Presentation from the

Workshop on Innovations for Scaling up to Citywide Sanitation

October 16-17, 2012, Ahmedabad

p a s performance assessment system

Organised by PAS Project, CEPT University

OVERVIEW OF FECAL SLUDGE MANAGEMENT IN MALAYSIA

Ahmedabad, India

16-17th October, 2012

Introduction

- Sewerage Service in Malaysia was privatized in 1994.

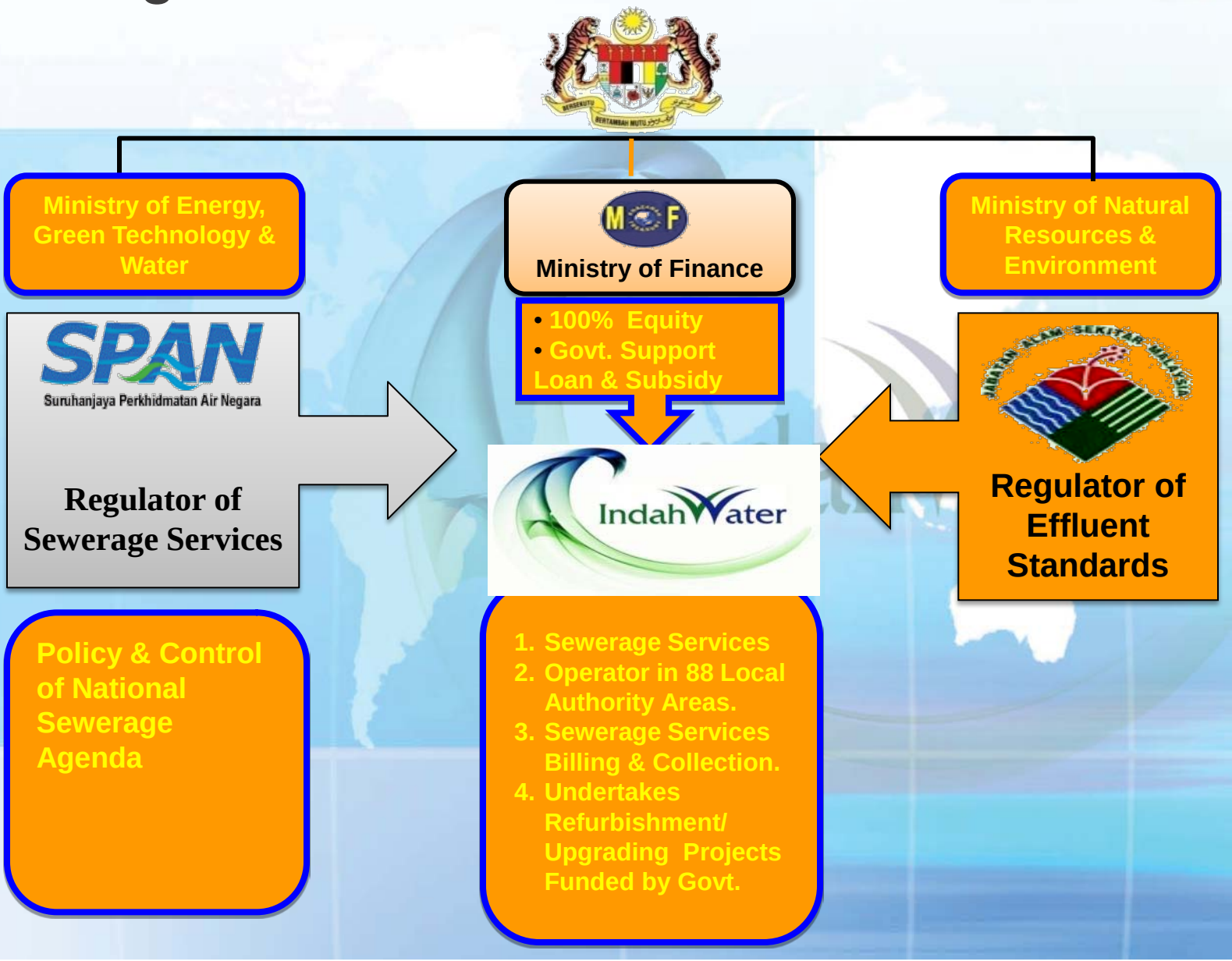
- The concession was given to Indah Water Konsortium (IWK) for a period of 28 years. Before privatisation, sewerage services were the responsibilities of local and city councils.

