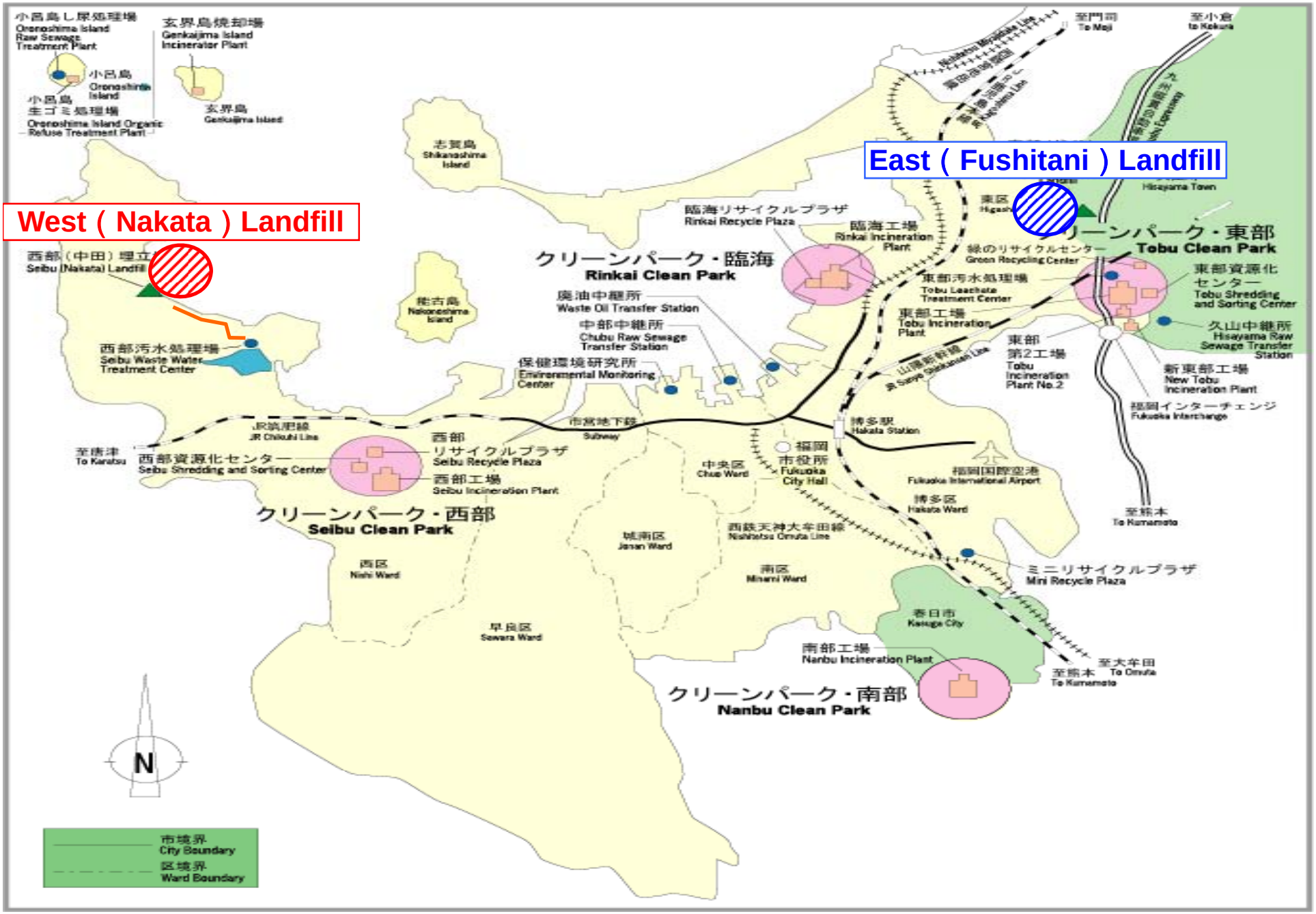
