

# ON-SITE DOMESTIC WASTEWATER TREATMENT IN MALAYSIA



**NATIONAL WATER SERVICES COMMISSION (SPAN)**

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**SPAN**

# **INTRODUCTION OF ON-SITE TREATMENT SYSTEM IN MALAYSIA**

# OVERVIEW

**Population : 29.24 mil (Urban, Rural )**  
**Area : 330,252 sq. km.**

## MALAYSIA

### COUNTRY AT A GLANCE



Population	29.24 million	2012
GDP	\$303.5 billion	2012
GDP growth	5.6%	2012
Inflation	1.7%	2012



**BUMI –  
PUTRA**  
67.4 %



**CHINESE**  
24.6 %

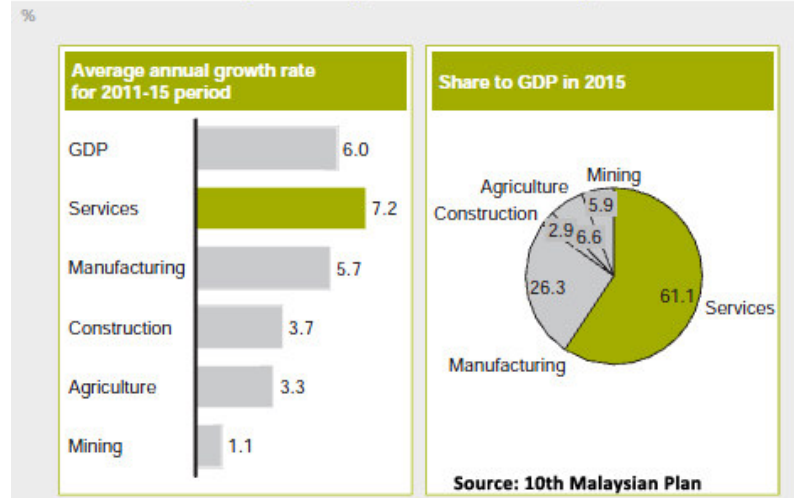


**INDIAN**  
7.3 %



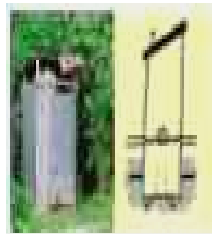
**Others**  
0.7 %

Services sector is expected to grow at 7.2% annually until 2015



