resort or tourist hotel in Maldives wishes to entrust the management to another party, either by a lease or any other basis, an offer shall first be made to the Maldivian Government. The management must be entrusted to such other party through the Ministry of Tourism, only if the Maldivian Government declines to accept the management of the resort or hotel.

6. No tourist resort or tourist hotel shall be taken over from the operators without giving at least two years, notice except at an instance when its required for the country's defense.

7. (a) Should the operator of a tourist resort, tourist hotel , or tourist guest house contravene the provisions of this Law in making the tax payments as stipulated herein , he shall be liable to pay, in addition to the tax due ,a fine of one thousand Maldivian Rufiyaa (RF1,000/-) per registered bed at the time of the contravention. Should be repeat such an act, he shall pay a fine equal to twice the amount fined on this basis, at the first instance.
(b) Any person who contravene the provisions of this Law in any manner other than stated in (a) of this Article, shall be fined a sum of money not less than one thousand Maldivian Rufiyaa (RF1, 000/-) and not more than ten thousand Maldivian Rufiyaa (RF10, 000/-).
(c) Any person who has been fined under the provision of (a) or (b) above has the right, if he does not accept the fine (imposed on him) as valid, to take the matter to the shariath Court. Should be proved before the Court that he has not contravened the Law, the fine paid by him shall be refunded to him in full.

Those who are given special privileges by the Government shall be exempted from paying the tax levied under this Law.

Note:
In this Law-

(a) " Tourist resort," means an island or special area of an island where board and lodging facilities are generally provided for tourist.

(b) " Tourist Hotel" or " tourist Guest House" in this Law means a place in an inhabited island, or a vessel, where board and lodging, is generally provided for tourists.

(c) " A tourist " in this Law means every one visiting the Maldives who is not in possession of a resident permit. A resident permit is a permit given by the concerned authority, in accordance with the relevant rules to stay in the Maldives as a non-tourist.

This Law shall come into force from the first day of November 1989.

This Law has been up dated by including the amendment brought about by Law No: 11/80, 14/ 80, 4/82, 6/83 and 2/87.

Law No. 3/94
17 April 1994

LAW RELATING THE LEASE OF UNINHABITED ISLANDS FOR THE DEVELOPMENT OF TOURISM RESORTS

1. Tourist resorts shall be developed on uninhabited islands that are designated by the Government for the purpose.

2. Islands shall be leased for the development of tourist resorts in a public tender held by the Ministry of Tourism and in accordance with the establishment procedure to the party that submits the best proposal. Islands in which the Government invests directly or in collaboration with a foreign party shall be exempted from this procedure.

3. The maximum period for which islands may be leased for the development of tourist resorts shall be 21 years commencing from the date the islands is handed over to the lease. However, if the initial investment exceeds United States Dollars 10 million, the Government shall have the right to lease such islands for a maximum period of 35 years considering the size of the investment and the standard of the resort to be developed.

4. Islands shall be l eased for the development of tourist resorts on condition that the buildings erected on the resorts islands and the movable items thereon are handed over to the Government without compensation therefor and at the same standards as the resort was being operated. The agreements to be concluded pursuant to Section 6 of this Law shall also include a provision to the effect that the buildings and the movable items on the islands mentioned in the said Section should be handed over to the Government without compensation therefor and at the same standard as the resort was being operated, upon the expiry of term of the agreement.

5. Tourist resorts shall be developed on islands leased under this law only in accordance with an agreement signed between the Ministry of Tourism and the lessee. Such agreement shall include the following:-

a) the period of lease
b) the period given for construction, if any, during the period of lease and the date on which the resort will commence operations.
c) the rent and the manner in which the rent will be paid.
d) procedures to be followed if the lessee wishes to sub-lease the resort or to change another party with the management of the resort.
e) actions to be taken in the event the lessee violates the agreement.

6. (a) Within 6 months from the date this Law enters into force, the agreement mentioned in section 5 shall be concluded between the Ministry of Tourism and the owners of the

buildings and the movable items on the islands for which permissions were issued prior to the enactment of this Law for their development as tourist resorts without a definite period.

7. In the agreements mentioned in section 6 rent shall be fixed in a manner in which the rent from the islands for which the agreements are made becomes equivalent within five years, on an incremental basis to be set out in the agreement, to the rent earned by the Government from the islands in that region which have been leased under an agreement.

8. In the event if an owner of the buildings and movable items on an island for which permission was issued prior to the enactment this Law, for its development as a tourist resort without a definite period does not wish to enter into the agreement mentioned in Section 6 of this Law, in accordance with the previous hereof, then such island shall be taken over and just compensation paid for the buildings and movable items thereon.

9. This Law shall not affect or change the lease period of the islands, which have been leased under an agreement with the Ministry of Tourism prior to the enactment of this Law. The lease period of such islands shall be effective from the date so specified in such agreements.

DISPOSAL OF GARBAGE

1. Garbage from tourist resorts should be disposed of in a manner that would not cause any damage to the environment.

2. All garbage disposed into the sea should be done as far away into the sea as necessary in order to ensure that it does not get washed onto any islands with the current.

3. Empty cans should be compressed and bottles should be broken into small pieces before disposing into the sea.

4. Plastic or poliethene bags should not be thrown into the sea. These must be burnt.

5. Those who contravene this regulation will be fined. The amount shall vary between Rf 100/- and Rf 2,000/- depending on the facts and circumstances. If contravention of this regulation is prepared the fine shall be doubled.

6. Tourist resorts are required to have incinerators and compactors adequate in size to burn all flammable materials and crush all the cans respectively. Those who lack these facilities will not be allowed to operate.

Laws of the Road (UNOFFICIAL TRANSLATION)

People should clean the road surrounding their homes.

It is forbidden for anyone to left animals loose on the roads (e.g.. cows, chickens, hens and goats).

It is forbidden for anyone to sleep on the pavement and on the market area.

People, who sell imported goods and handcarts, should sell their goods on the West Side of Majeedee Magu.

Anyone is wanting to dig the road for the supply of electricity, telephone, sewerage pipes should fill in a form given by the Male' Municipality and get permission to do so. (This form is filled by Electricity Board, MWSA and Dhiraagu)

The permission by digging the roads are giving as follow:

1. The digging should be carried out without causing the pedestrians any disturbances.

2. Until the digging is over the workers should put a red flag of in morning or a red lamps at the area they are digging to signify the pedestrian and drivers.

3. The works should finish the work within 7 days after the permission is given if not they should renew their permission.

4. It is forbidden for any one to play football or any other game on the road, and it is also forbidden to fly laths on the walls and rooftops.

5. It is against the law for anyone to steal sand or stone in the marine drive or in any other road without the permission of the Municipality. If a person does so then he will be fined to price on the sand/stone bags etc.

If you want to demolish a building forming the road, you should build a temporally wall to cover the demolished building.

It is against to the law to keep vehicles like lorries, cars and tractors on the road for long hours which has been taken prepared and it is also forbidden to repair them as well.

It is against the law to keep empty box or garbage in front of any shops.

It is against the law to skate on any road if might cause a serious accident.

It is against the law to hang laundry on the front of the house.

It is against the law to throw garbage into the sea or road.

It is against the law to place garbage on outside of shops in the marine drive road.

All the garbage should be disposed to the dump area.

People should walk on the side of the roads well made that is people should walk to the pavement and use the crossings.

Organization Structure of the Government of Maldives

(November 1998)

President

Ministry of Defence and National Security

Ministry of Finance and Treasury

Ministry of Atolls Administration

Ministry of Justice

Ministry of Foreign Affairs

Ministry of Youth and Sports

President Office

Ministry of Construction and Public Works

Ministry of Home Affairs, Housing and Environment

Ministry of Fisheries, Agriculture and Marine Resources

Ministry of Women's Affairs and Social Security

Ministry of Health

Ministry of Planning and National Development

Ministry of Tourism

Ministry of Education

Ministry of Information, Arts and Culture

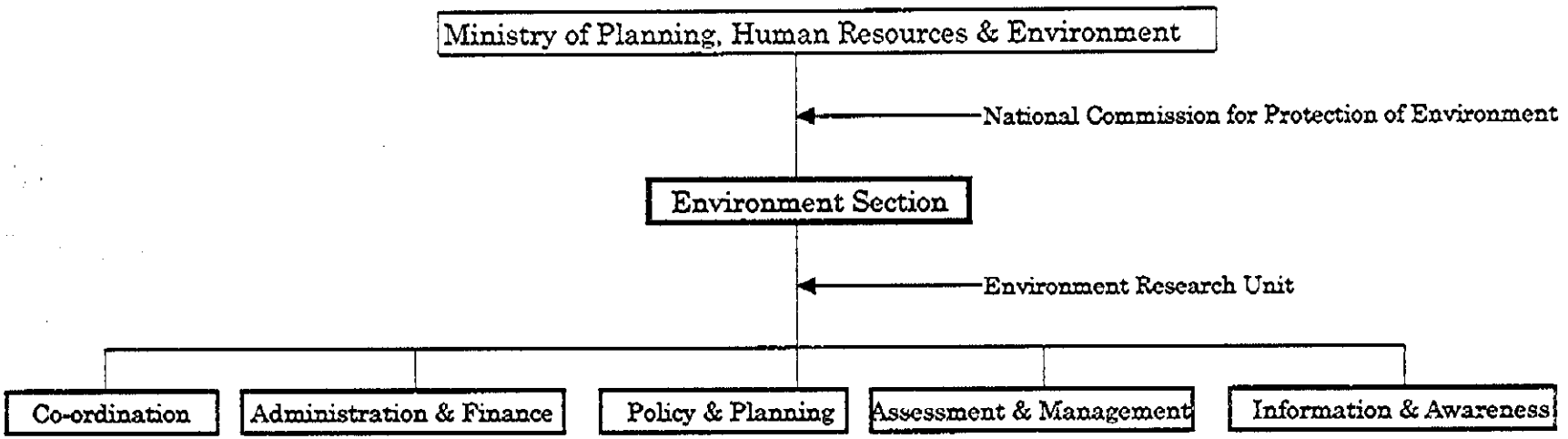
Ministry of Trade and Industries

Ministry of Transport and Civil Aviation

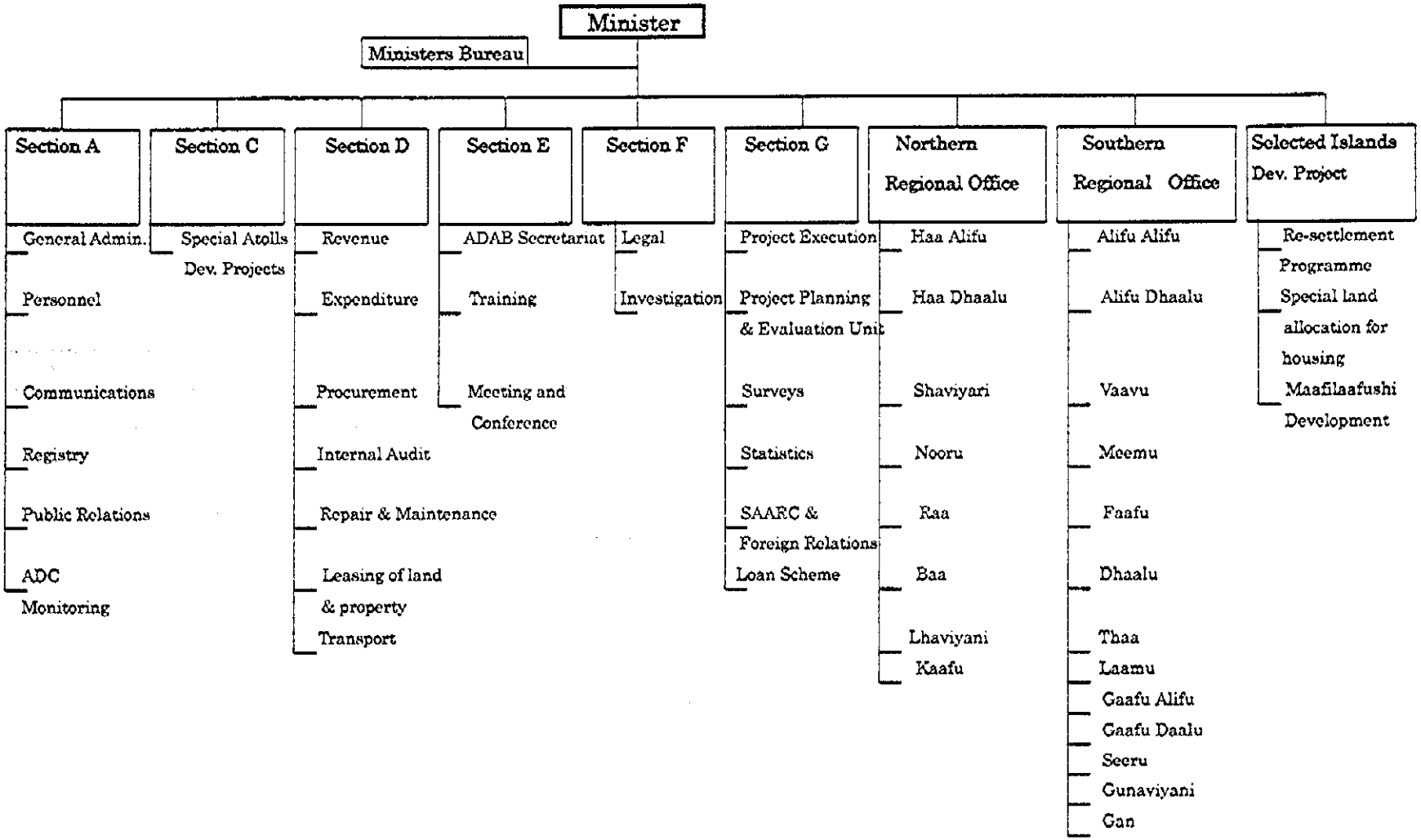
Ministry of Human Resources, Employment and Labour

