SOLID WASTE MANAGEMENT
IN NEGARA BRUNEI DARUSSALAM

Department of Environment, Parks and Recreation
Ministry of Development

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SOLID WASTE GENERATION
BASIC FACTS

Year 2005
Population : ~ 350 000
Growth rate : 2.4 %
Average disposal of waste per capita : ~ 1.4 kg/person/day
Waste generation : 189 000 ton per year

[ Review : LTL Resources 2005 ]

Year 2024
Population : ~ 526 000
Estimated waste will be managed in 20 years projection : ~ 4.5M ton
Total Population Today: ~350,000

Total Population in 20 years: ~526,000

Total Waste to be Managed Over 20 Years: 4,500,000 tonnes

Municipal, residential, commercial, no-hazardous industrial, construction wastes
Municipal Waste Composition
(based on waste survey completed week of 11 April 2005)

- Food waste: 36%
- Paper: 18%
- Plastic: 16%
- Yard Waste: 6%
- Diapers: 6%
- Other: 5%
- Metal: 4%
- Glass: 3%
- Textiles: 2%
- Wood: 1%
- Inert: 1%
- Rubber: 1%
- E-waste: 1%

Brunei-Muara District: 2005 Waste Composition
(based on waste survey completed week of 11 April 2005)

- Construction & Demolition: 5%
- Soil: 5%
- Sewage: 1%
- Tires: 1%
- Yard & Landscaping: 6%
- Land Clearing: 5%
- Mixed Residential, Institutional & Commercial: 77%

Total Waste Stream Estimate
(based on vehicle count completed week of 25 January 2005)
WASTE GENERATION

• RESIDENTIAL
  [ private dwellings and high rise flat ]

• COMMERCIAL
  [ shop houses, restaurants, market, open market, bank ]

• INSTITUTIONAL
  [ schools, hospitals, government office buildings ]

• INDUSTRY
  [ Goods manufacturing factories and storing or warehouses ]

OTHER WASTES:

waste soil; construction wastes; toxic wastes and hazardous wastes; waste oil or used oil
EXISTING SOLID WASTE MANAGEMENT SYSTEM IN BRUNEI DARUSSALAM
EXISTING SOLID WASTE MANAGEMENT SYSTEM

Generating wastes
Residential / Commercial / Industry / Institutional

- Recycling Companies
- Private Individual
- Private Companies
- Government Sector

- Indiscriminate Dumping
- Open Burning
- Road Side, Drain, Drainage Systems, Building perimeter etc.

- Waste Generation
- Waste Collection
- Recycling
- Waste Disposal
- Institutional work program

- ‘Scavenging’
- Marketed at Domestic and Abroad level
- Landfill Site

In the process of updating and improving the system

Not all wastes can be collected and dispose at Landfill Sites
INSTITUTIONAL FRAMEWORK
- Capacity Building
- Organisational Set-up
- Policies & Regulation
- Enforcement

DISPOSAL
- Improve interim operations of disposal sites
- Proper Closures and Rehabilitation
- Environmental Monitoring
- Engineered Landfill

WASTE REDUCTION
- Composting
- Recycling
- Incineration

WASTE GENERATION
- Public Awareness Programme

COLLECTION
- Develop & Improve Services
- Develop & Implement Tariffs
- Public Awareness Programme

TRANSFER
- Develop Transfer Facilities
- Regional / Kg Air

Integrated Waste Management System
SOLID WASTE COLLECTION
WASTE COLLECTION

- PRIVATE INDIVIDUAL DISPOSAL TO LANDFILL SITES & WASTE CENTRES

- HOUSE TO HOUSE COLLECTION
  - Brunei Muara
  - Kampong Air

- REGISTERED PRIVATE WASTE COLLECTING COMPANIES
  - Brunei Muara
  - Commercial Areas
  - Light Industrial Areas

- WASTE BINS CENTRES
  - Electrical waste Compactor and skips in Brunei Muara
  - Skips and bins in Tutong
  - Bins in Temburong
  - Skips in Seria & Belait

- UNREGISTERED PRIVATE COLLECTING WASTE COMPANIES
<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Sector Haulers</td>
<td>26%</td>
</tr>
<tr>
<td>Registered &amp; Approved Haulers</td>
<td>34%</td>
</tr>
<tr>
<td>Unregistered Haulers (including self haul)</td>
<td>40%</td>
</tr>
</tbody>
</table>
REGISTERED & APPROVED HAULERS

1. Sisco Simin Company
2. Kyoei Buildmaintenance Sdn Bhd
3. MBJ Services
4. Rome Suri Enterprise
5. Mashhor General Contractor Sdn Bhd
6. Syarikat Hamsal & Anak-anak
7. Syarikat Pg Hjh Patimah & Anak-anak

Total Zone: 19 Zones
EFFORTS ARE BEING IMPLEMENTED
- TO TAKEOVER TASKS & RESPONSIBILITY OF THE SERVICE STAGE BY STAGE

- TO IMPROVE EFFICIENCY AND STANDARD OF COLLECTING SERVICE FOR TUTONG AND TEMBURONG DISTRICTS:
  - COLLECTION CONTRACT DOCUMENTS
  - IMPLEMENTATION IMAGE AND STATUS OR POPULARITY
  - FREQUENCY OF COLLECTION
  - USAGE OF WASTE COMPACTOR TRUCK
  - MONITORING
  - MEETING WITH HEAD VILLAGE LEADERS
- TO IMPLEMENT WASTE COLLECTING PROJECTS THROUGH ‘DEPARTMENTAL’

- TO REVIEW COLLECTION ZONES IN BRUNEI MUARA DISTRICT

- PLANNING FOR NATIONAL DEVELOPMENT PLAN (RKN) 9 PROJECTS
<table>
<thead>
<tr>
<th>BRUNEI MUARA</th>
<th>TUTONG</th>
<th>BELAIT</th>
<th>TEMBURONG</th>
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<tbody>
<tr>
<td>Collection and transporting service for house to house waste manage by Dept. of Environment, Parks &amp; Recreation (JASTRE)</td>
<td>19 Waste bin Centres + 7 bus stop manages by the Dept. of Environment, Parks &amp; Recreation (JASTRE)</td>
<td>Collection is still manage by Belait District Office Except all waste collection manage by Public Works Dept. (JKR)</td>
<td>All solid waste collection centres</td>
</tr>
<tr>
<td>Transfer by Municipal Board BSB 1&lt;sup&gt;st&lt;/sup&gt; April 2004</td>
<td>Transfer by Tutong District Office 26th January 2005</td>
<td>Transfer by Public Works Department 1&lt;sup&gt;st&lt;/sup&gt; April 2006</td>
<td>Transfer by Temburong District Office 15th September 2005</td>
</tr>
</tbody>
</table>
Municipal Solid Waste Landfill Sites

1. Sg Akar, Brunei Muara
2. Bukit Udal, Tutong
3. Sg Burung, Tutong
4. Anduki, Seria
5. Dua-o-Dua, Seria (Eng. Private own)
6. Kg Rubada, Temburong
Sungai Akar Brunei-Muara Landfill Sites
Green wastes have been made for Composts as the Photos shows.
THANK YOU