# EVOLUTION OF SANITATION IN MALAYSIA

Prior to 1950-s Technology



Pour Flush

Septic Tank

Imhoff Tank

OP/AL

Activated Sludge/ Biological Filters

Fully Mechanised Plant

1950-s

1960-s

1970-s

1980-s

1990-s

2000

Year

Early Days in  
Malaya

Primitive / Primary Treatment

Partial / Full Secondary Treatment

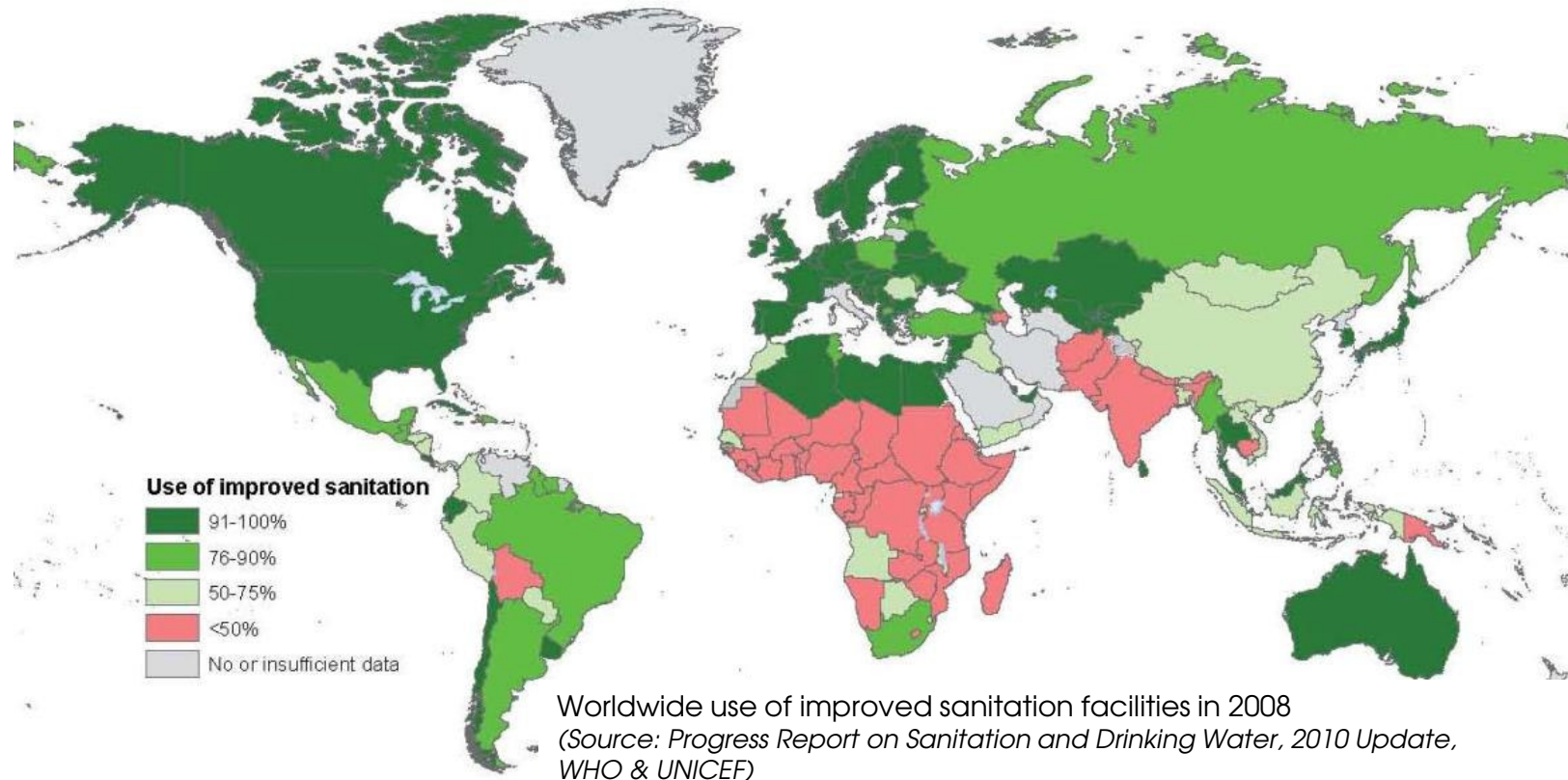
Future Tertiary Treatment

(Address Public Health)

(Address River Pollution)

(Address Environment)

## PROGRESS OF SANITATION IN MALAYSIA



### Population in Malaysia having access to sanitation in 2008

– Urban	:	96%
– Rural	:	95%
– Total	:	96%

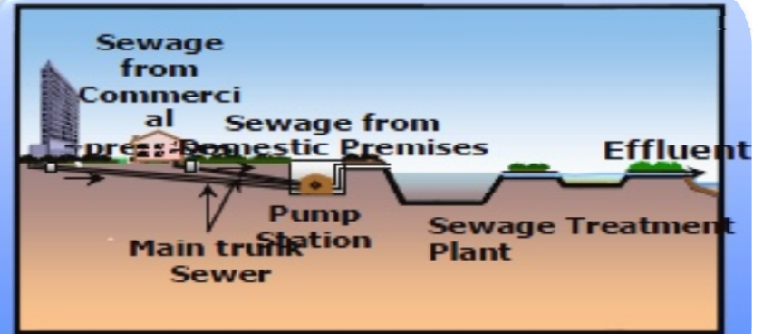
(Source: WHO)