Attorney-General Office

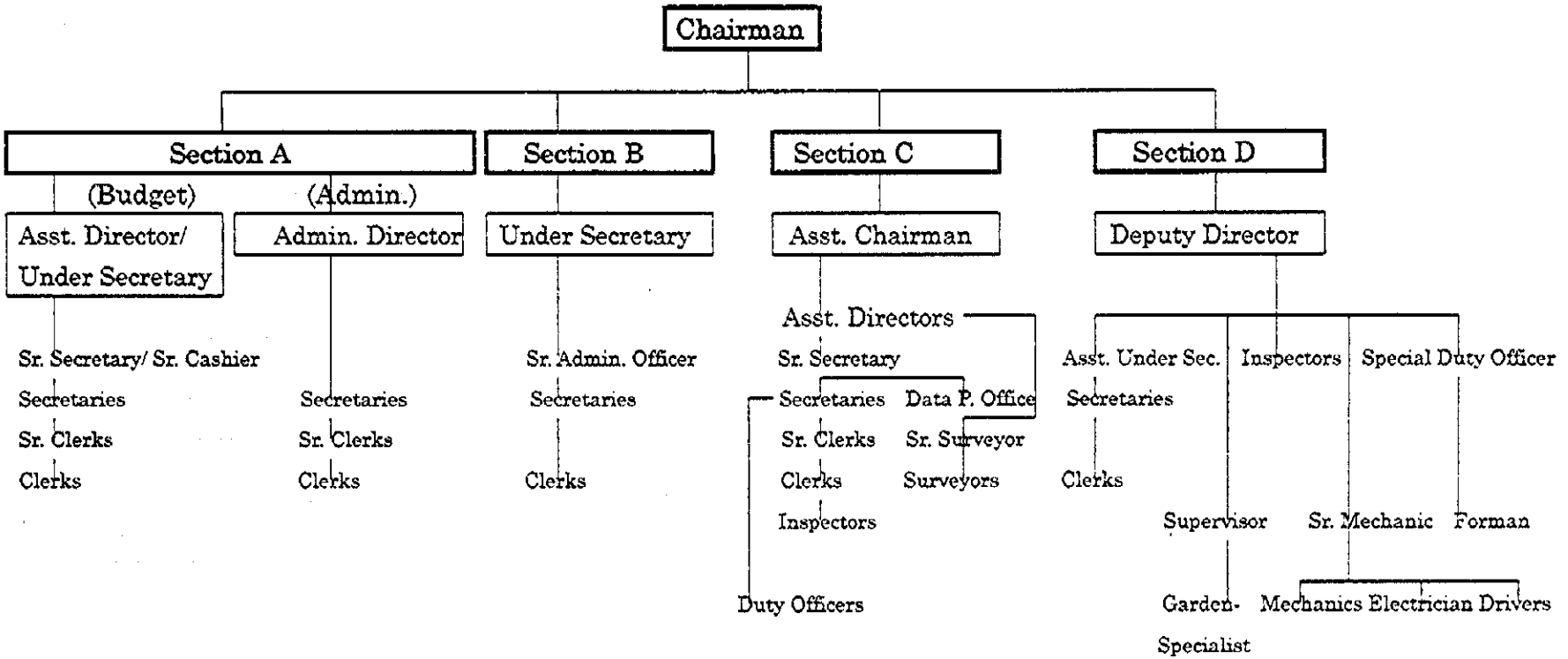
Organizational Scheme of Environment Unit



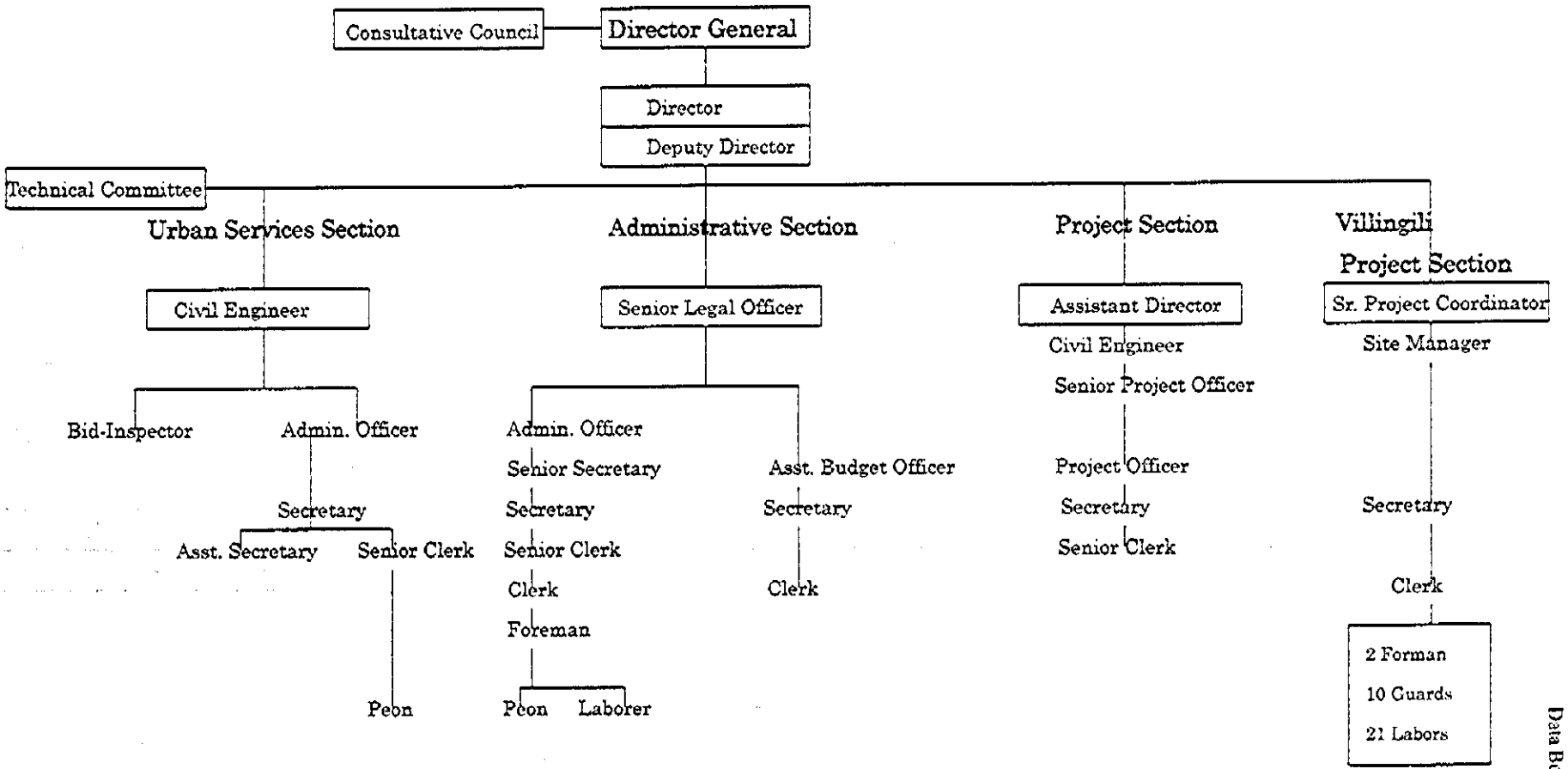
Organization Chart of Ministry of Atolls Administration



Organization Chart of Male' Municipality



Organization Structure
Maldives Housing and Urban Development Bord



9. Leachate Diffusion and Dispersion Experiment in Thilafushi

Leachate Diffusion and Dispersion Experiment in Tilafushi

1. Experimental System

Three (3) types of solid waste confinement wells each with diameter of about 2m and depth of about 2.5m were constructed in an area away, as far as possible, from the area reclaimed with solid waste in the Tilafushi Island. In effect all practical purpose the area selected for the provision of these three (3) wells is reclaimed only with coral sand dredged from the Tilafushi reef. Unfortunately such an area was located only in the south- eastern area of the island adjacent to the coast.

Each of the three (3) solid waste confinement wells, named as A, B and C from the southern most well to the northern one, were filled with essentially biodegradable organic solid waste matter and allowed to decompose naturally and in the process leading to the generation of leachate. The solid waste in the Well A was confined with concrete wall protection. The solid waste in Well B was confined with vinyl sheet wall protection and that of Well C with no artificial protection and hence the control system for the experiment.

Four (4) monitoring bore-holes, two (2) for each side of a well in a linear direction, were provided for each well to monitor the dispersing leachate quality resulting in a total of 12 bore-holes. The four (4) bore-holes of Well A are referred to as A1, A2, A3 and A4, that of Well B as B1, B2, B3 and B4 and that of Well C as C1, C2, C3 and C4.

2. Sampling and Analysis

The leachate quality sampling in each of the 12 bore-holes were conducted once a week for about 2 months, from 13 December, 1998 to 21 February, 1999. In total the leachate sampling was conducted 10 times. It is noted that no sampling was conducted for the second week of February 1999.

The sampling and analysis work was conducted by the PHL (Public Health Laboratory) of the MOH (Ministry of Health). The leachate quality parameters analysed are given below. It is noted that all parameters are analysed in the laboratory.

Parameters of analysis; Temperature, pH, EC (electric conductivity), TDS (total dissolved solids), chloride and COD (chemical oxygen demand).

3. Results and Discussion

The results of analysis in the chronological order of sampling date are shown from Table 1 (initial sampling on 13 December 1998) to Table 10 (final sampling on 21 February 1999).

It is noted that high chloride level mostly exceeding 10,000 mg/l, at times even around 20,000 mg/l same as that of seawater, indicated high dilution of the bore-holes by seawater. This is further demonstrated by the extreme variation in the range of COD, the representative parameter for pollution level of leachate, measured in all samples irrespective of the location of bore-holes. Still, the median value of the COD measured for each of the 3 sets of bore-holes representative to the Wells of A, B and C were very similar of around 60 mg/l as given below.

Median COD of bore-holes A1, A2, A3 and A4 of Well A: 56.875 mg/l

Median COD of bore-holes B1, B2, B3 and B4 of Well B: 59.75 mg/l

Median COD of bore-holes C1, C2, C3 and C4 of Well C: 55.0 mg/l

Based on the above results it is clear that the area availed of for the conduct of the experiment is not satisfactory. The experimental area is located too close to coast and also located downstream of already reclaimed high land with solid waste even though the solid waste reclaimed area is located quite far from the experimental area. Under these limited condition it is considered as impossible to comparatively evaluate the leachate diffusion mitigation potential of various types of leachate confinement system.

4. Conclusion

It is concluded that due to the deficiency in the area availed for the conduct of experiment on leachate diffusion mitigation potential of various types of landfill confinement of solid waste in Tilafushi, no clear results indicating any significant variation in leachate diffusion mitigation was obtained. It is recommended that such an experiment be conducted under controlled condition in laboratory with a long-term time frame to evaluate confidently the leachate diffusion mitigation potential of a variety of solid waste landfill confinement system.

Table 1 Results of Leachate Quality (December 13, 1998)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	28.5	28.6	27.8	27.5	26.9	27.9	27.7	28.2	27.5	28.3	28.1	27.4
pH		7.0	7.0	7.1	7.1	7.2	7.1	7.2	7.4	7.4	7.5	7.9	7.4
E. Conductivity	µs/cm	49840	54560	18000	21440	19220	26120	44520	49240	50400	43960	24360	19520
TDS	mg/l	25400	27200	9200	10680	9700	13120	22200	24600	25200	21880	12160	9680
Chloride	mg/l	20409	21099	20494	14845	7368	16280	17250	18889	20019	16965	8592	7367
COD	mg/l	87.5	97.5	67.5	40	125	35	55	47.5	70	82.5	105	115

Table 2 Results of Leachate Quality (December 22, 1998)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	25.3	25.6	25.5	25.4	25.3	25.2	25.2	25.2	25.3	25.2	25.3	25.2
pH		6.98	6.91	6.98	6.96	7.14	7.06	7.14	7.22	7.43	6.93	7.42	7.26
E. Conductivity	µs/cm	41150	48400	42450	37600	26900	31450	32950	32750	42550	51600	34100	28750
TDS	mg/l	20550	24350	21300	18850	13450	15800	16500	16450	21250	25450	17050	14400
Chloride	mg/l	17959	20674	18144	16375	11137	13101	13576	13936	23438	17430	14106	12276
COD	mg/l	27.5	72.5	55	107.5	35	75	30	47.5	30	80	5	105

Note : The sampling date is indicated within parenthesis of the title.