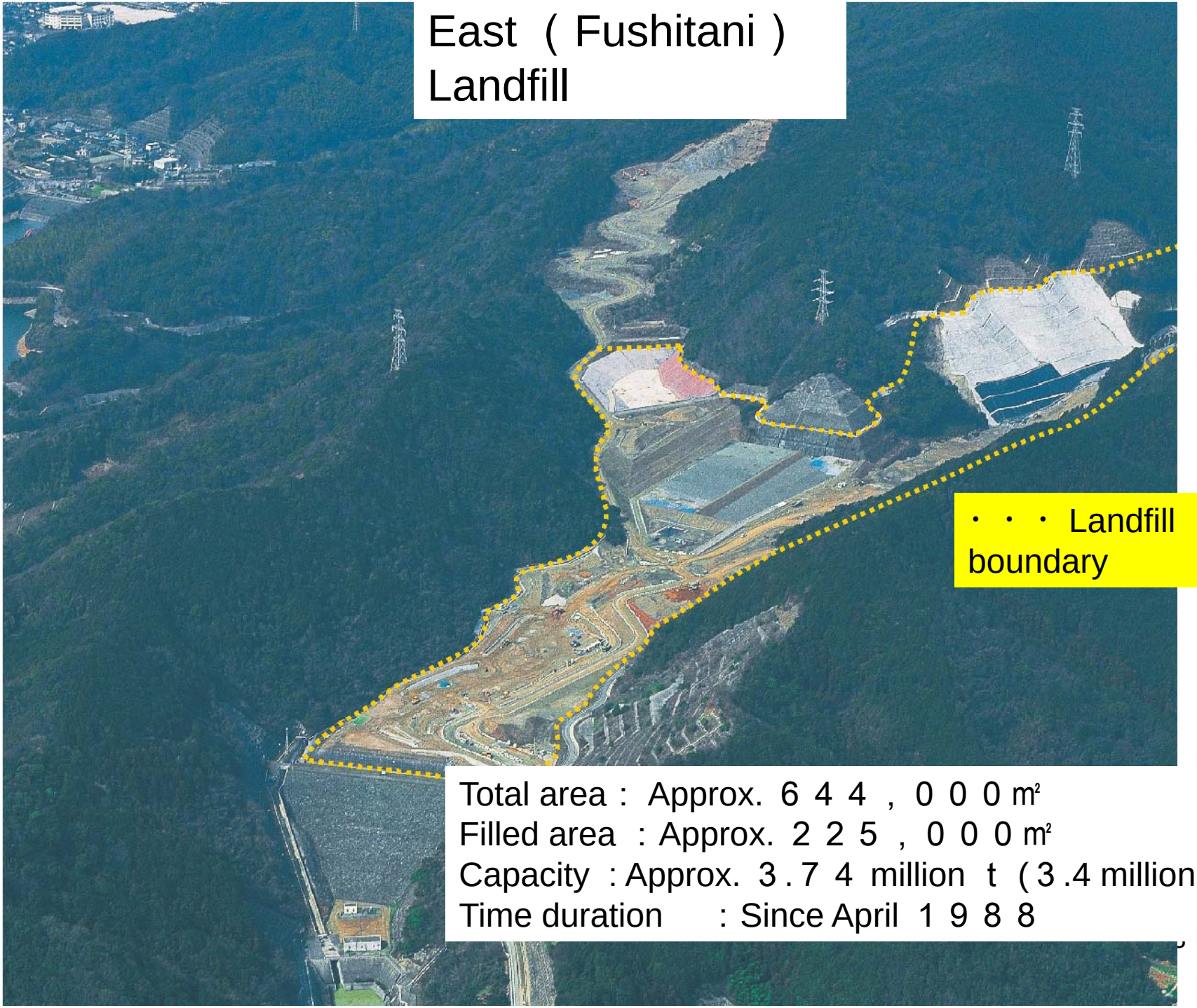
The Fukuoka Method