- IWK operates and maintains all public STPs and sewer networks within the service area covering the whole country except 3 states.

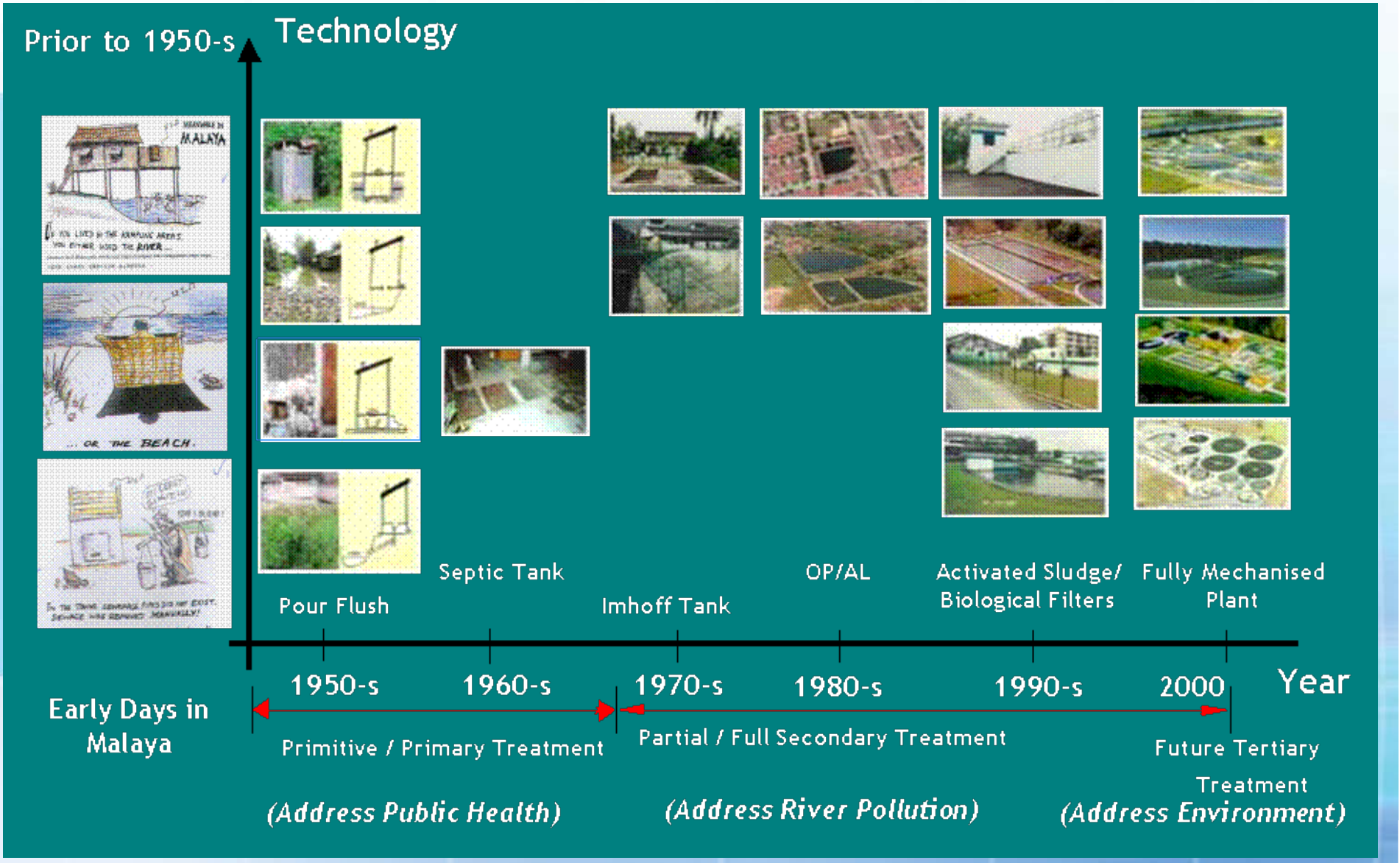
- To date, IWK is operating and maintaining 9,446 nos. of STP and 16,000 km of sewers with a total connected PE is 19.9 million.

- Water and Sewerage Industry Act (WSIA) came into force in 2008 to regulate water and sewerage services sector.