Table 3 Results of Leachate Quality (December 30, 1998)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	23.6	23.7	23.8	23.8	23.8	23.9	23.9	23.9	23.9	24.0	24.0	24.1
pH		7.84	7.16	7.11	7.20	7.85	7.52	7.79	8.08	8.30	8.42	8.37	8.26
E. Conductivity	µs/cm	41850	47250	43000	37450	28050	32500	34250	32000	57400	45300	40100	39050
TDS	mg/l	20950	23700	21550	18750	14050	16300	17200	16050	28750	22650	20050	19600
Chloride	mg/l	15355	19499	18314	16055	11756	13346	14376	13961	25757	19694	15720	13966
COD	mg/l	65	80	42.5	62.5	60	30	72.5	67.5	57.5	35	37.5	15

Table 4 Results of Leachate Quality (January 05, 1998)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	26.9	27.2	27.3	27.1	27.2	27.3	27.3	27.0	27.0	27.0	26.9	26.9
pH		6.99	6.85	6.95	7.26	7.33	6.92	7.28	7.55	7.15	7.08	7.5	7.36
E. Conductivity	µs/cm	40750	46500	44200	38850	28950	32500	32850	32800	55800	37450	36750	39300
TDS	mg/l	20700	23150	21850	19200	14050	16000	16350	16250	27750	18550	19100	19550
Chloride	mg/l	18139	19279	18664	16980	12031	12496	12781	13266	22638	16390	16210	16130
COD	mg/l	70	32.5	155	142.5	157.5	135	145	125	175	180	175	62.5

Note : The sampling date is indicated within parenthesis of the title.

Table 5 Results of Leachate Quality (January 10, 1999)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	24.3	24.2	24.2	24.2	24.2	24.1	24.2	24.1	24.3	24.1	24.2	24.3
pH		7.58	7.31	7.19	7.51	7.52	7.27	7.62	7.65	7.32	7.31	7.39	8.05
E. Conductivity	µs/cm	39150	44100	45050	40300	28356	31800	30854	34150	54350	38256	37752	37950
TDS	mg/l	19508	21950	22450	20100	14150	15850	15400	17050	27150	19150	18560	19000
Chloride	mg/l	16245	18979	18679	41347	11921	12621	13306	13171	23288	15505	15762	15950
COD	mg/l	37.5	100	35	65	0	75	65	25	60	12.5	15	57.5

Table 6 Results of Leachate Quality (January 17, 1999)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	24.7	24.7	24.7	24.5	24.6	24.5	24.5	24.5	24.4	25.3	24.3	24.5
pH		8.07	7.88	7.65	7.96	7.90	7.71	7.95	8.0	7.87	7.83	8.05	8.27
E. Conductivity	µs/cm	39950	43400	43750	38600	27650	30300	29350	31550	54150	35650	39000	35350
TDS	mg/l	20000	21700	21950	19300	13900	15200	14750	15850	27150	17950	19550	17750
Chloride	mg/l	13336	15680	14755	12916	9392	12616	12826	14151	23293	17755	16650	17274
COD	mg/l	82.5	77.5	65	37.5	62.5	67.5	57.5	27.5	55	72.5	57.5	75

Note : The sampling date is indicated within parenthesis of the title.

Table 7 Results of Leachate Quality (January 24, 1999)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	23.8	23.7	23.6	23.6	23.6	23.6	23.6	23.6	23.8	23.8	23.8	23.8
pH		7.93	7.89	7.13	7.58	7.89	7.23	7.90	8.09	7.62	8.01	7.83	7.55
E. Conductivity	µs/cm	30856	40050	30250	37400	28450	30200	23150	25250	43550	36500	33850	37150
TDS	mg/l	15456	20000	15150	18650	14250	15100	11600	12656	21800	18250	16950	18550
Chloride	mg/l	11731	14091	10437	12366	9787	18282	7868	8362	14551	12361	12026	13291
COD	mg/l	60	70	60	112.5	80	85	80	72.5	100	100	67.5	77.5

Table 8 Results of Leachate Quality (January 31, 1999)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	23.0	23.1	23.5	23.4	23.5	23.5	23.6	23.6	23.6	23.7	23.6	23.6
pH		8.27	8.02	7.42	7.90	7.61	7.25	7.89	8.24	8.04	8.01	7.63	7.70
E. Conductivity	µs/cm	35750	44808	42300	35800	28500	30450	28650	29600	46850	36250	39250	39150
TDS	mg/l	18080	22450	21150	17900	14250	14250	14300	14750	23400	18050	19600	19550
Chloride	mg/l	16095	18659	18009	15410	11621	12366	11621	12396	20374	15780	15825	15715
COD	mg/l	12.5	42.5	32.5	5	56.5	35	7.5	2.5	5	22.5	2.5	5

Note : The sampling date is indicated within parenthesis of the title.

Table 9 Results of Leachate Quality (February 09, 1999)

PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	21.5	22.6	22.8	22.1	22.1	22.8	22.2	22.1	21.9	21.9	22.0	22.0
pH		7.8	7.9	7.4	8.2	7.5	7.8	7.5	7.8	7.7	8.2	8.1	7.7
E. Conductivity	µs/cm	38550	43850	45900	36950	37400	29050	31400	29350	31050	49250	37450	39400
TDS	mg/l	19600	21950	23050	18500	18800	14600	15800	14700	15600	24750	18750	19750
Chloride	mg/l	13046	15110	14366	12806	13171	9952	10797	9782	10797	16890	12276	13666
COD	mg/l	27.5	0	5	12.5	0	27.5	20	0	0	0	0	0

Table 10 Results of Leachate Quality (February 21, 1999)

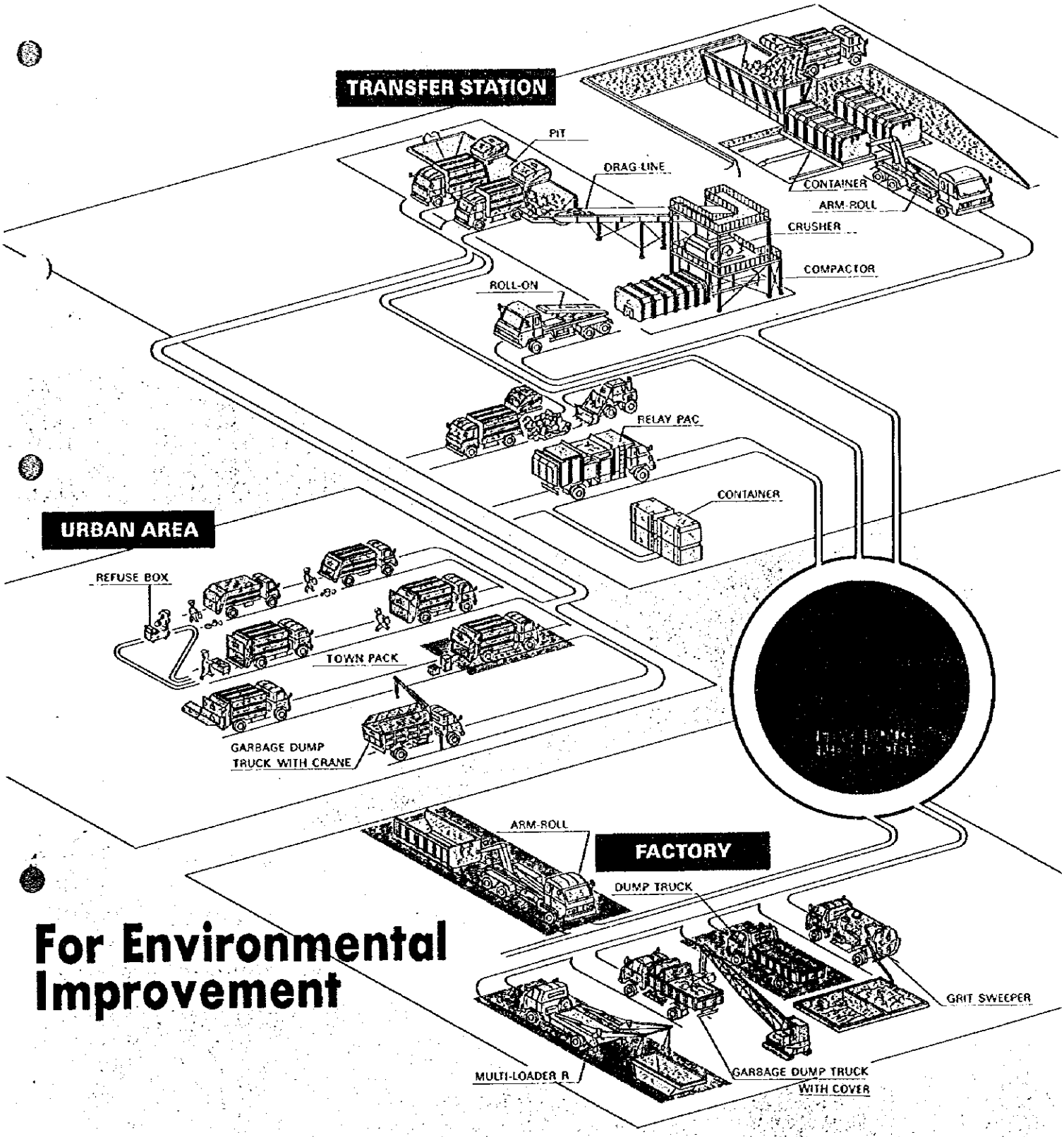
PARAMETERS	UNIT	A 1	A 2	A 3	A 4	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4
Temperature	°c	21.9	22.8	21.8	21.8	21.8	21.5	21.5	21.4	21.3	21.2	21.3	21.6
pH		7.8	6.9	7.0	7.3	7.2	7.1	7.2	7.3	7.3	7.2	7.3	7.2
E. Conductivity	µs/cm	38900	43650	44450	38950	30250	29550	30000	29950	49700	37700	42350	40750
TDS	mg/l	19350	21700	22150	19400	15100	14700	14950	14900	24700	18700	21000	20200
Chloride	mg/l	16835	20244	18814	13326	12526	12571	12161	12331	21138	14256	15445	16235
COD	mg/l	137.5	135	7.5	0	0	55	65	0	0	2.5	12.5	10

Note : The sampling date is indicated within parenthesis of the title.