Fukuoka City Environmental Bureau

Fukuoka City Landfills

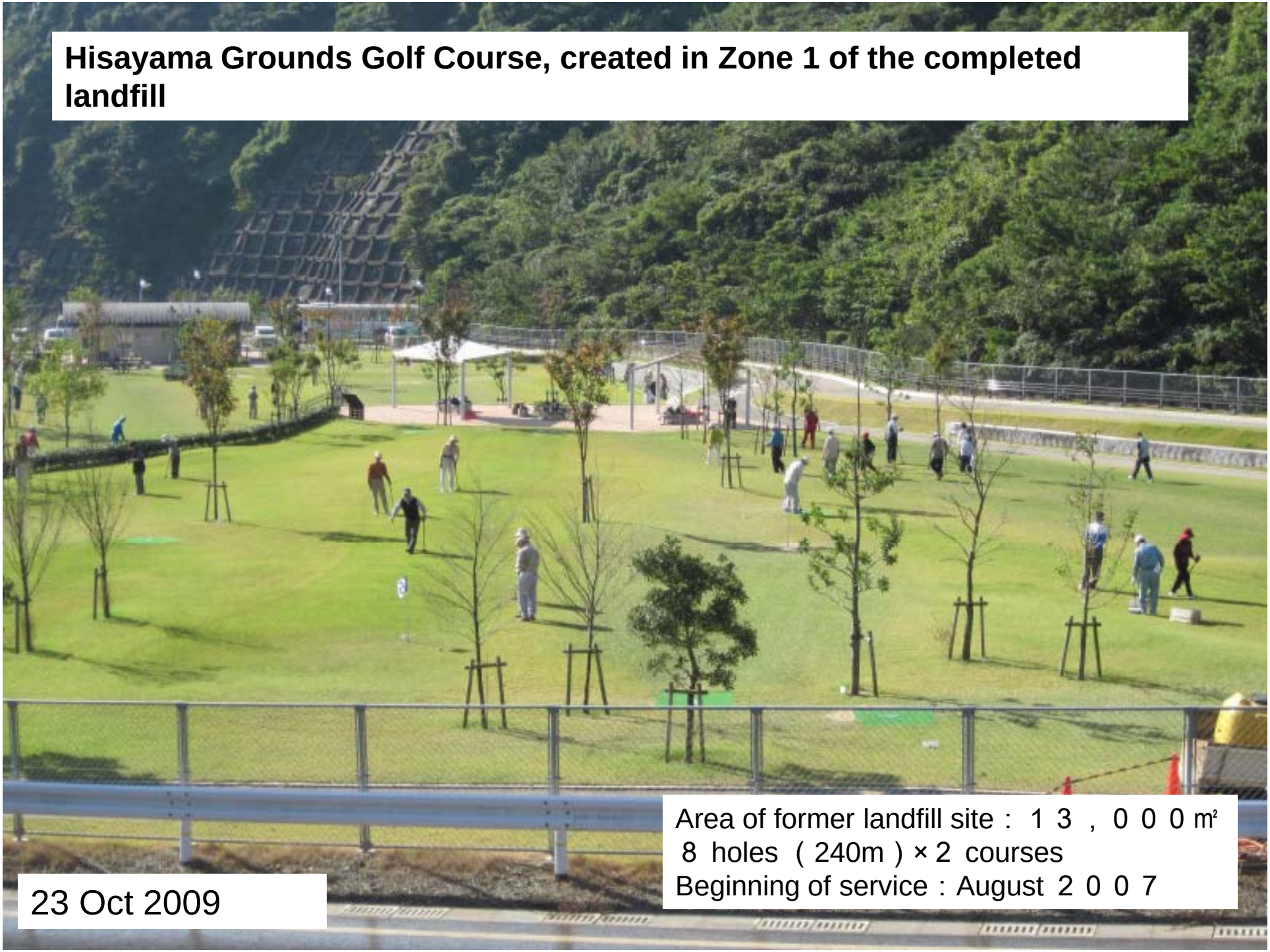


East （ Fushitani ） Landfill



Total area : Approx. 6 4 4 , 0 0 0 ㎡
Filled area : Approx. 2 2 5 , 0 0 0 ㎡
Capacity : Approx. 3 . 7 4 million t (3 .4 million ㎥)
Time duration : Since April 1 9 8 8