Governance Structure of Sewerage Services



Sewerage Treatment Progression



Desludging Service For Individual Septic Tanks, Pour Flush And Private Plants

- Indah Water Konsortium provides desludging services to septic tank customers or private plants or individual owners of sewage treatment systems.

- Approx. 1.22 million septic tanks (IST) within Indah Water Konsortium operational areas serving more than 6 million population.

- Approx. 826,388 nos. of pour flush, a basic sanitation system introduced back in 1960's, serves about 4.1 population nationwide, majority in rural areas.

- Septic tank owners are required to desludge their tanks once in every three years failing which, untreated sewage and sludge solids will be released into rivers causing environmental problems.

Type of Desludging Services

- Scheduled Desludging - Services received by customers through scheduling done by IWK, once in every three years.

- Demand Desludging - Services received by customers upon request, 2 months before the due date for next cycle of desludging.

- Repeat Desludging - Services received by customers upon request within the period of 34 months from the last desludging date.

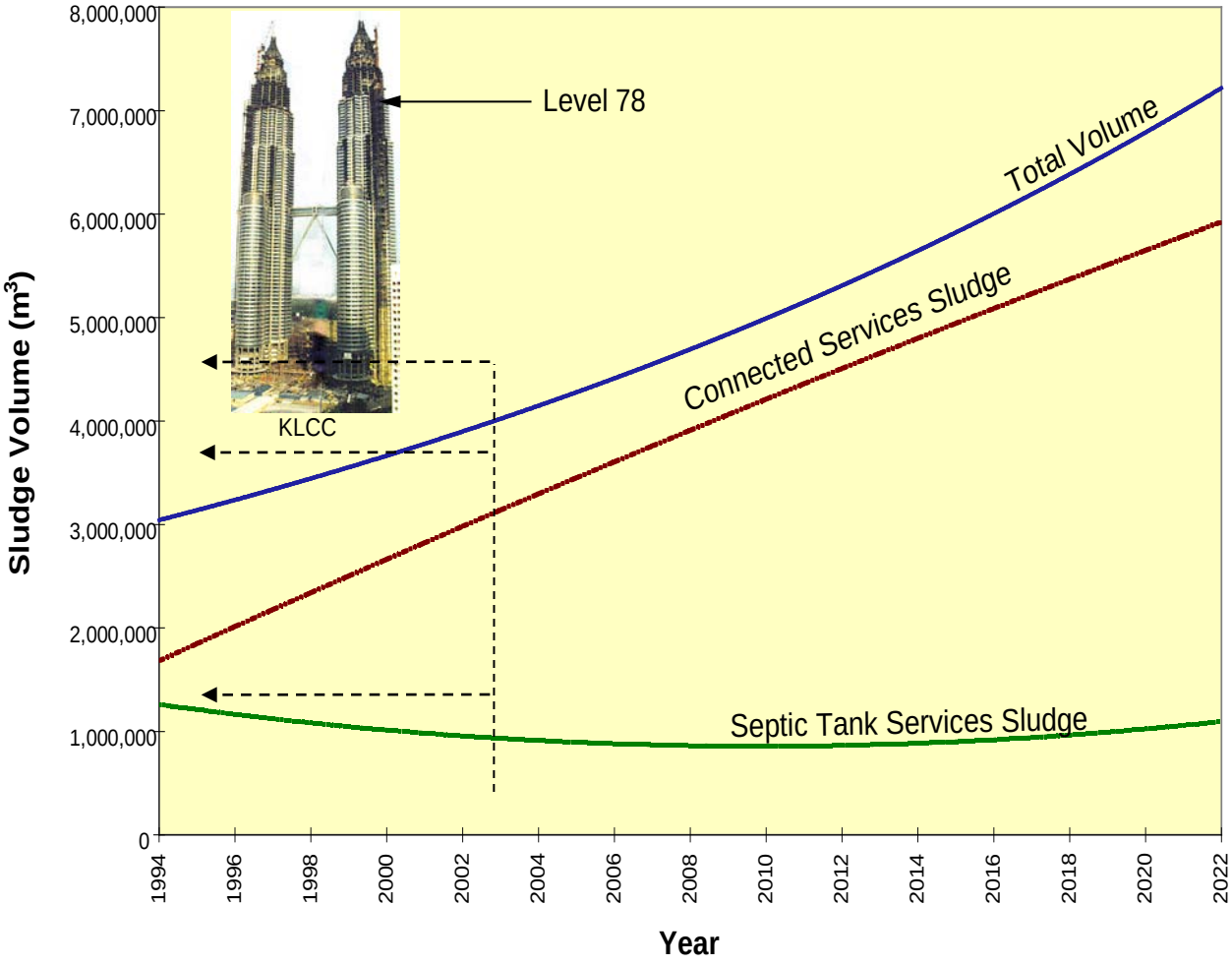
- Responsive IST or Pour Flush Desludging - Services requested by IST users outside IWK's concession area or pour flush users.