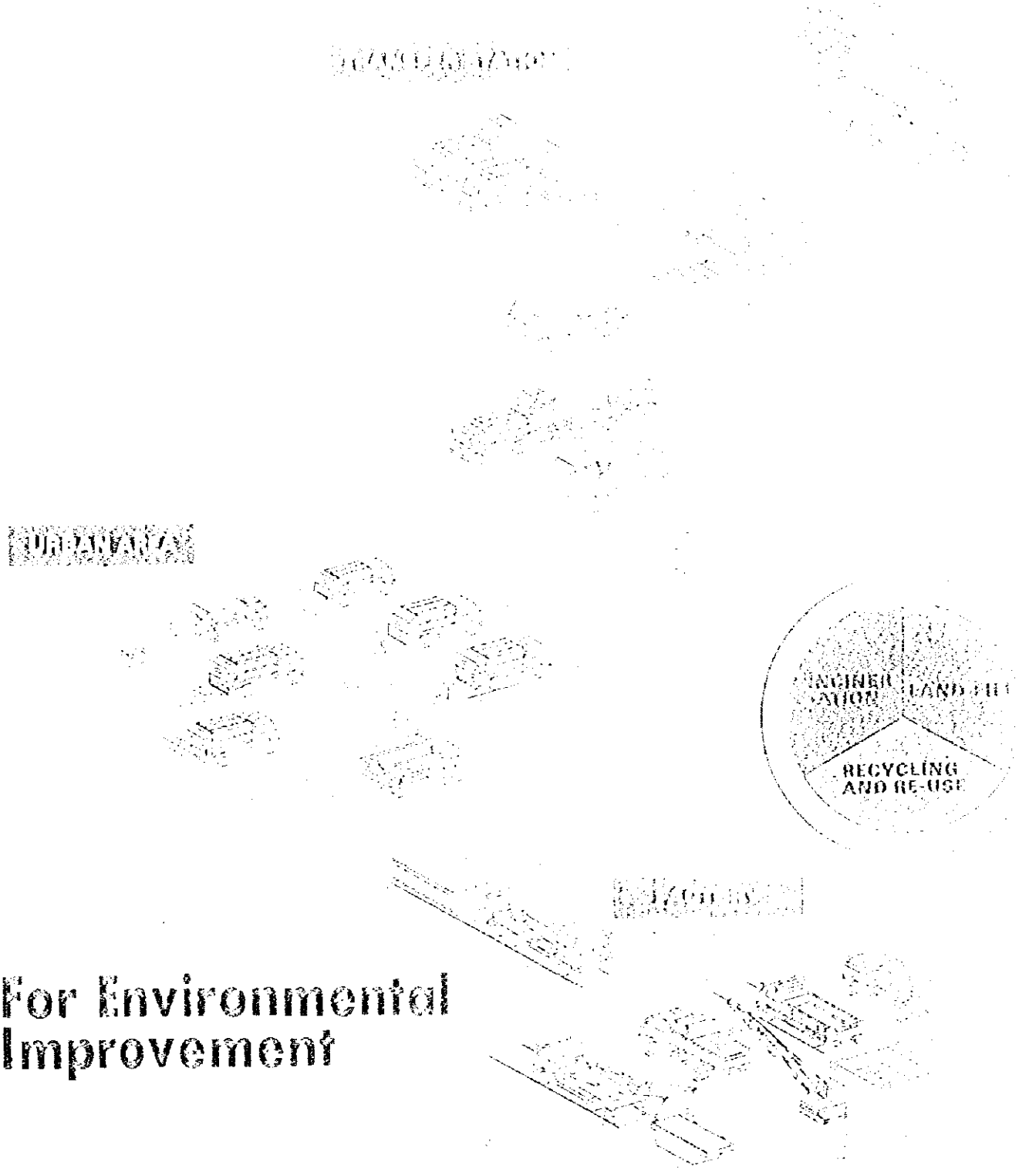
10. Information of

the Compactor Container System

Refuse Collection And Transportation System



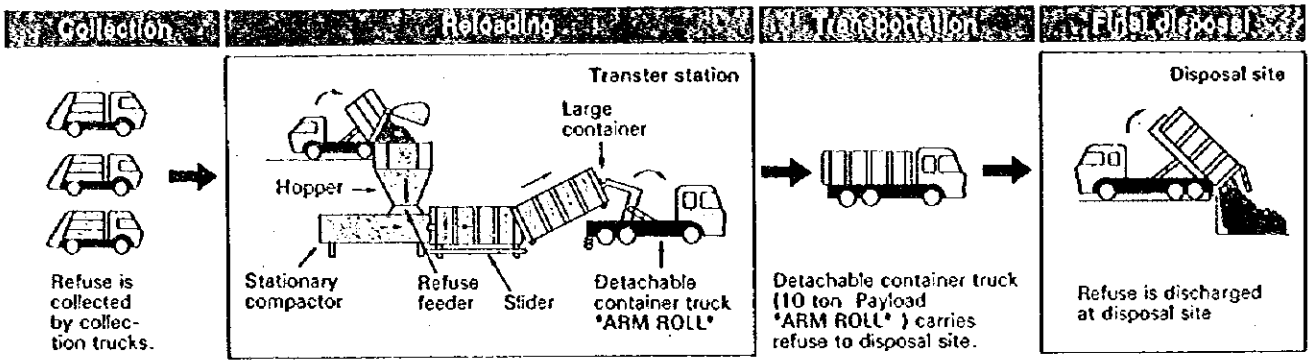
For Environmental Improvement



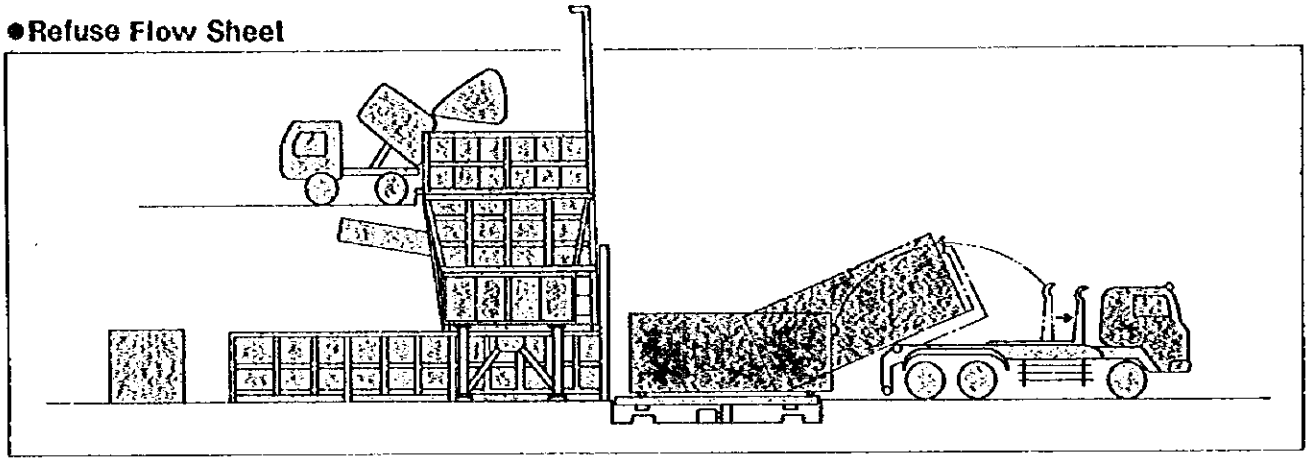
For Environmental Improvement

Refuse Transfer System

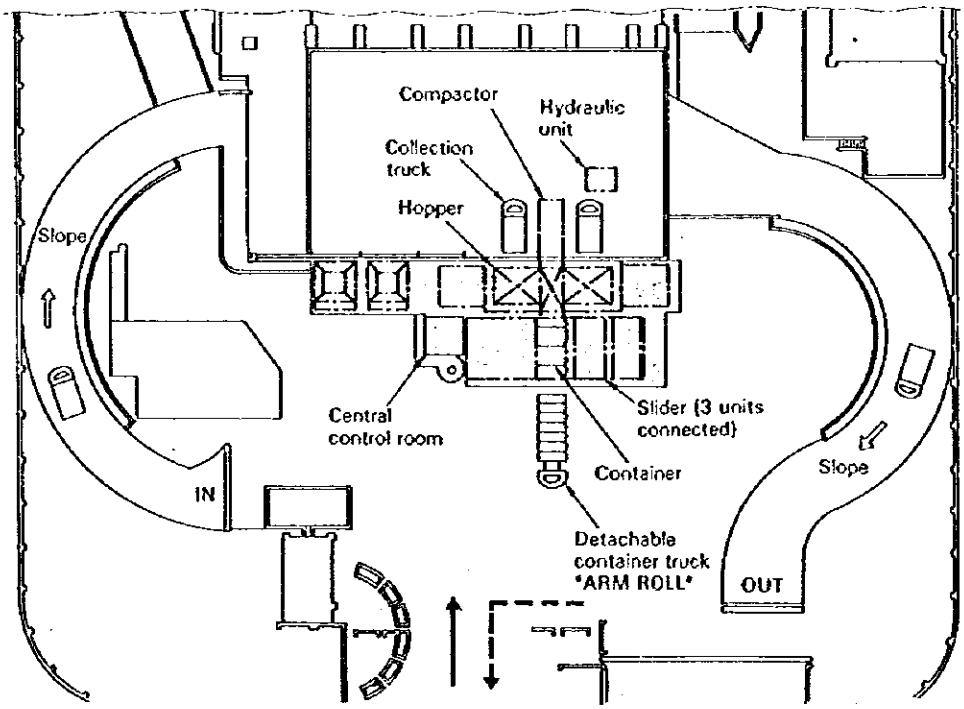
●Refuse Transfer Equipment



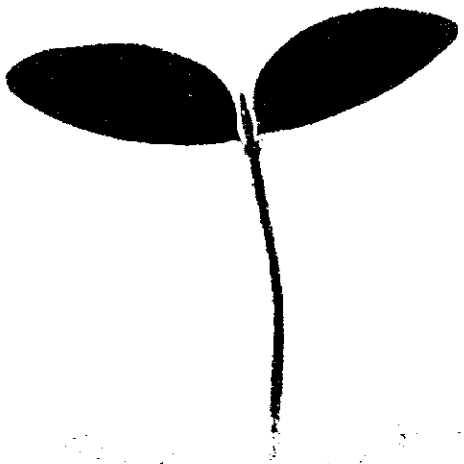
●Refuse Flow Sheet



●Layout



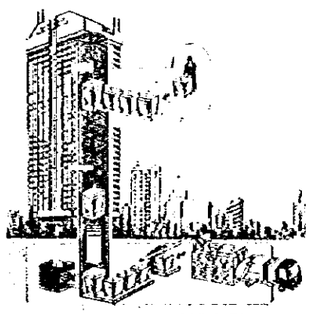
Integrated Wastes-Resources Recycling System



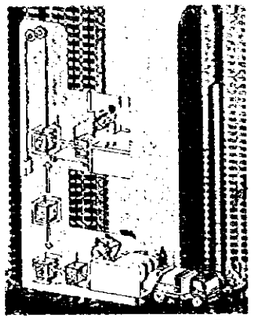
As an all-around planner, ShinMaywa designs an integrated waste disposal system that comprises all necessary processes from collection and separation of refuse to wastes-resources recycling.

Refuse Collection & Storage

For Office Buildings & Multistory Apartments

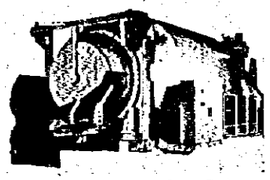


"AIRLIFT" Air-cushioned High Rise Refuse Transport System

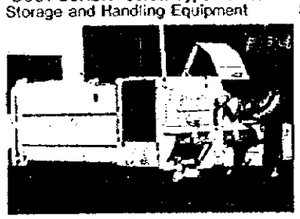


"CYCLE PORTER" Elevator Type Refuse Transport System

"DUST SCREW" Screw Type Refuse Storage and Handling Equipment



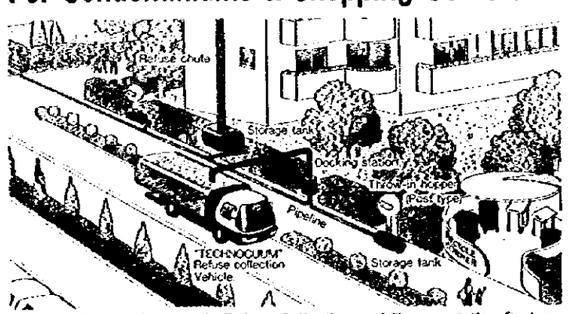
"DUST DRUM" Drum Type Refuse Storage and Handling Equipment



Refuse Storage Container with Compactor

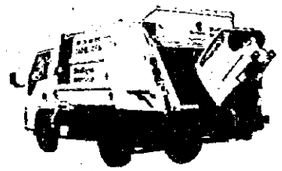
Inversive Charger (Dumper)

For Condominiums & Shopping Centers

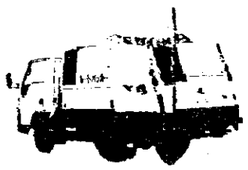


"TECHNOCUUM" Pneumatic Refuse Collection and Transportation System

Transportation Vehicles

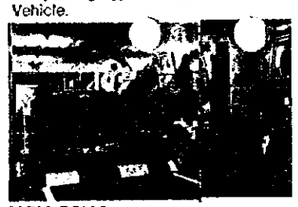


"TOWN PACK" Crushing and Compacting Type Refuse Collection Vehicle with Refuse Measuring Device



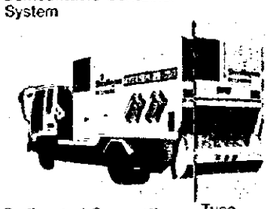
"ROUTE PACKER" Compacting Type Refuse Collection Vehicle.

"RECYCLE PACKER" Multi-chamber Separation and Classification Recyclables Collection Vehicle



"ARM-ROLL" Demountable Container System

"TECHNOCUUM" Vacuum Type Refuse Collection Vehicle



Sorting and Compacting Type Can Collection Vehicle.

Refuse Transfer Station System

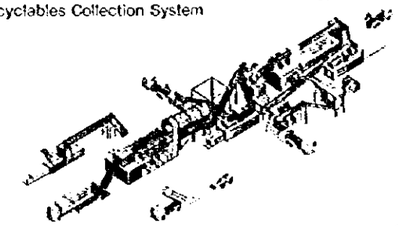
Isogo Refuse Transfer Station, Yokohama City

Refuse Relay Center, Ikoma City

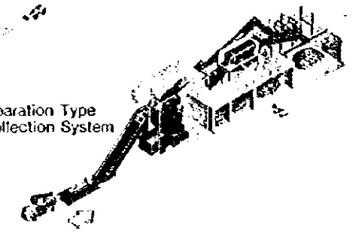
A Bird's-eye View of Refuse Relay Center, Ikoma

Wastes-Resources Recycling

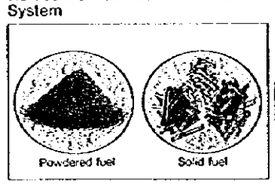
"TECHNOSORT" Non-destructive Separation Type Recyclables Collection System



Destructive Separation Type Recyclables Collection System



Refuse Derived Fuel Production System



Refuse Derived Fuel Fired Boiler System

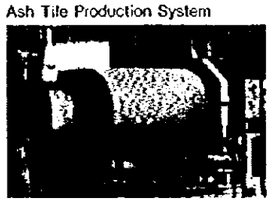
SM Fermentation(Fast Composting)System

Ferment Bacillus Feeder

Fermentation Rotary Drum

Scrap Wood Carbonizing System

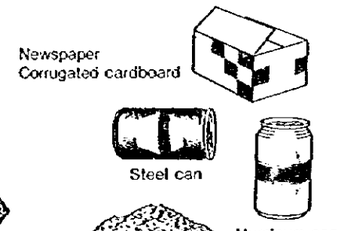
Ash Tile Production System

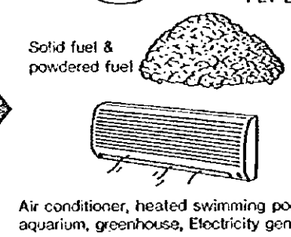


Rotary Dryer

Kiln

Recyclables

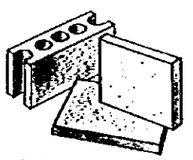




Air conditioner, heated swimming pool, aquarium, greenhouse, Electricity generation

Compost & livestock feed

Charcoal & wood vinegar



Building material (tile)

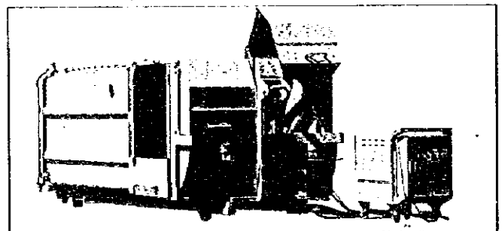
Building Refuse Storage and Handling System

Refuse is compacted and loaded into a storage container or a storage and handling equipment allowing either the whole container to be carried out by a refuse container transporter or the refuse to be in storage for direct transfer to a refuse collection vehicle for onward transportation. This system offers a highly efficient refuse disposal.

Refuse Storage Container with Compactor

Compacted refuse is kept in storage in an efficient manner. A necessity of life in the community of tomorrow and at such places like shopping plaza or department store.

Application
- Supermarket, department store, shopping center,hotel
- School, hospital, street of wholesale stores
- Bathing resort, campsite
- Public garden, amusement park
- Exhibition area, various events
- Office building, condominium, medium-size multistory apartment



Refuse storage container with compactor — Hydraulic unit

Operation Seguence

In-put Open inlet cover and input refuse into hopper.