Hisayama Grounds Golf Course, created in Zone 1 of the completed landfill



Area of former landfill site : 1 3 , 0 0 0 ㎡
8 holes (240m) × 2 courses
Beginning of service : August 2 0 0 7

23 Oct 2009

West (Nakata) landfill

Total area : 380,000㎡

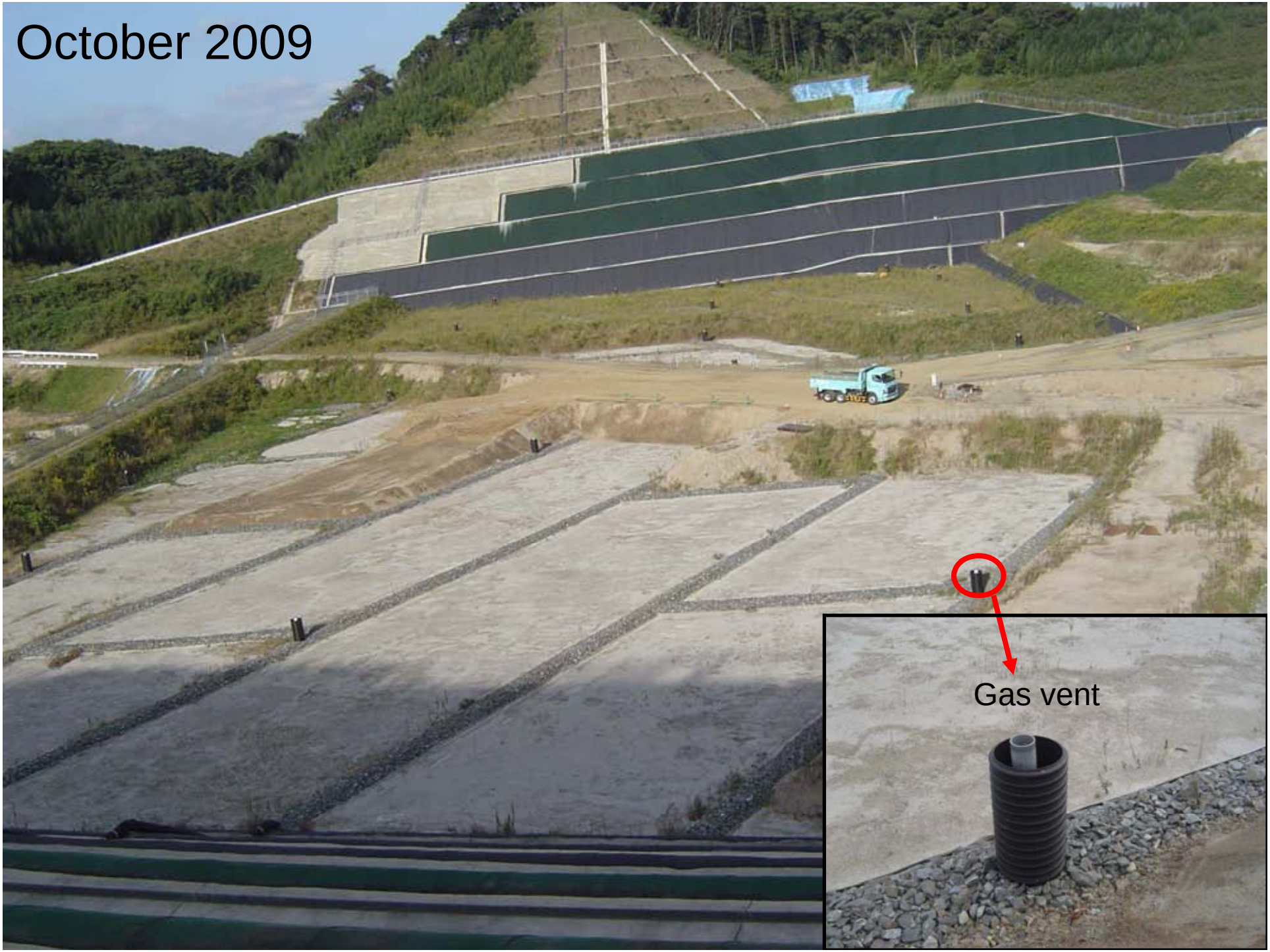
Filled area : 180,000㎡

Capacity : 2,380,000 t (1.8 million m3)
(As of late March 2009, 655,000 t (~28％filled)

