

Mapping Solid Waste – IV

Municipal Solid Waste



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Presentation Outline

- ❖ Designing Survey for MSW
- ❖ Residential Hazardous Waste



Required Information

1. Geographic and administration boundaries are defined and land use maps are ready with information on residential, commercial, industrial and other zones.
2. The decisions on geographical coverage and type of waste that is considered as municipal solid waste. Usually, residential and non-hazardous commercial waste is considered as municipal waste. However, if there are other sectors or types of wastes, to be considered as municipal solid waste, then those should be included in the survey.
3. The primary information on the waste transfer stations, transportation, and final disposal would be required to design the survey and to identify the sites for the collection of samples.



List of Districts & Streets

District / County	A	B	C	D
Zoning	Residential	Residential & Commercial	Industrial	Residential
Counties / Streets	A1, A2, A3...	B1, B2, B3...	C1, C2, C3...	D1, D2, D3...

A,B,C,D will be replaced with the real district/county names and subsequently A1,A2,.. will be replaced with the street names within each district or county



Marking Waste Collection Points / Vehicles

District/County	A (A1)	A (A3)	B (B2)	B (B4)	C (C1)	C (C3)	D (D2)
Collection site	1, 2, 3	4, 5, 6, 7	8, 9	10, 11	12, 13	14, 15	16, 17, 18
Disposal site & vehicles	I 1, 2,3,4	5, 6, 7, 8	9, 10	II 11, 12	13, 14	III 15, 16	17, 18, 19, 20

A,B,C,D will be replaced with the real district/county names and subsequently A1,A2,.. will be replaced with the street names within each district or county, and each primary collection site at generation or each collection vehicle at disposal site will be allocated one number (1,2,3..) for random selection of sites for collection of samples



Random Sampling

For example if the number of samples is decided as 20 and it is also decided to collect samples from generators or collection points as well as from disposal facility (from vehicles) – 10 each

Sample No.	1	2	3	4	5	6	7	8	9	10
Collection site	2	3	5	7	8	11	12	15	17	18
Disposal site	1	2	6	8	12	13	15	17	18	20

The details should be chalked out for sample collection and sorting, including timetable, team members, and sample sorting procedures: hand sorting or visualization and weighing

Sample No.	1	2	3	4	5	6	7	8	9	10
Collection site										
Date/Time										
Team										
Equipment										
Method										
Disposal site										
Time										
Team										
Equipment										
Method										



Analysis of Samples

Sample No. 1 Location: Street A1, District A

Sample Type: Waste Container for primary collection

Sample Type: Mixed / Segregated

Volume: 2 m3

Weight: 45.1 Kg

Component	Wet Weight	Dry Weight	Composition							
	kg	kg	MC	CV	C	H	O	N	S	Ash
Food Waste	4.1	1.2	70	3809	0.6	0.1	0.5	0.0	0.0	0.1
Paper	15.4	14.5	6	14905	6.3	0.9	6.4	0.0	0.0	0.9
Cardboard	2.7	2.6	5	16383	1.1	0.2	1.2	0.0	0.0	0.1
Plastic	3.2	3.1	1	37020	1.9	0.2	0.7	0.0	0.0	0.3
Textiles	0.9	0.8	10	13553	0.4	0.1	0.3	0.0	0.0	0.0
Rubber	0.2	0.2	0	41803	0.2	0.0	0.0	0.0	0.0	0.0
Leather	0.2	0.2	20		0.1	0.0	0.0	0.0	0.0	0.0
Yard Wastes	8.4	2.9	65	3832	1.4	0.2	1.1	0.1	0.0	0.1
Wood	0.9	0.7	20	14961	0.4	0.0	0.3	0.0	0.0	0.0
Glass	4.0	4.0								
Metals	5.1	5.1								



Data Aggregation & Presentation

- ❖ Data for all the samples is aggregated and extrapolated to draw the scenario for overall solid waste as shown in Chapter 3
- ❖ The data could be presented in similar fashion through tables and graphs as suggested in Chapter 3



Information on Direct Recovery

Simultaneously information should be collected from the generators on their direct reuse, recycling and disposal of waste other than dumping at the waste collection points or waste disposal facilities

District A County / Street	A1	A2	A3	A4	A5	A6	A7
Population, No. of houses Single family & Multi-family	2000 100 30	1000 20					
Number & type of commercial undertakings	Fruit Mart 5 shops	Services 5 Banks 4 Office					

Street A1	SF	SF	SF	SF	MF	MF	Shop
Type and amount of waste for reuse and recycling	2 Plastic jar 1 newspaper	2 newspapers					
Ballpark estimates for %age of waste being reused or recycled at source	5%	4%					