Rolling back
Press refuse loading button to roll back push plate.

Descending
Slider starts to descend as soon as push plate has been rolled back.

Scraping
Push plate scrapes up refuse in hopper.

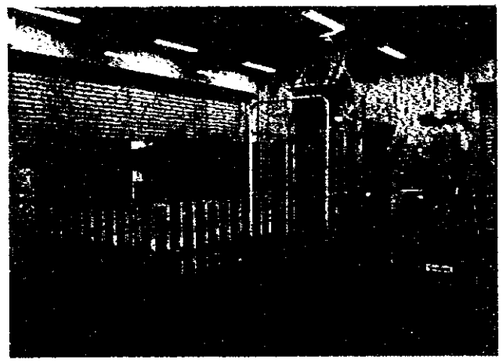
Loading
Slider ascends and then stops automatically in order to load refuse into storage container. Continuous operation is available.

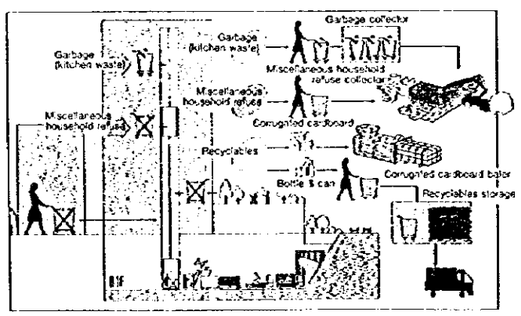
Specifications

Type	CNA7-53L	CNB7-53L
Overall length	3,960mm	
Overall width	2,040mm	
Overall height	1,680mm	
Container weight	1,670kg	
Refuse weight	2,080~2,330kg	
Gross weight	3,750~4,000kg(container and refuse weight)	
Container capacity	6.3m³	
Hopper capacity	0.5m³	

Refuse Storage Container with Compactor (SCC System)

Miscellaneous bulky refuse are fully compacted and loaded into a storage container with the volume substantially reduced. The whole container is then carried out by a refuse container transport equipped with "ARM-ROLL" demountable container system. This SCC system is a space-saver with highly efficient refuse disposal capability.



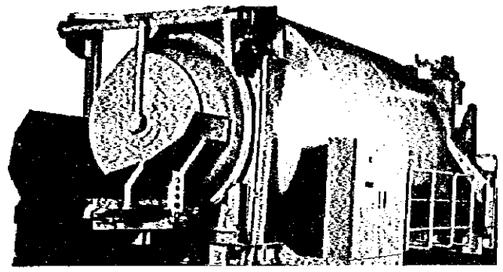


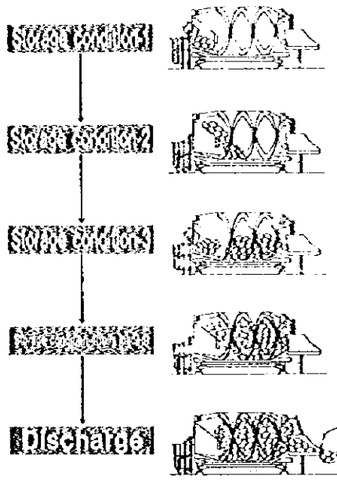
Specifications

Type		X8P12-51	X8P12-50	X8P17-50
Specifications	Method of compacting	Plate type	Plate type	Plate type
	Estimated processing capacity	24m³/h	24m³/h	45m³/h
	Motor output	7.5kW	7.5kW	11kW
	Squeezing rate	0.3tm³	0.27m³	0.65m³
	Gross weight	1.9t	1.8t	3.3t
Applicable container capacity		4~8m³	4~8m³	8m³

"DUST DRUM" Drum Type Refuse Storage and Handling Equipment

Refuse input by a inversive charger is compacted and densely loaded into the "DUST DRUM" by drum rotation with the volume substantially reduced. Totally enclosed watertight construction of the "DUST DRUM" completely prevents leakage of foul water. Just simply use the "DUST DRUM" to safely transfer refuse to a collection vehicle for onward transportation.
Refuse can be disposed of at any time regardless of the designated date of collection.





① Refuse is input by inversive charger (dumper)

② Input refuse is forced to move forward by drum rotation.

③ The inversive charger and drum rotation is repeated until fully loaded with refuse.

④ DUST DRUM has been fully loaded.

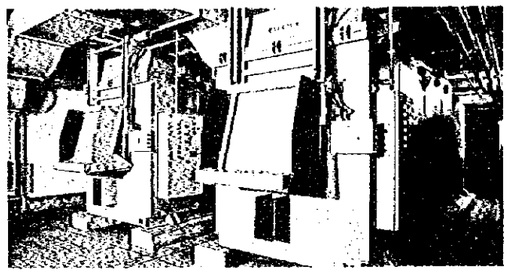
⑤ Refuse is transferred by drum rotation to refuse collection vehicle.

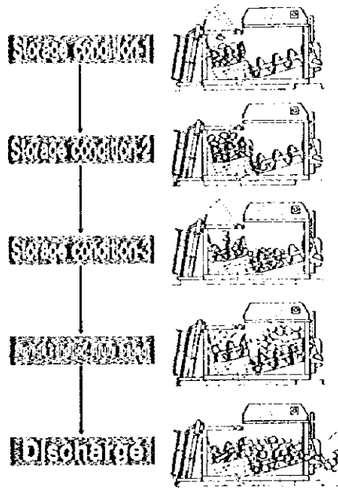
Type	XRF(Selected floor disposal type)							XR(Refuse chute type)		
Nonical capacity	6	8	10	12	14	16	18	10	22	24

(Unit : m³)

"DUST SCREW" Screw type Refuse Storage and Handling Equipment

Refuse input by a inversive charger is compacted and densely loaded into the "DUST SCREW" by screw rotation with the volume substantially reduced. Totally enclosed watertight construction of the "DUST SCREW" completely prevents leakage of foul water. Just simply press a push-button switch to operate the "DUST SCREW" and transfer refuse hygienically to a collection vehicle for onward transportation.





① Refuse is input by inversive charger (dumper)

② Input refuse is forced to move forward by automatic screw rotation that continues for a preset time.

③ The inversive charger and screw rotation is repeated until fully loaded with refuse.

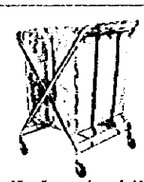
④ DUST SCREW has been fully loaded.

⑤ Refuse is transferred by screw rotation to refuse collection vehicle.

Type	XLF(Selected floor disposal type), XL(Refuse chute type)									
Nonical capacity	6	8	10	12	14	16	18	10	22	24

(Unit : m³)

Collectors (Bins)

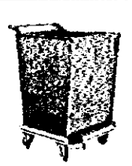


Miscellaneous household refuse collector

Capacity	0.2m³
Weight	Approx.12kg

Organic waste collector

Capacity	0.12m³
Weight	Approx.30kg



Bottle and can collector

Capacity	0.2m³
Weight	Approx.30kg

Recyclables cart (Polyethylene)

Capacity	0.15m³(190ℓ)
	0.13m³(130ℓ)

Recyclables cart (Polyethylene body)

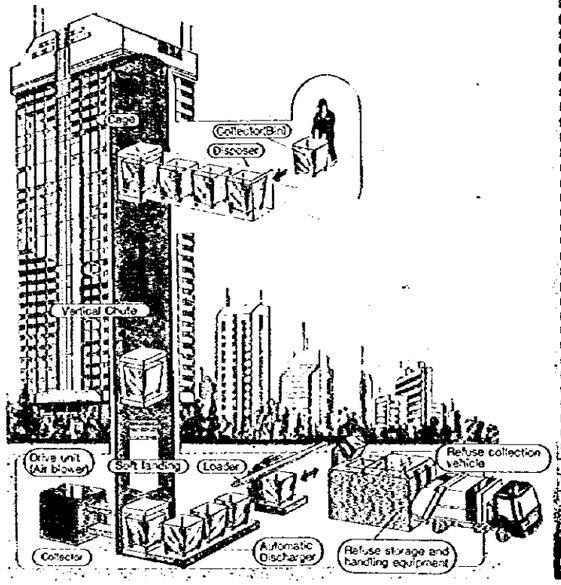
Capacity	0.6m³

Building & Condominium Refuse Handling System

Silent and very fast vertical-wise refuse transportation system which is originated by ShinMaywa. Available in two versions for use at high-rise buildings and condominiums where a pleasant and comfortable human life can be achieved.

"AIRLIFT" Air-cushioned High Rise Refuse Transport System

A dedicated collector (bin) filled with refuse is automatically carried vertically by a pneumatically controlled unmanned lift at high speed. A system with the inconspicuous amenities.



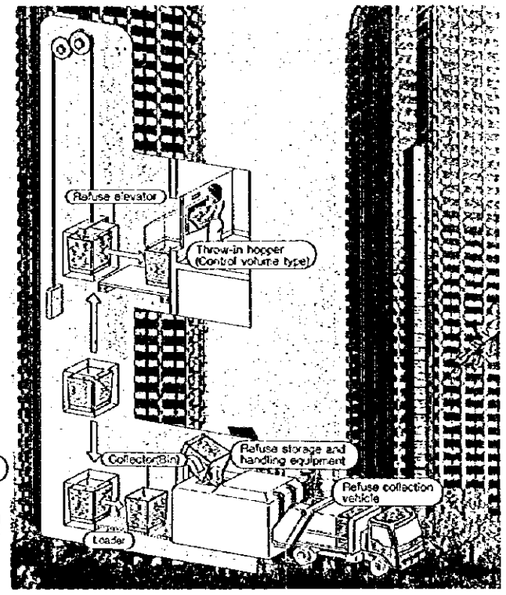
■Specifications

Vertical chute	900×900mm
Collector (Bin) size	625×625×915mm
Collector (Bin) weight	35kg
Collector (Bin) capacity	200 ℓ
Maximum refuse weight	50kg
Cage size	865×865×1600mm

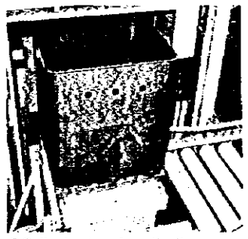
Cage weight	60kg
Descending speed	5m/sec
Ascending speed	1.5m/sec
Control air volume	100m³/min
Drive unit (Air blower)	Approx.15kW
Method of control	Automatic operation by sequential controller

"CYCLE PORTER" Elevator Type Refuse Transport System

A collector filled with refuse is automatically carried up and down by a dedicated elevator at high speed. A system that substantially reduces the time to move the refuse downstairs for disposal.



●Refuse is input to collector through throw-in hopper by residents or personnel in charge of collection.



●Collector is automatically mounted onto the dedicated elevator and goes up and down as necessary to the calling floor.

■Specifications

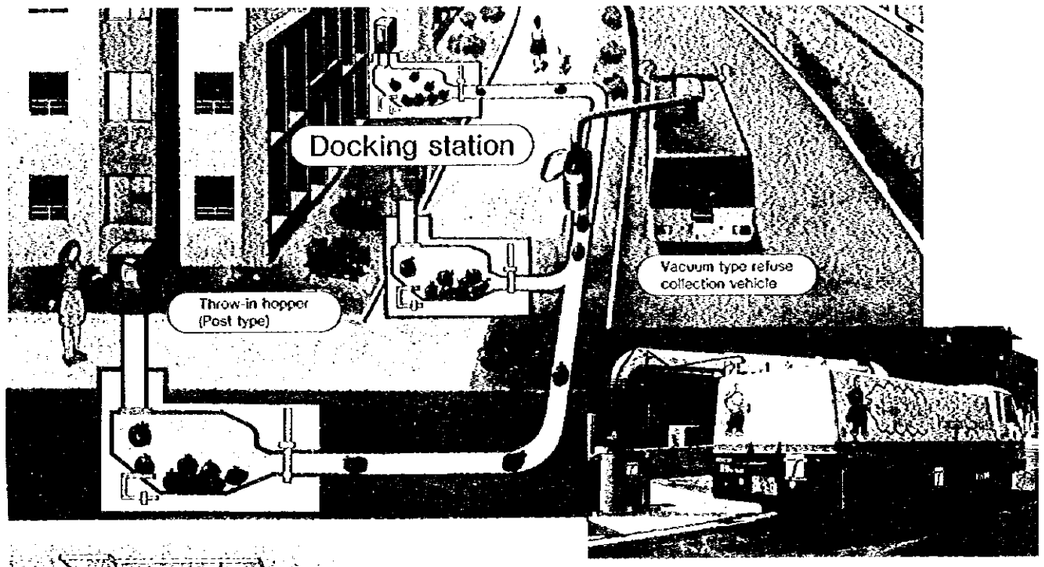
Elevator	Load capacity	300kg
	Speed	60m/min
	Method of control	Inverter control
	Dedicated collector elevator size	1,000×1,000×1,500mm
	Motor	7.5kW
Each floor disposal type	Disposal opening	Capacity : 30 ℓ (fixed volume)
	Collector (Bin) capacity	400 ℓ
	Collector (Bin) size	700×700×850mm

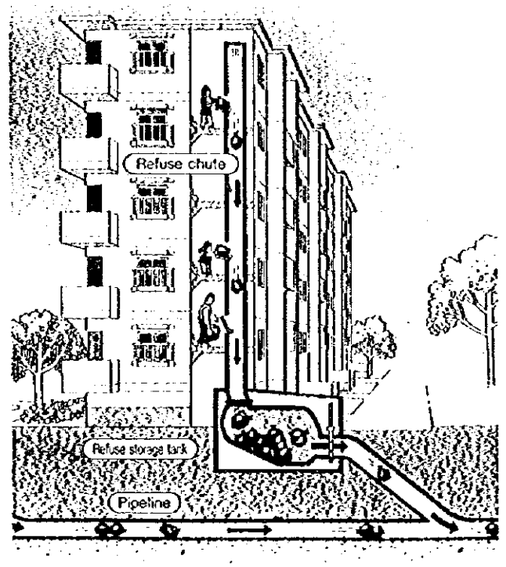
Pneumatic Refuse Collection and Transportation System

An innovative refuse collecting system with vacuum type refuse collection vehicle originated by ShinMaywa. A desire that refuse can be disposed of at any time and moreover the residential areas are thoroughly free from piles of refuse which are completely realized by ShinMaywa.