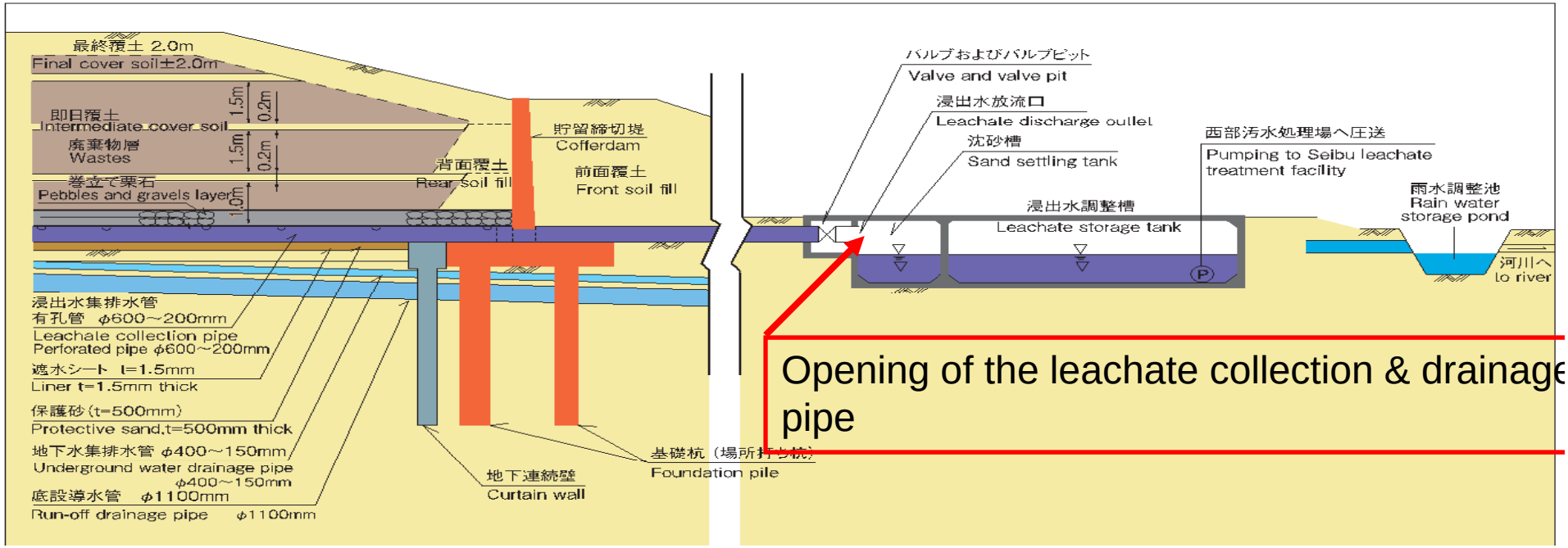
Time duration : ~20 years since 1996


March 2007


August 2007


October 2009
Gas vent

貯留締切堤周辺 Detailed view of cofferdam area



Construction of leachate collection & drainage pipe

浸出水集排水管放流口 Collected leachate outlet pipe


Solid Waste Retaining Structure

Development of the Fukuoka Method（Semi-Aerobic Landfill Structure)

Fukuoka City's landfill around 1 9 7 0 (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