Fecal Sludge

Definition

"Fecal sludge is the by-product of almost every method of treatment of wastewater"

Extent of Sludge Management Problems



Estimated Sludge Quantities in Malaysia

Fecal Sludge Sources

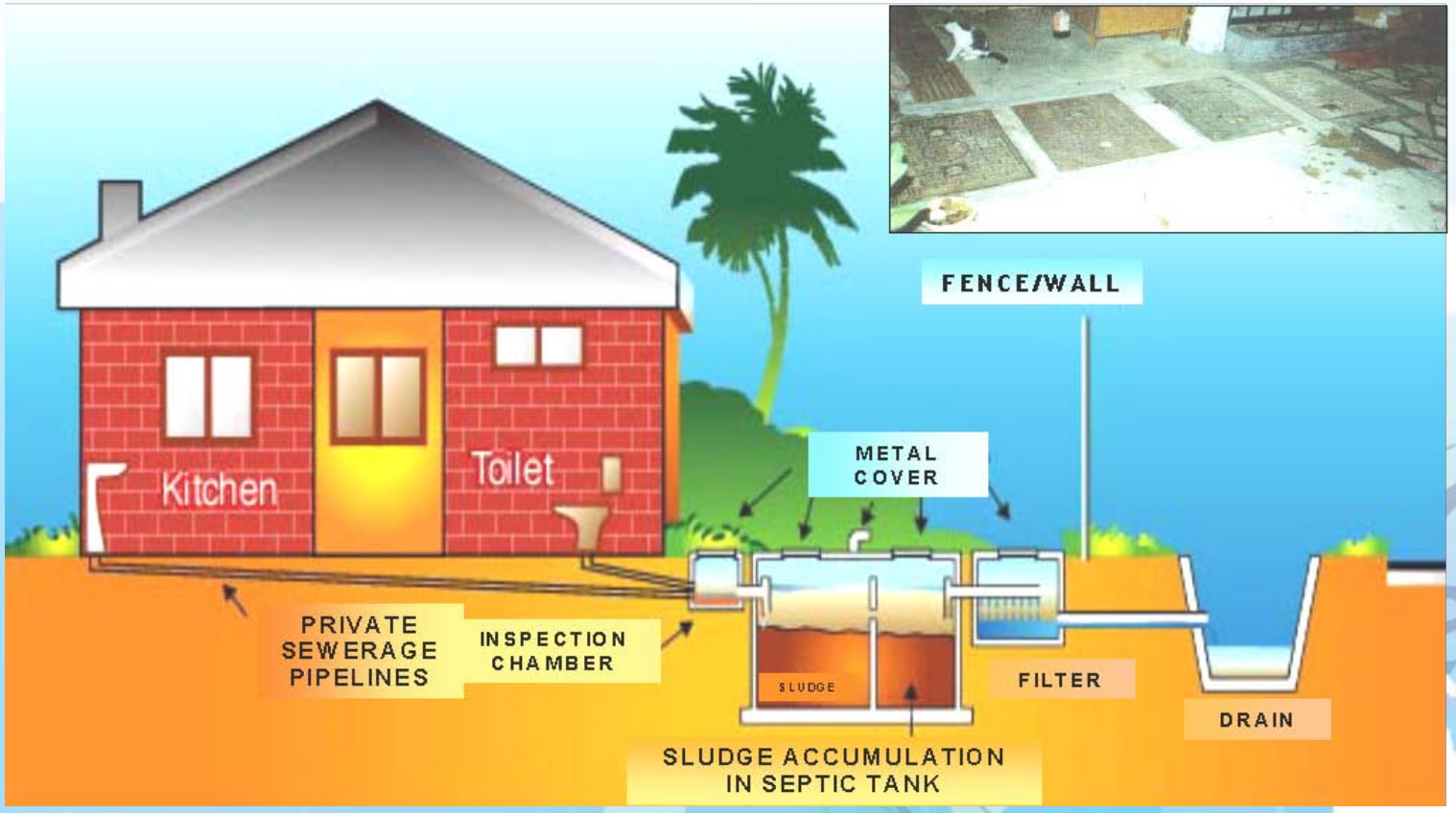
Individual Septic Tanks (IST) / Communal Septic Tanks (CST)