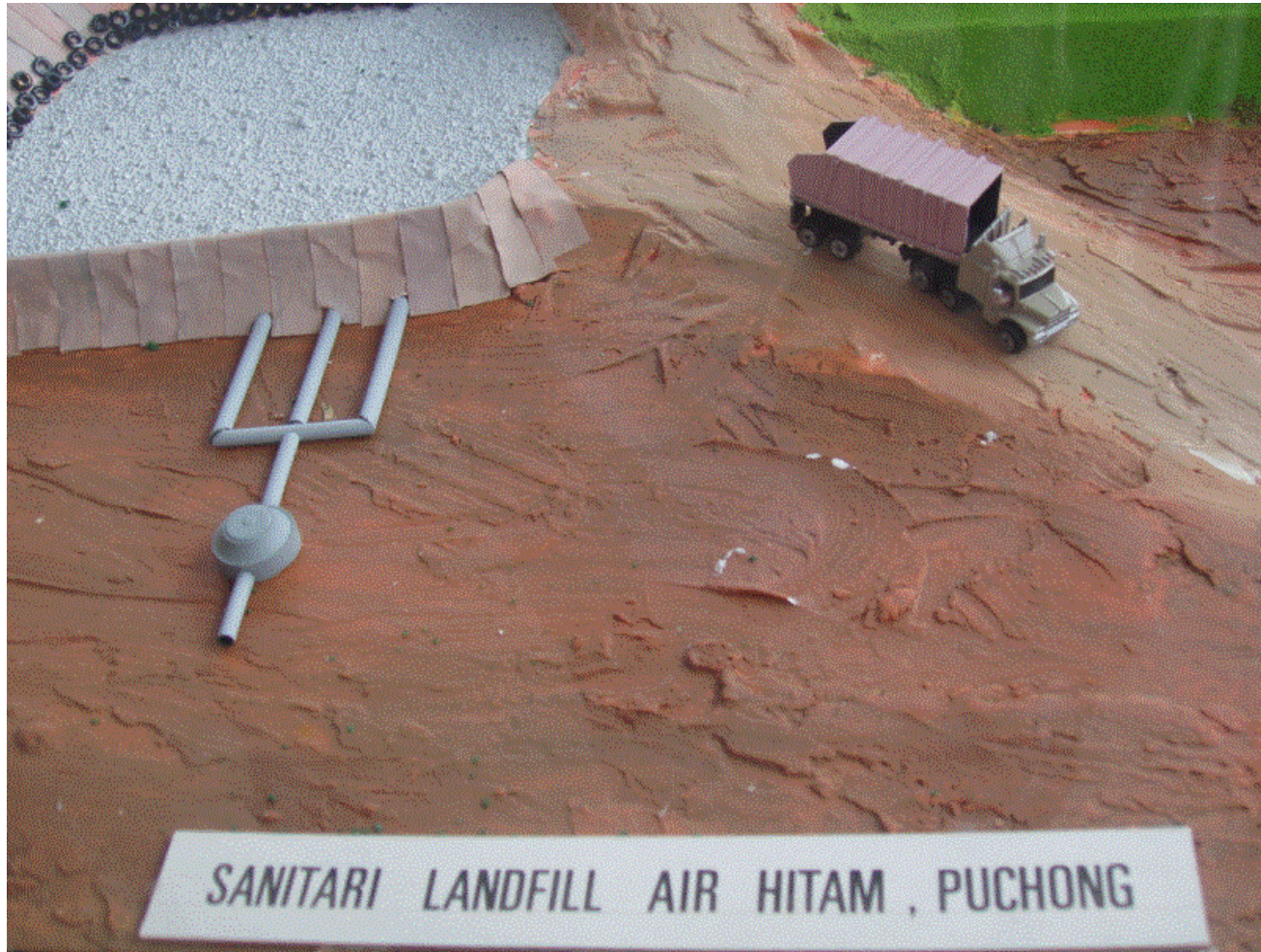


Residential Hazardous Waste

The most common hazardous waste from residential sources may include containers of various types of paint, batteries, fluids for vehicles and equipment, used oil, and others. A separate data sheet should be prepared, if households segregate hazardous waste at source. However, if it is evident from analysis of samples, that hazardous waste is mixed within these samples then this should also be listed in the sample analysis forms

Hazardous Waste	District A	District B	District C	Total
Batteries				
Containers of auto oil /fluid				
Containers of pesticides				
Containers of paint				





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Thank You...