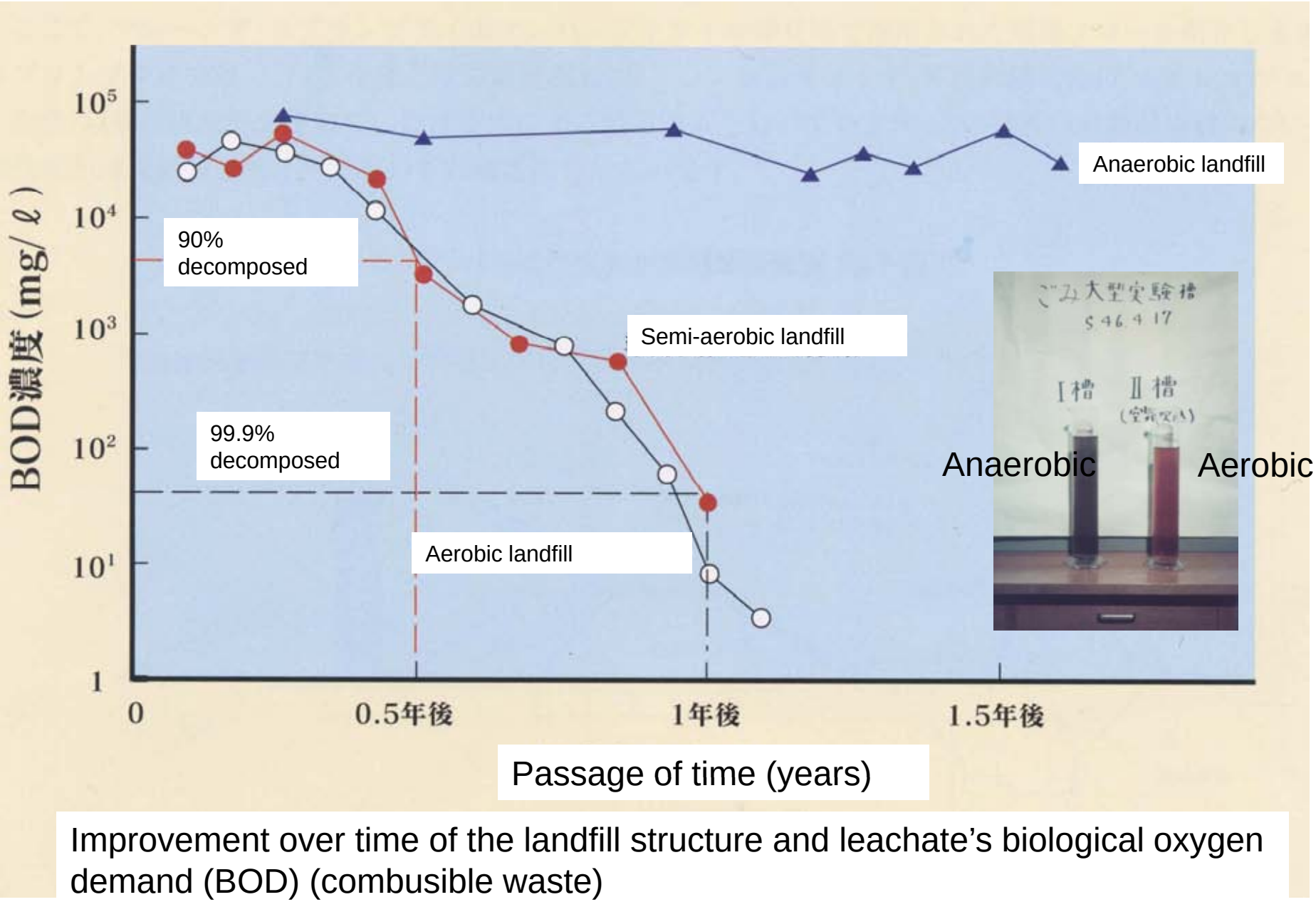
The start of experiments to improve landfills, aiming to purify leachate

Experiments by Fukuoka City and Fukuoka University

An Test Plant was constructed at Hisayama Landfill in 1 9 7 3

Left: Aerobic landfill experiment, Right: Improved anaerobic landfill experiment

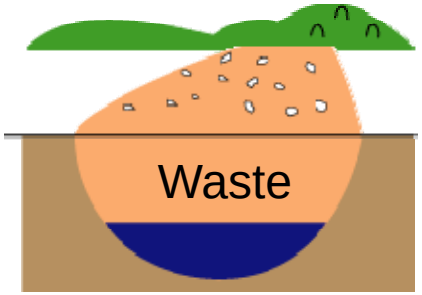
Impact of Fukuoka Method: Leachate Treatment