"TECHNOCUUM" Refuse Collecting and Transporting System

Refuse can be disposed of by residents at any time through a refuse chute or outdoor post type throw-in hopper regardless of the designated date of collection.
The refuse in storage in an underground storage tank is pneumatically transferred to "TECHNOCUUM" Vacuum type refuse collection vehicle by vacuum power.
Totally enclosed construction of the "TECHNOCUUM" satisfactorily prevents emission of foul odour.





●Refuse Chute

Size	400mm dia.
Throw-in hopper	Size : 250mm×200mm
	Material : stainless steel
	Control volume type

●Docking station

Size	W750mm×D480mm×Ht,154mm(When opened) Ht,074mm(When closed)

●Refuse storage tank

Capacity	Vertical type	0.2 m³~1.0 m³
	Horizontal type	1.0 m³~2.0 m³
	Dust Screw type	4.0 m³~16.0 m³
Components		In-let gate, Discharge gate, Air intake, Silencer

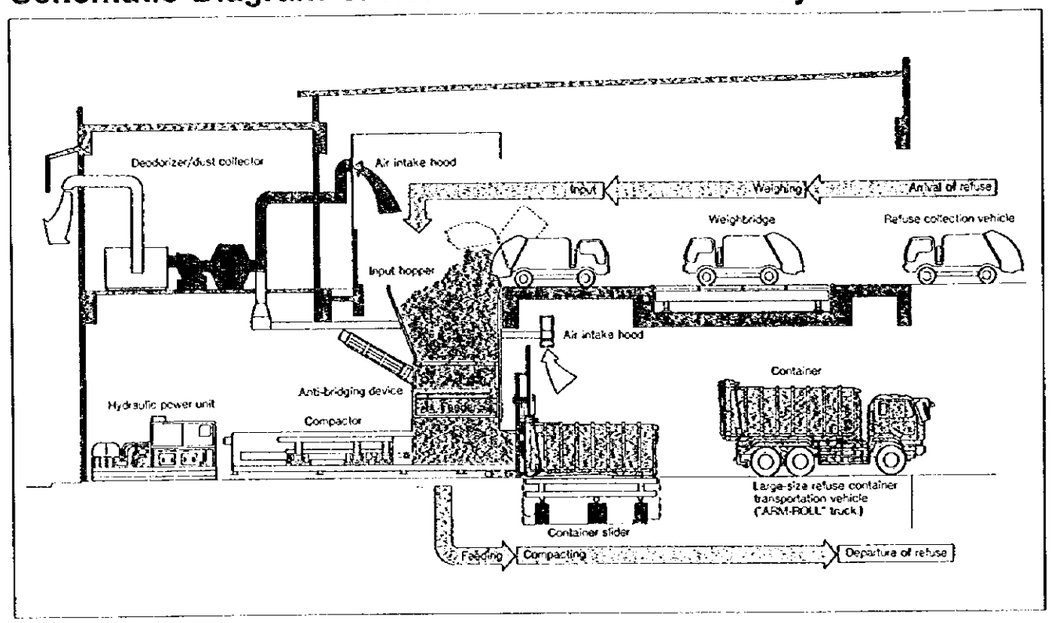
●Pipeline

Pipe diameter	250mm	300mm
Max. pipe length	450m	500m
Max. conveying distance	350m	400m

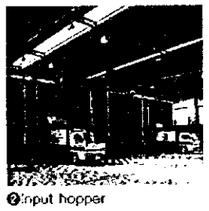
Refuse Transfer Station System

Refuse is first collected by a number of refuse collection vehicles and then transferred to a large-size refuse container transporter at a refuse transfer station for efficient onward transportation.

Schematic Diagram of Refuse Transfer Station System



❶Weighbridge
to measure in-coming refuse

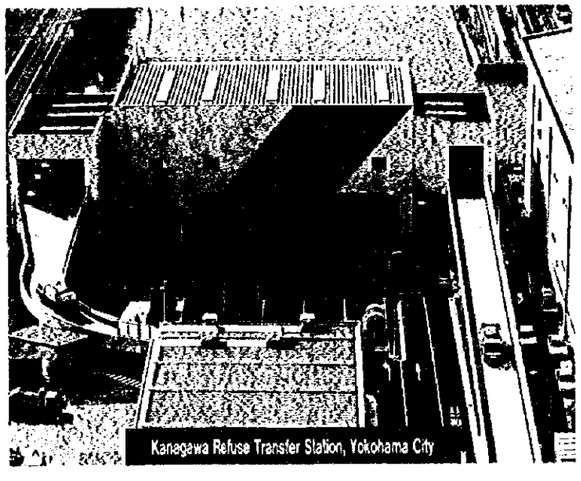


❷Input hopper

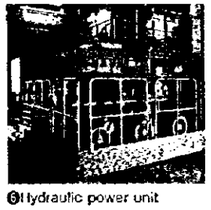
❸Deodorizing & scrubber equipment
to remove odour from refuse

❹Compactor
to compact refuse and densely load it into container

❺Container Slider
to efficiently and automatically transfer container



Kanagawa Refuse Transfer Station, Yokohama City



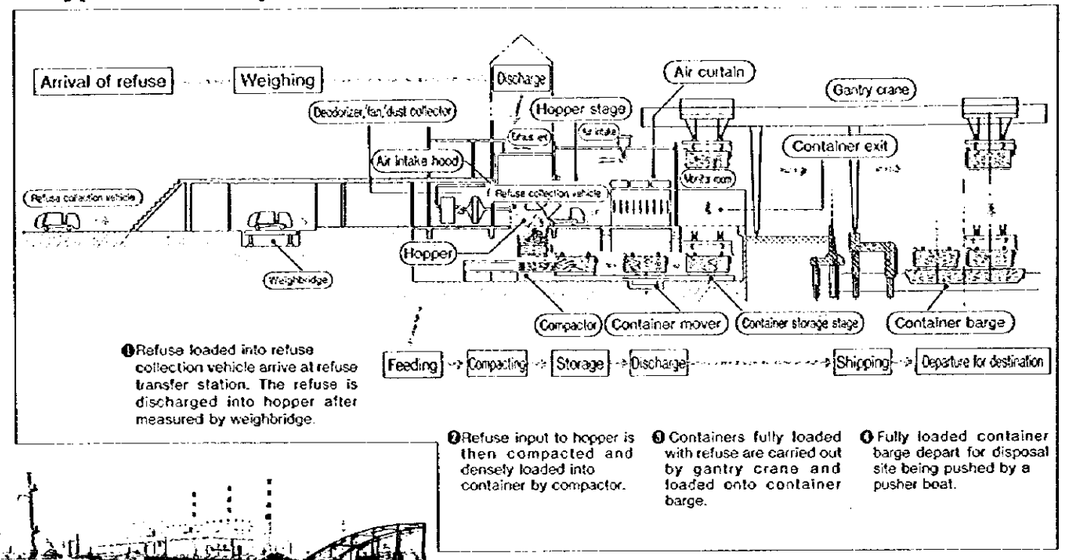
❻Hydraulic power unit

❼Cleaning device
to wash off refuse stuck to container tailgate

❽Large-size refuse container transportation vehicle

❾Central control room
to control and check the system

A typical example of refuse transportation by a container barge



❶Refuse loaded into refuse collection vehicle arrive at refuse transfer station. The refuse is discharged into hopper after measured by weighbridge.

❷Refuse input to hopper is then compacted and densely loaded into container by compactor.

❸Containers fully loaded with refuse are carried out by gantry crane and loaded onto container barge.

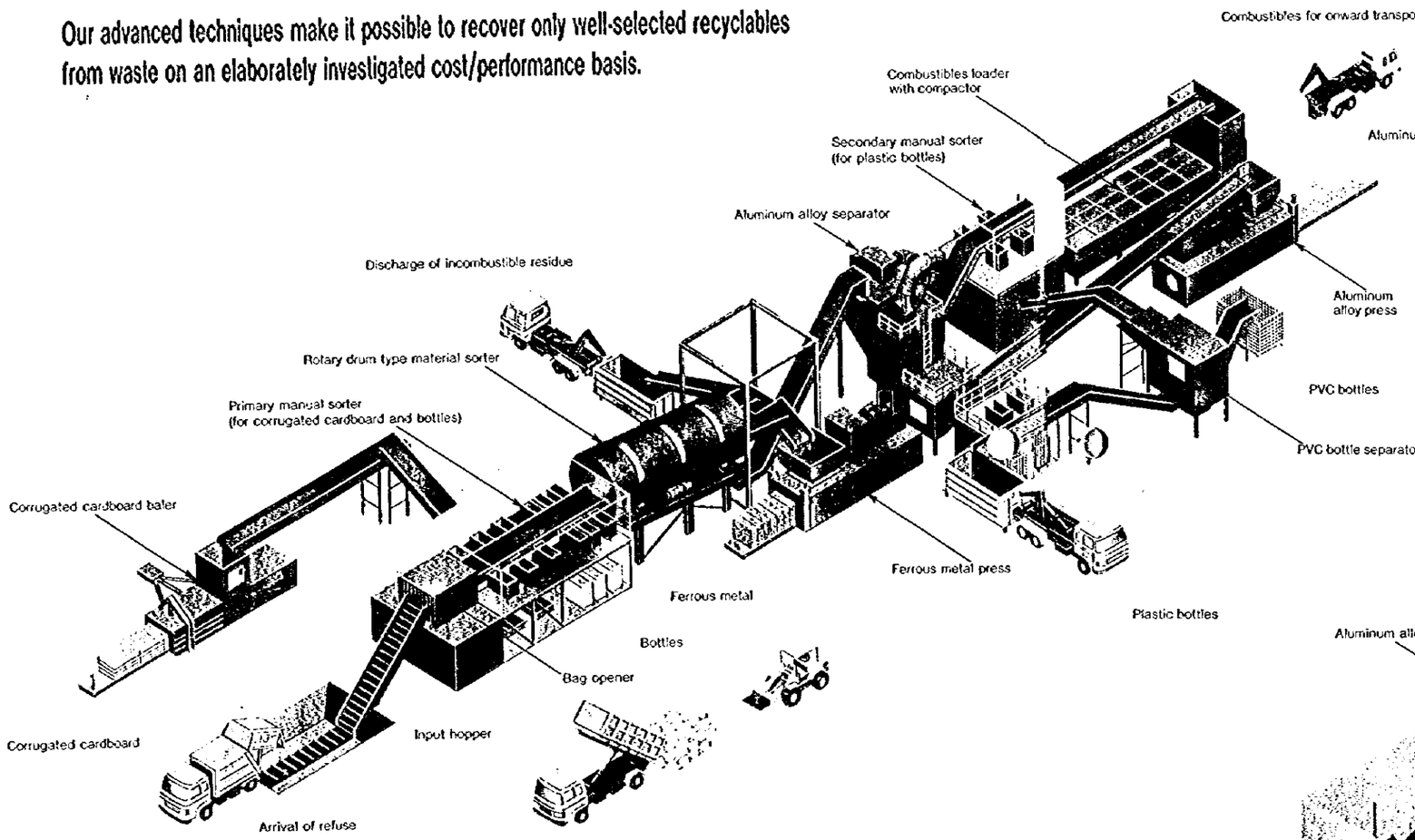
❹Fully loaded container barge depart for disposal site being pushed by a pusher boat.

Higashi Shinagawa Refuse Transfer Station, Tokyo

Refuse Relay Center, Ikoma City

"TECHNOSORT" Non-destructive separation type recyclables collecting system

Our advanced techniques make it possible to recover only well-selected recyclables from waste on an elaborately investigated cost/performance basis.