Aerated Lagoon (AL) / Oxidation Pond (OP)

Activated Sludge STPs

SLUDGE

IST Desludging



Pond Desludging

Pumping of Sludge to Treatment Facility

Dried Sludge after Dewatering

Dried Sludge to be Disposed Off to an approved site

View of Pond after completion of Desludging Exercise

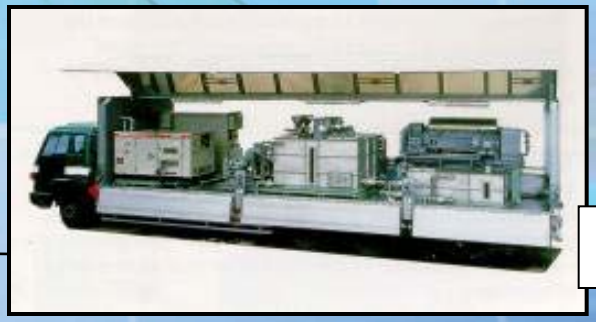
Technological Evolution of Fecal Sludge Treatment in Malaysia

Trenching

Sludge Lagoons

Centralised Sludge Treatment Facility

Drying Beds



Mechanised Dewatering

Mobile Dewatering

Progress Improvements of Sludge Management

Sludge Dewatering Techniques

Land Application	• Trenching System
Evaporation	• Sludge Drying Beds • Sludge Lagoons
Semi Mechanical	• AVC System
Mechanical	• Belt Press • Filter Press • Centrifuge

Fecal Sludge Treatment / Processing

Trenching

Geobag *

Sludge Lagoon

NON-MECHANISED

Drying Bed

Note * : Utilisation of Geo-bag method is presently under trial basis at certain areas.

Fecal Sludge Treatment / Processing

Centralised Sludge Treatment Facility

Belt Press

Mobile Dewatering

MECHANISED

Centrifuge Decanter

Filter Press

Centralised Sludge Treatment Facilities

Dedicated sludge treatment facilities with Department of Environment approval nationwide

IWK CURRENT SLUDGE FACILITIES

Trenching System
Completed : 25 Nos

Drying Beds
Completed : 3 Nos

Sludge Lagoon System
Completed : 1 Nos

Sludge Reception Facility
Completed : 6 Nos

Mechanised
Dewatering Unit
Completed : 23 Nos

Dedicated Centralised
Sludge Treatment
Completed : 8 Nos

Filter Press
83 units

Belt Press
58 units

Centrifuge
19 units

Trenching site at Gunung Raya, Langkawi (Closed)

Trenching site at Sg. Siput, Kuala Kangsar

Trenching site at Kerian, Parit Buntar

Trenching site at Assam Kumbang, Taiping (Closed)Sludge Lagoon at Assam Kumbang

Trenching site at Papan,Perak (Temporary stopped)

Trenching site at Jeram Mengkuang, Bidor

Trenching site at Slim River

Trenching site at Glami Lemi, Jelebu

Trenching site at Juaseh, K. Pilah

Trenching site at Pedas, Rembau

Trenching site at Sg. Udang, Melaka

Trenching site at Merlimau, Jasin

Drying Beds at Private Nursery, Muar (Closed)

Trenching site at Labis, Segamat

Trenching site at Mukim Kupang, Baling

Trenching site at Pengkalan Hulu, Perak

Drying Beds at Tembila, Terengganu

Trenching site at Setiu

Trenching site at Tanggol, Hulu Terengganu

Trenching site at Kumpal, Dungun

Trenching site at Gali, Raub

Trenching site at Bentong, Pahang

Trenching site at Pekan,Pahang

Trenching site at Golden Teak, Batu Pahat (Closed)

Trenching site at Jemaluang, Mersing

Trenching site at Ladang Jaya, Kota Tinggi (Closed)