Improvement over time of the landfill structure and leachate's biological oxygen demand (BOD) (combusible waste)

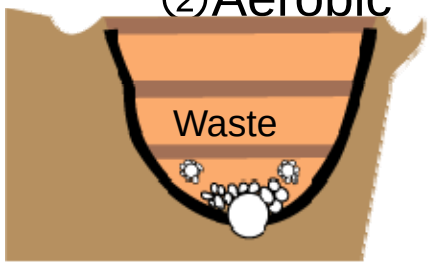
There are essentially 3 landfill methods

①Anaerobic

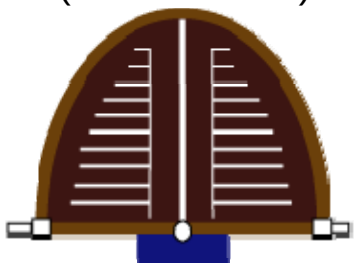


- High emissions of harmful substances such as CO2, methane, etc
- Waste is in a leachate state

②Aerobic

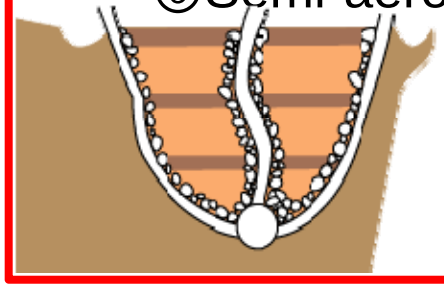


(Cross-section)



- Relatively less emission of harmful substances such as CO2, methane, etc
- Easy treatment of leachate
- **High cost of construction and maintenance**

③Semi-aerobic



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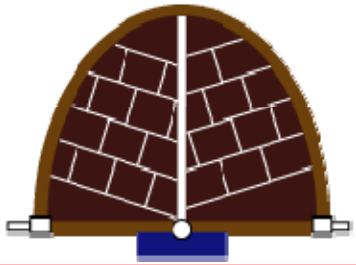
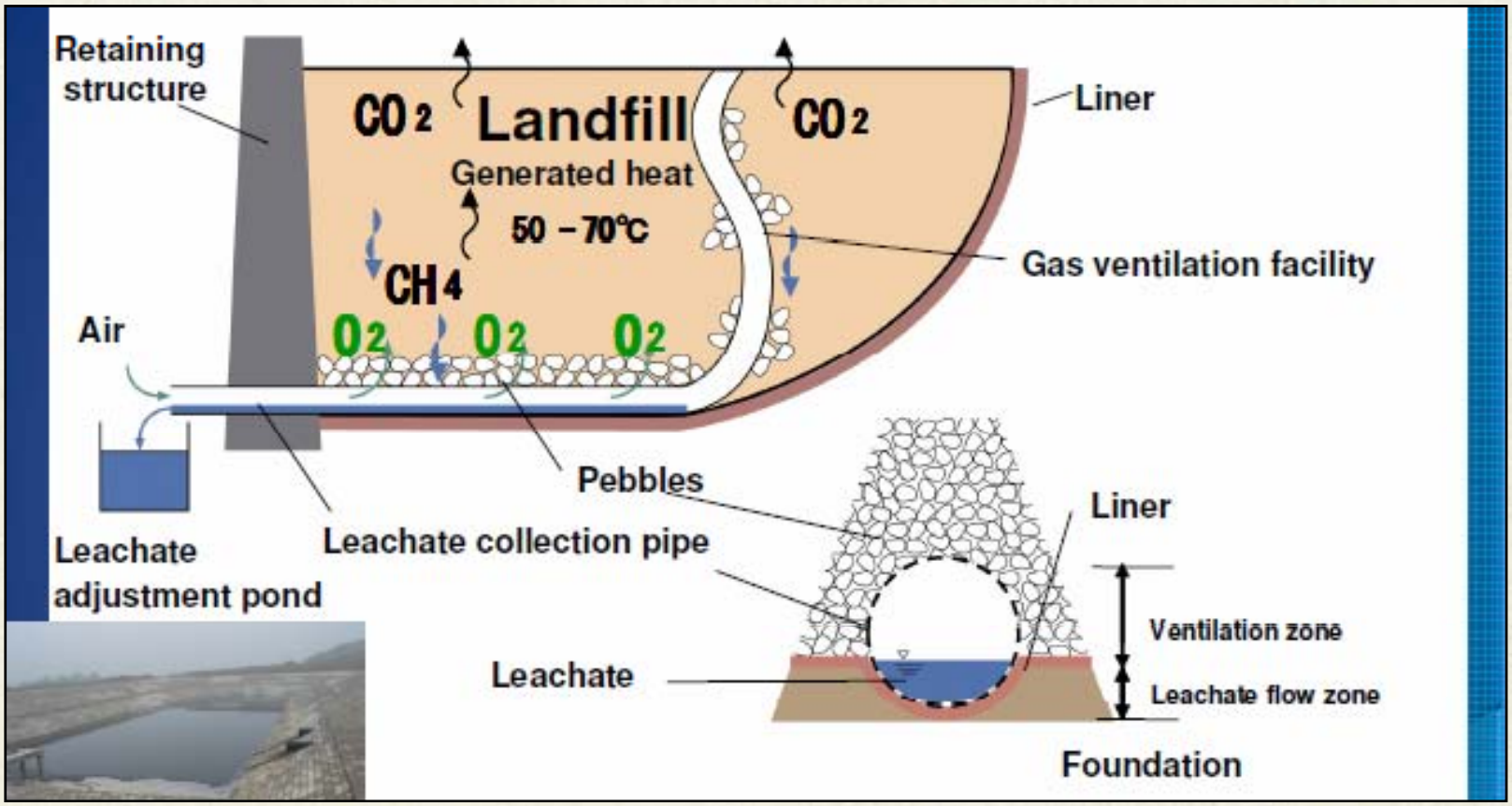