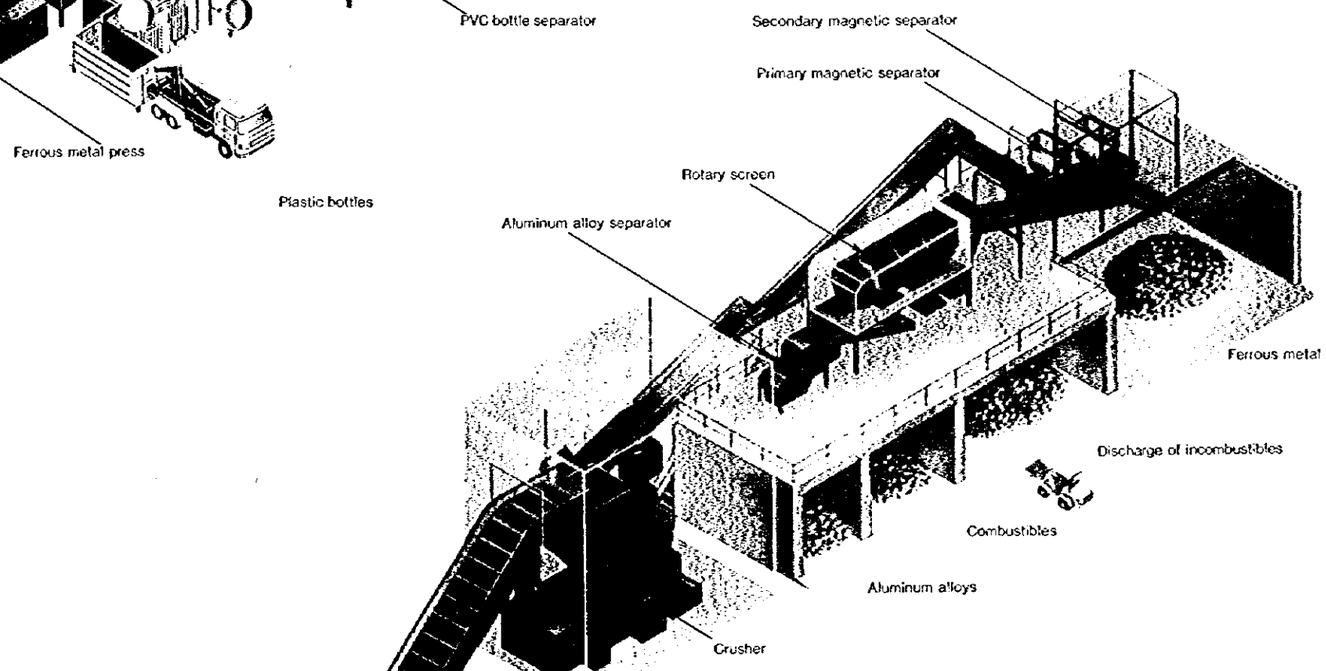
A variety of usable materials still contained in household refuse and non-industrial waste that should be recycled to recover resources. Nonetheless, the old style recyclables separation and collection work has been carried out very inefficiently in an unsatisfactory working environment to date.
This is because such time-consuming work has been done only manually.
A good combination of manual and automatic sorting process used in our "TECHNOSORT" Non-destructive separation type recyclables collecting system makes it possible to efficiently recover usable materials from waste in a very favorable working environment with the collecting rate/quality/operation costs well balanced among them.
This system offers an elaborate method of collecting usable materials at a low cost thus facilitating wastes-resources recycling.

(Features)

- Processing capacity is 20 ton/hour. Highly purified usable materials are recovered at an excellent collection rate thereby increasing the utility value.
- Combustible or noncombustible dried wastes which are not in need of being crushed beforehand are suitably applicable to this system.
- The environmental impact such as emission of noise or dust are reduced because this system is a non-destructive type.
- A combination of manual and automatic sorting process makes it possible to substantially reduce energy consumption.
- Each equipment used in this system has a long-standing proven record of operation in the industry.
- It is possible to design an all-round integrated system to fully meet the plant and equipment investment plan taking into account each required working process in detail.

Destructive separation type recyclables collecting system

Hard-to-handle bulky wastes are crushed into pieces for smooth collection of quality metal resources.



In this system, bulky wastes like furniture, household electric appliances, bicycles, etc. that are usually difficult to break up in a minute are immediately crushed into pieces thereby facilitating efficient collection of metal resources.
Our destructive separation type recyclables collecting system is a fully automatic system that consists of a compact vertical-wise operating crusher and a rotary screen, a long-standing proven combination widely used in the scrap metal recycling industry.
The crusher is also easy to inspect and maintain, especially regarding wear of the mechanism, the most important point for long-time and stable operation of the machine, and moreover easy to set up the grain size of the materials to be crushed to a predetermined size.

(Features)

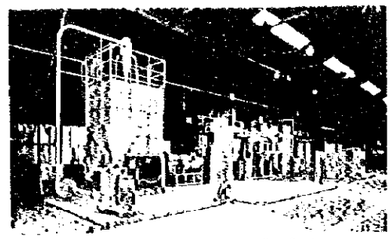
- Since the bottom section of the vertical-wise crusher is cone-shaped, crushed materials have a high bulk density and uniform grain size thereby effectively facilitate wastes-resources recycling.
- A rotary screen with appropriate meshes is included in the system in order to more efficiently separate ferrous metal, aluminum alloys, combustibles and noncombustibles from waste.
- Aluminum alloys are properly collected in this system by the use of the eddy current magnetic field.

Refuse Derived Fuel Production System/Refuse Derived Fuel Fired Boiler System

Combustible refuse can be turned into fuel. A dedicated boiler is used to burn the derived fuel and effectively recover heat.

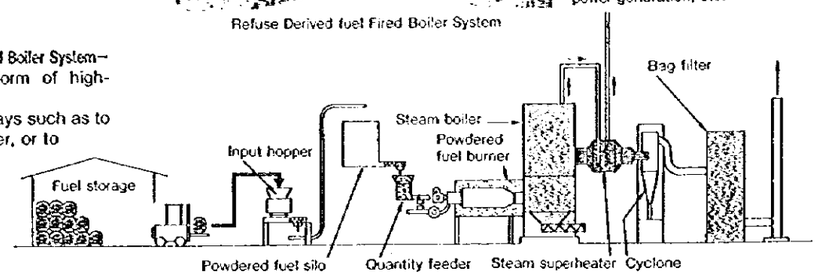
To date, most combustible refuse has been incinerated into ashes with the energy seldom recovered in the incineration process.
Our refuse derived fuel production system/ refuse derived fuel fired boiler system first produces powdered or solid RDF (Refuse Derived Fuel) from combustible refuse which can be stored for further burning as fuel effectively to recover the heat. This system is intended to serve as a new energy source of tomorrow.
A compact, dedicated powdered-fuel fired boiler is exclusively used to burn the powdered RDF. In this case, the most efficient heat recovery rate is available.

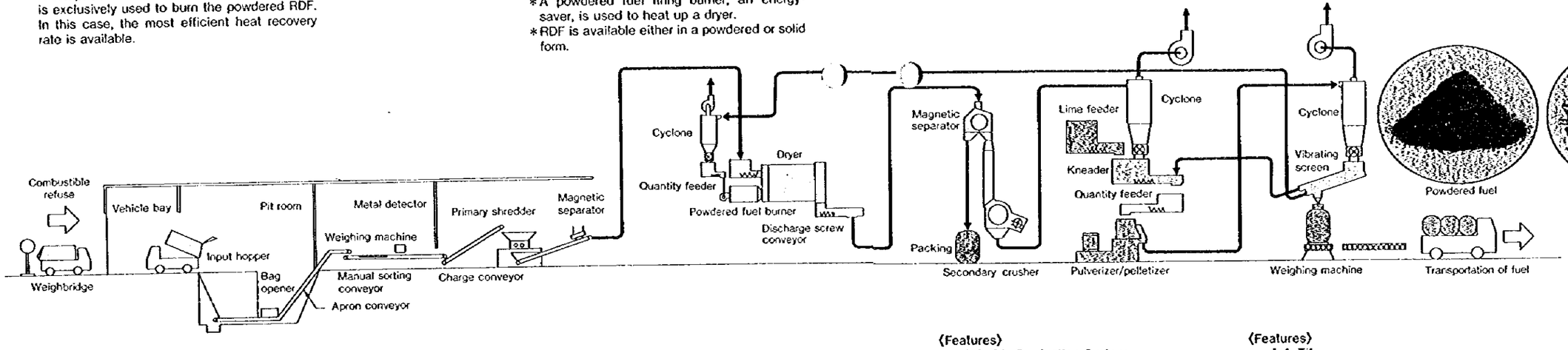
(Features)
—Refuse Derived Fuel Production System—
* Combustible refuse including garbage is turned into powdered or solid fuel to fully meet intended uses or purposes.
* Lime is added to the RDF to remove chlorine from it and moreover reduce the combustion load imposed on the dedicated RDF-fired boiler. In addition, since the lime has an effect on preventing decomposition, the RDF containing the lime can be stored for a long time.
* A powdered fuel firing burner, an energy-saver, is used to heat up a dryer.
* RDF is available either in a powdered or solid form.



Refuse Derived fuel Fired Boiler System

(Features)
—Refuse Derived (Powdered) Fuel Fired Boiler System—
* Energy is recovered in the form of high-pressure steam.
* This system is used in many ways such as to supply process steam, hot water, or to generate power.
* A compact, dedicated powdered-RDF-firing burner is used to increase efficiency of the system.



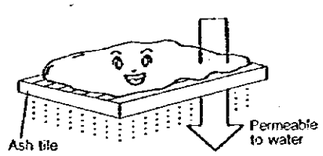


Ash Tile Production System

Incinerated ashes and slags, merely dumped in the past at landfill site, have been turned into colorful tiles for a wide variety of uses.

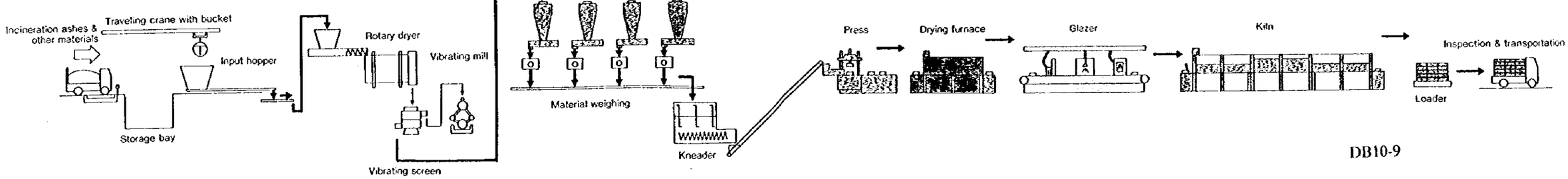
Hard-to-handle municipal refuse and sludge incineration ashes have caused many problems concerning the intended longer use of the existing landfill sites and moreover conversion of them to harmless places.
Our ash tile production system utilizes the limited resources more effectively by producing a new type of building materials like ash tile by mainly using such ashes.
The basic production process of the system is almost the same as that of an ordinary tile production system except that this system features a new pretreatment, mixing ratio and continuous burning so that incineration ashes and industrial waste (sludge, casting, metal, glass, etc.) are suitably used for this system.

(Features)
—Ash Tile Production System—
* Only such wastes as ash, slag, glass and a small amount of clay are used for tile materials.
* Tiles with less burning shrinkage and with accurate dimensions are produced at a low cost.
* Materials with high moisture content such as sieved sludge or quarry sludge can be used directly.



(Features)
—Ash Tile—
* Colors and sizes are at customer's needs.
* Bending and compressive strength are equal to concrete products.
* With its porous structure permeable to water, the tile hardly allows rainwater to gather on it. Yet, on the other hand, the tile has a water holding property and by making good use of it, an anti-slip pavement can be constructed thus contributing to a certain extent toward preventing the global temperature rise.
* The tile is easy to install because it is large in size ; available either in 300×300mm or 500×500mm.

(Usable Materials)
* Municipal refuse incineration ash, sludge incineration ash, glass pieces, blast furnace slag, molten slag, china chips, concrete rubbish, volcanic ash, waste casting sand, and other types of incineration ashes.

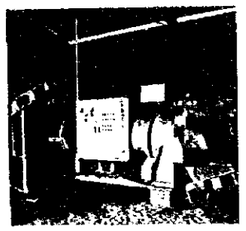


SM Fermentation (Fast Composting) System

"Bacillon Z" changes organic waste into odorless, quality compost and livestock feed in the process of high-temperature aerobic fermentation.

Composting System

Our SM fermentation (fast composting) system changes organic waste such as meal leftover, waste vegetables, bony parts of raw fish into odourless, quality compost. A fermentation rotary drum (bio-drum) is used in the system to change the waste materials into fully matured, odourless, quality compost containing only a small amount of impurities through the high-temperature aerobic fermentation derived from our unique function of the rotary drum, with several kinds of bacilli complex, the Bacillon Z, added to the materials.



〈Features〉

* Since foreign matter are removed from the fermented product (compost) by using a rotary screen after the compost has fully been matured, only a smaller amount of impurities are contained in the compost.
* A high-temperature fermentation condition is soon achieved in the heated aerobic fermentation system. Accordingly, emission of odour often found in the anaerobic fermentation hardly takes place.
* A high-temperature fermentation has sterilizing and decomposing power by itself thus producing fully matured compost of high quality almost always.

〈Matured Compost〉

The fully matured compost is such that organic substances contained in it are no longer harmful to the crops.
The field soil over which fully matured compost is applied allows for a growth of those organisms which take the compost as their nutrient. These microorganisms act to nodulize the soil and to drain water well while holding it well. The pores formed in the process of nodulization serve as a heat insulator. As a result, the compost makes a cultivation field highly resistant to a dry and/or cold weather. And it continues working on crops for a long period.

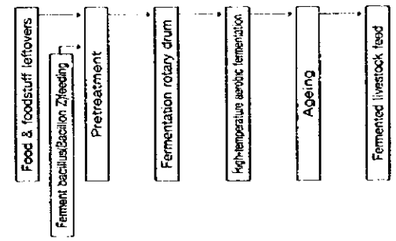
〈Bacillon Z〉

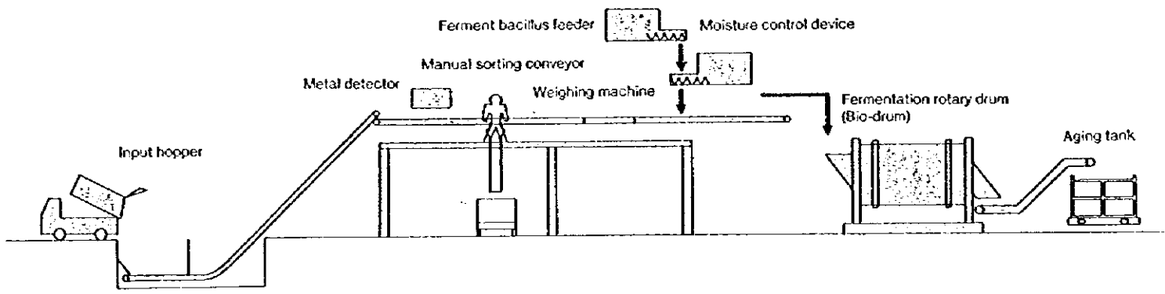
Bacillon Z consists of five kinds of high-temperature-favorite aerobic bacilli taken out from the field soil by ShinMaywa staff in a research and development project carried out under the guidance of Prof. S. Sakai and Y. Kubota of ShinShu University. These five kinds of bacteria, the bacilli according to the Bergey's classification, dramatically promote fermentation of the organic matter and therefore we named it "Bacillon Z." The Bacillon Z is available in powdered form that allows for storage for a long time.