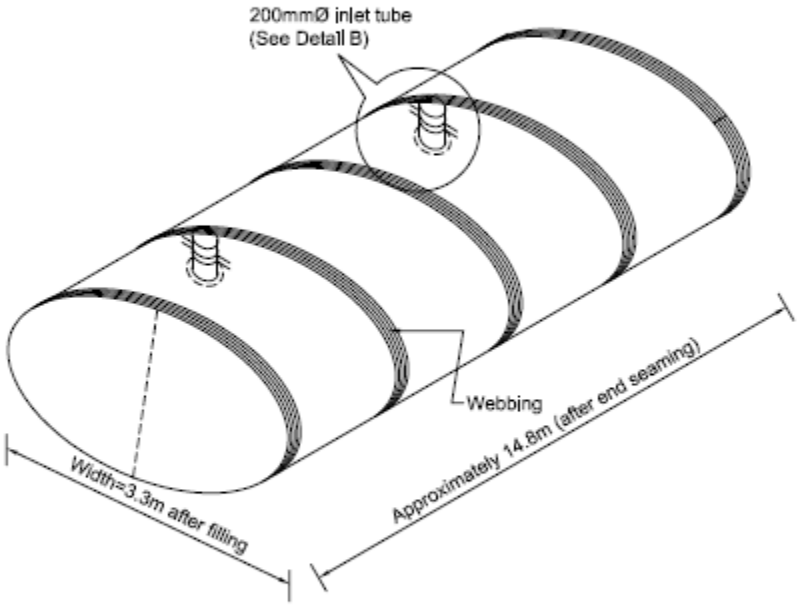
Trenching System

Sludge Drying Beds – Drying Process

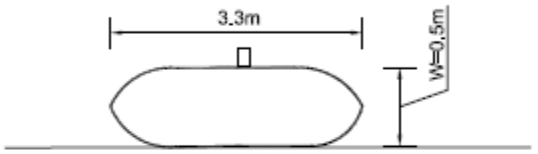
Sludge Drying Beds With Roofing

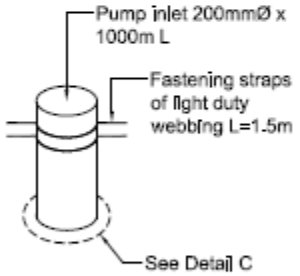
Sludge Drying Beds – Filter Media

Typical Geobag Features

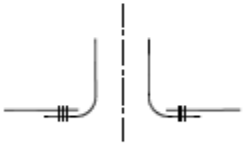


GEODYKE IN ISOMETRIC VIEW
NOT TO SCALE





DETAIL B
NOT TO SCALE



DETAIL C
NOT TO SCALE

NOTES

1) All dimensions are in meters unless otherwise stated.
2) Conceptual design only. Not for Construction.

Project:
Conceptual Design Proposal using Geodyke System for Indah Water Treatment in Sg. Petani, Kedah.

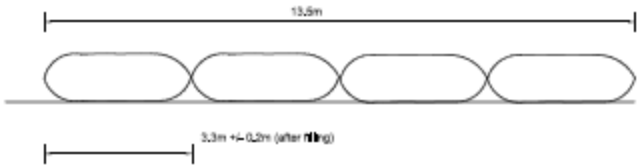
Title:
Typical Details of Geodyke-Dewatering Tube

Drawing No.:	Revision:	Date:
D 1029/10/D1	00	11-June-10

EMAS KARA MARKETING SDN BHD
E-mail: [illegible]
Website: www.karadan.com
Tel: 603-6092 0988 Fax: 603-6092 6902

Typical Geobag

GEODYKE IN ELEVATION VIEW
NOT TO SCALE



SECTION A-A
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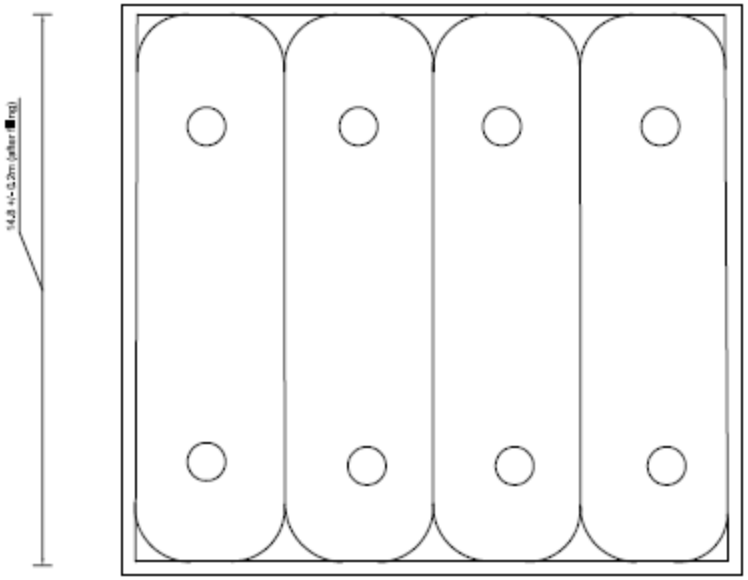

