Imazu Sports Park (a completed landfill site)

The Fukuoka Method

Imazu School for Handicapped Children

Imazu “Refresh” Farm

Fukuoka City Environmental Bureau
Fukuoka City Landfills

- East (Fushitani) Landfill
- West (Nakata) Landfill
East (Fushitani) Landfill

Total area: Approx. 644,000 m²
Filled area: Approx. 225,000 m²
Capacity: Approx. 3.74 million t (3.4 million m³)
Time duration: Since April 1988
Hisayama Grounds Golf Course, created in Zone 1 of the completed landfill

Area of former landfill site: 13,000 m²
8 holes (240m) × 2 courses
Beginning of service: August 2007
West (Nakata) landfill

Grounds (Total area)

Total area: 380,000 m²

Filled area: 180,000 m²

Capacity: 2,380,000 t (1.8 million m³)

(As of late March 2009, 655,000 t (~28% filled))

Time duration: ~20 years since 1996
August 2007
Opening of the leachate collection & drainage pipe

Construction of leachate collection & drainage pipe
Development of the Fukuoka Method (Semi-Aerobic Landfill Structure)

Fukuoka City’s landfill around 1970 (Hatta Landfill)

Until the 1960~70s, Japan, like many other Asian countries today, used anaerobic landfills

Lead to environmental problems such as toxic leachate and foul odor

The start of experiments to improve landfills, aiming to purify leachate
Experiments by Fukuoka City and Fukuoka University

An Test Plant was constructed at Hisayama Landfill in 1973.
Left: Aerobic landfill experiment, Right: Improved anaerobic landfill experiment
Impact of Fukuoka Method: Leachate Treatment

Improvement over time of the landfill structure and leachate’s biological oxygen demand (BOD) (combustible waste)
There are essentially 3 landfill methods

① Anaerobic
- High emissions of harmful substances such as CO2, methane, etc
- Waste is in a leachate state

② Aerobic (Cross-section)
- Relatively less emission of harmful substances such as CO2, methane, etc
- Easy treatment of leachate
- High cost of construction and maintenance

③ Semi-aerobic (Cross-section)
- Relatively less emission of harmful substances such as CO2, methane, etc
- Easy treatment of leachate
- Low construction and maintenance costs
Fukuoka Method (Semi-aerobic landfill method structure) Diagram

- Waste decomposition
- Fermentation heat
- Temperature gap between landfill interior/exterior
- Air circulation

Diagram shows the structure and process of the Fukuoka Method, including air circulation, waste decomposition, and fermentation heat generation.
Advantages of the Fukuoka Method

The Fukuoka Method:

An efficient landfill method ( = Semi-aerobic landfill structure ) with low environmental impact developed jointly by Fukuoka City and Fukuoka University

Key aspects

1 Advanced technology unnecessary
2 Low cost
3 Environmentally friendly
The first landfill in Japan to use the semi-aerobic landfill structure
Shinkamata Landfill (1975)
Example of utilization of a completed landfill site

Sports park

Refresh farm

Waste water treatment plant

School for handicapped children

Farmland

Zuibaiji River

Post-landfill Site Utilization — Imazu Sports Park —
Imazu landfill – Images from period of landfill construction (1975~1999)
Imazu Today: Utilization of a Former Fukuoka Method Landfill Site

Tennis court

Imazu School for Handicapped Children

Imazu Refresh Farm
International Cooperation

Pakistan Waste Treatment Technology Training
People’s Republic of China:
Landfill in Weifang City, Shandong Province

October 2003

Landfill area: 64,000 m²
Capacity: ~1.16 million m³
Time duration: ~3 years
Daily waste intake: ~700 t
Fukuoka City/ Hakata Bay west coast zone