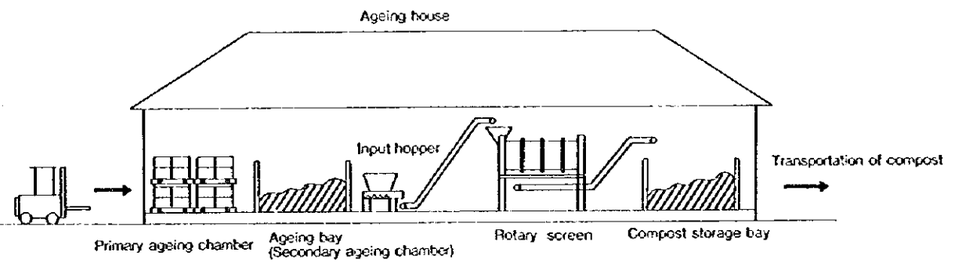
Livestock Feed Production System

Livestock or pet feed has been produced from food and foodstuff leftover in the process of high-temperature fermentation completed by us based on our unique know-how acquired in our development stage of the system.
The fermented feed decomposed at a high temperature is especially digestible thus making livestock or pet droppings less smelly.

〈Livestock Feed Production Process〉







Scrap wood carbonizing System

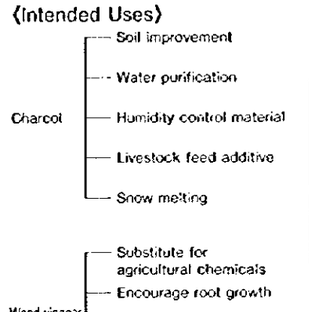
Waste or unused timber and wood has been turned into charcoal almost instantaneously in this economical self-burning system.

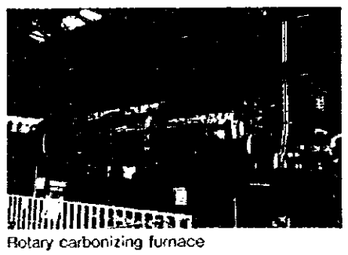
Waste or unused timber and wood produced from a building construction site, wooden crates, lumber mill waste, thinnings, drift timber and wood or the like are mostly burnt or merely dumped at a landfill site to date.
Our scrap wood carbonizing system enables us to recover resources from scrap wood in the form of quality charcoal and wood vinegar through an extraction process.
At present, superior characteristics of the charcoal are reconsidered again in such sectors as soil improvement, water purification, humidity control material, etc.

〈Features〉

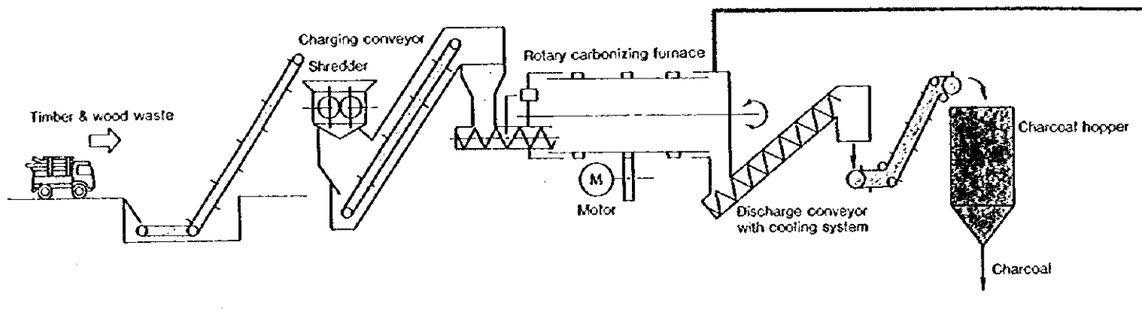
* A rotary type carbonizing system produces quality charcoal at high speed. This is because the wood chips are heated uniformly and rapidly in the furnace.
* Using an economical self-burning system, this system is a fuel-saver.
* Easy to operate. Only manual setting of carbonizing time and temperature starts the subsequent automatic control of the system and then stable production of quality charcoal.
* This system can be operated continuously or intermittently as necessary so that any kind of timber and wood waste can be used for materials.
* In addition to the timber and wood waste, it is also possible to use fowl droppings, bean-curd refuse, coffee grounds, and the like.

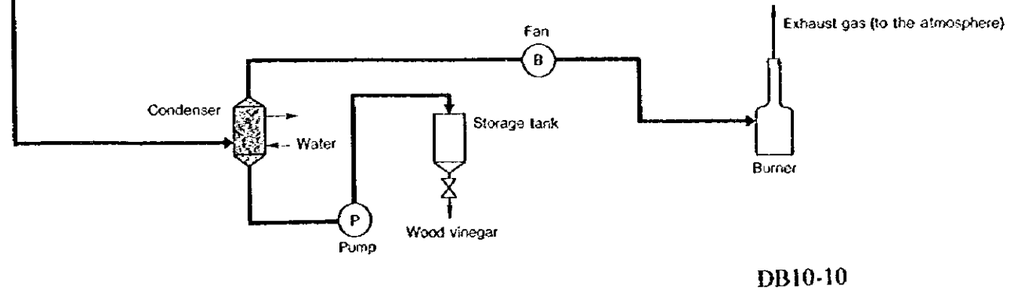
〈Intended Uses〉

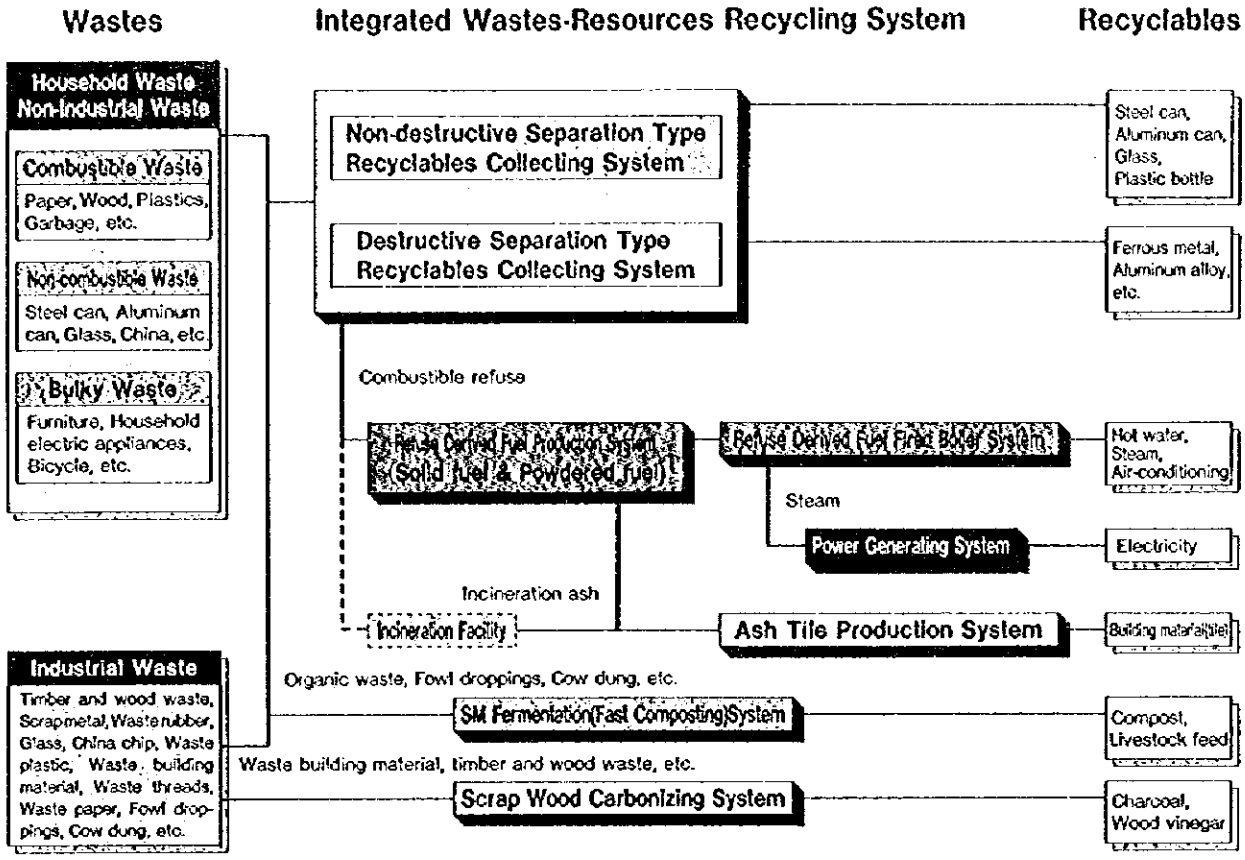




Rotary carbonizing furnace



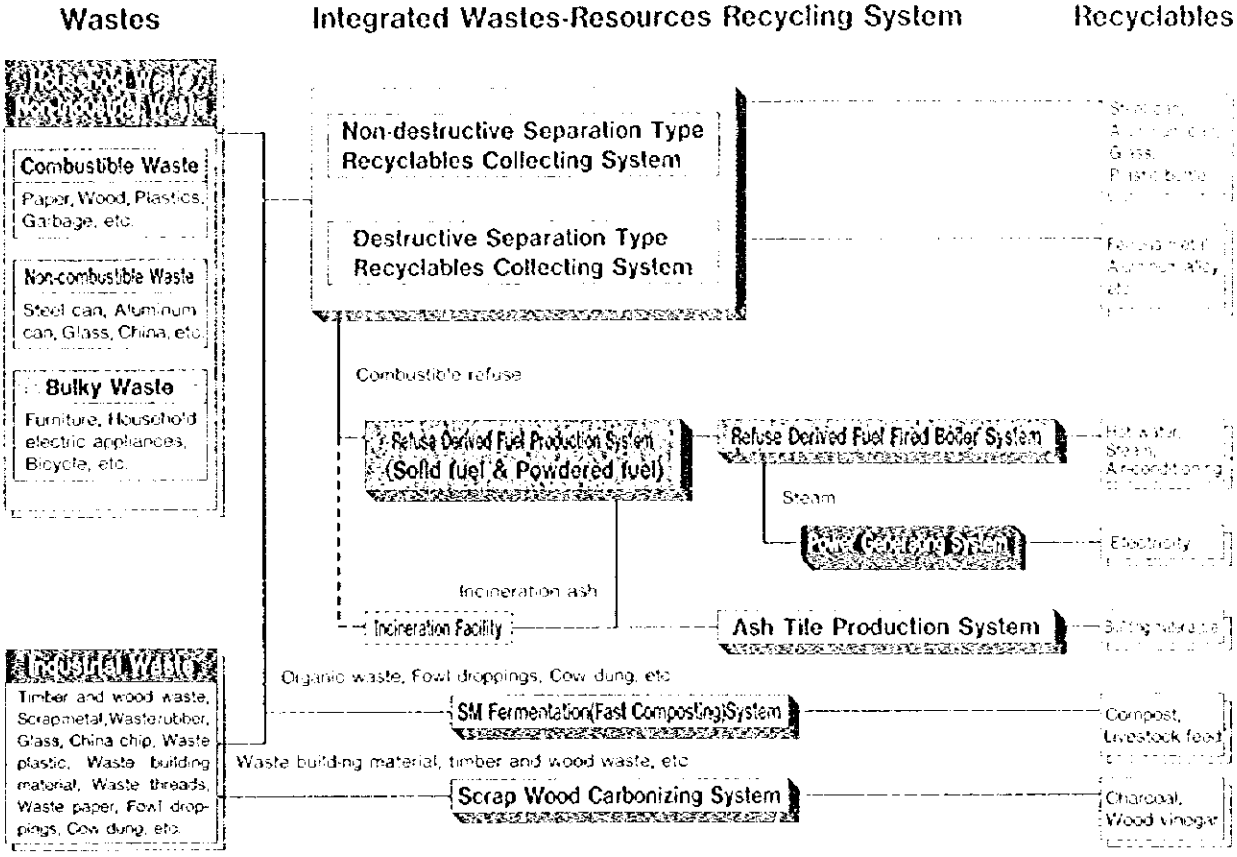




As a company dedicated to shaping the living environment of the future, ShinMaywa has been developing our innovative human- and society-friendly technology in terms of the waste disposal system, water treatment system, parking system, and others.

Based on the know-how acquired in such processes, we have recently established an all-around integrated system that comprises all necessary refuse disposal processes from collection and separation to wastes-resources recycling.

Customer's satisfaction is always the crucial key for us. And in the light of achieving a bright, harmonious and prosperous future and society, the environmental impacts should be reduced to the minimum. This is why our system to produce valuable resources from wastes which is highly recommended.



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