DRY BED WITH DEWATERING TUBE - 4 NOS/BED.
NOT TO SCALE

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Conceptual Design Proposal using Geodyke System for Indah Water Treatment Plant, Sg. Petani, Kedah.

Title:
Typical Details of Geodyke.

Drawing No:	Revision:	Date:
D 1029/10/D2	00	11-June-10

EMAS KIARA MARKETING SDN BHD
E-mail: emaskiara@tm.my
Website: www.kiaratm.com
Tel: 603-6092 9988 Fax: 603-6092 8802

Geobag in Operation

Day 1 –

Commencement

Day 14 at 8.30 am

Height = 0.5 meter

Condition = Half Dry

Day 9 at 8.30 am

Height = 0.6 meter

Condition = Wet

Day 8 at 8.30 am

Height = 0.6 meter

Condition = Wet

Day 7 at 6.00pm

Height = 0.75 meter

Condition = Wet

Semi Mechanical
AVC System

MDU Operation Sequence

Centralized Sludge Treatment Facility

Fecal Sludge Management

Over the 16 years, fecal sludge handling and management in Malaysia has progressively improved to include sludge management strategies, acquiring dedicated and controlled sludge disposal sites and continuous research and development program for sludge reuse.

Sludge Disposal/Reuse

Sludge Disposal

- Landfill
- Incineration

Sludge Reuse

- Agriculture/Landscaping
- Compost/Co-compost
- Brick, Tiles
- Power Generation
- Reforestration

Ultimate Sludge Disposal/Reuse Strategies

Land application of sludge onto rubber plantation

Methods of Disposal/Reuse

- Soil Improvement
- Land Reclamation
- Composting
- Construction Material
- Fertilizer
- Landfill

Rehabilitation of ex-mining land.

Composting

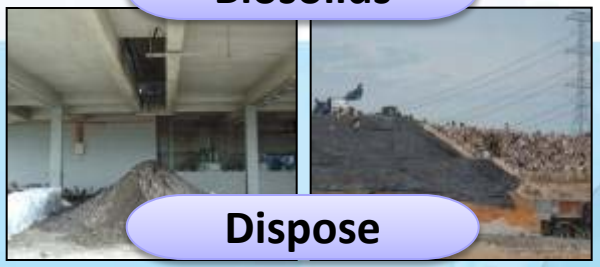
Land Reclamation

Landfill

Exploration of Green Technology

Sewage Treatment Plant

Biosolids



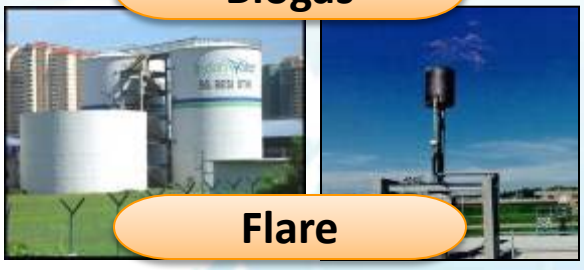
Dispose

Calorific Value: < 3,500 kcal/kg
N < 3%; P < 1%; K < 0.1%
Organic Matter < 50%

1. Proposed biosolids gasification to generate electricity
2. Biosolids composting to produce fertilizer
3. Biosolids enhancement to produce soil conditioner
4. Biosolids application for rubber plantation

Fertilizer/Energy Value

Biogas



Flare

Methane : 65 - 70%
COD : < 25%
N_2: < 5%

Use of biogas for electricity generation at
- Jelutong STP, Penang
- Pantai STP, KL
- Bunus STP, KL

Energy Value

Challenges in Fecal Sludge Management





THANK YOU

TERIMA KASIH

For more info and queries please visit our website:

www.iwk.com.my


IndahWater