Fukuoka Method

- 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

廃棄物の分解 → 発酵熱 → 埋立地内外温度差

空気の流入

Air circulation

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

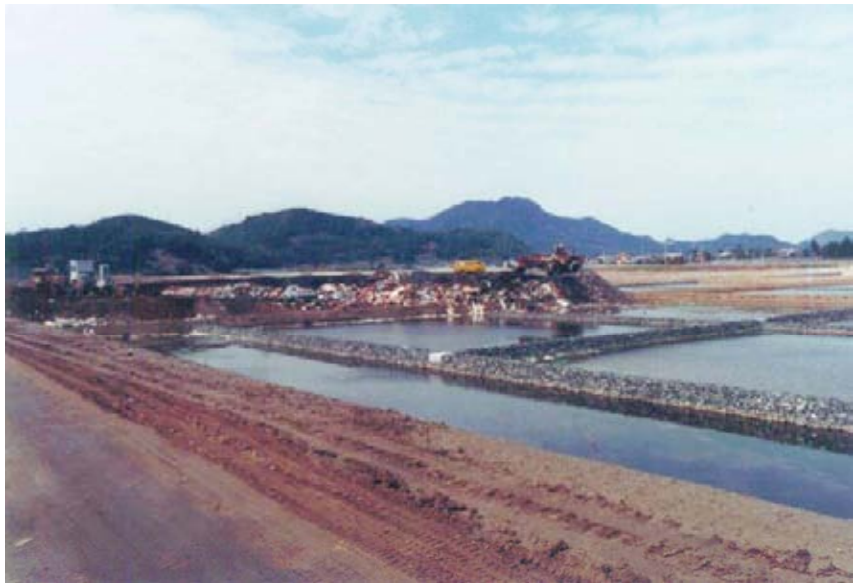
3 Environmentally friendly

Construction of Fukuoka Method Landfill　Fukuoka City

The first landfill in Japan to use the semi-aerobic landfill structure
Shinkamata Landfill　(１９７５)

Example of utilization of a completed landfill site

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

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


Sept 2004

Fukuoka City／Hakata Bay west coast zone