# ON-SITE AND OFF-SITE TREATMENT SYSTEM

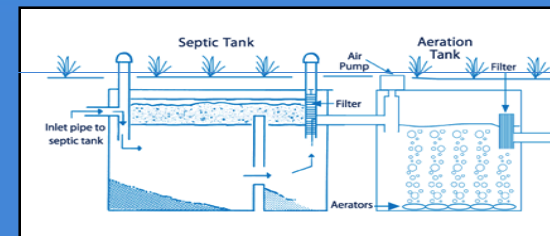


On-site

Off-site



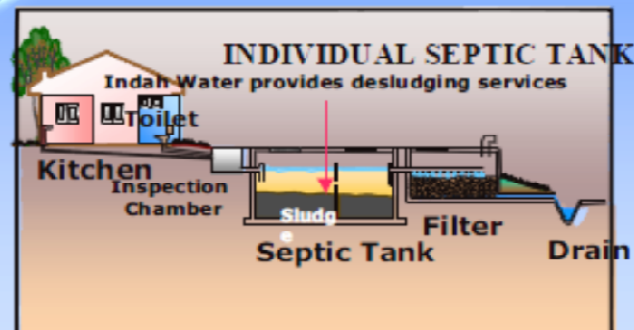
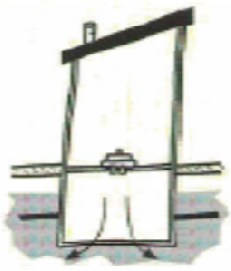
Sewage Treatment System



Small Sewage Treatment System



Cess pit



Individual Septic Tank (include CST)

## SEWERAGE COVERAGE AREA IN MALAYSIA

TYPES OF SERVICES AND APPLICATION	
Type of Services	Units (PE)
<b>OFF-SITE TREATMENT</b>	
Decentralized (Multipoint)	8,445 (17,209,749)
Centralized (Regional)	79 (6,034,593)
<b>ON-SITE TREATMENT</b>	
Individual Septic Tank	1,275,757 (6,608,560)
Communal Septic Tank (CST)	4,380 (528, 875)
Small Sewage Treatment System	2400 <sup>1</sup> (240,000)
Cess Pit (Pour Flush)	894,859 (4,474,293)

\* Source : Malaysia Water Industry Guide 2013

Note : 1. Estimate installation of SSTS since year 2008



## SEWERAGE COVERAGE AREA IN MALAYSIA

OFF SITE TREATMENT SYSTEM CAN BE DIVIDED INTO TWO  
MAJOR CATEGORY

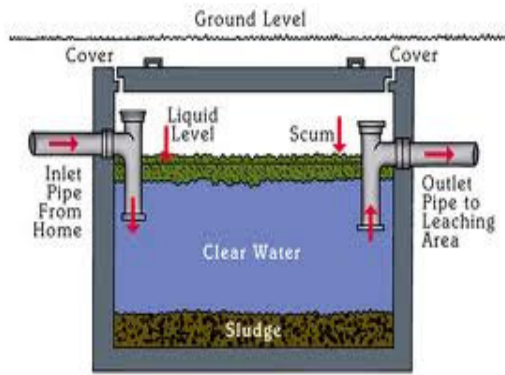
**PRIVATE  
SYSTEM**

2,474 nos  
(2,555,558)

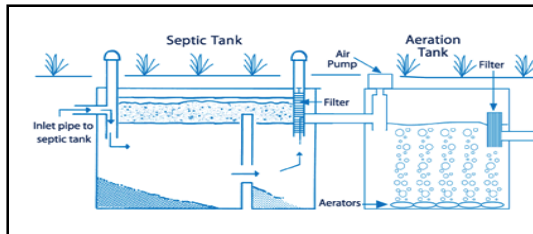
**PUBLIC  
SYSTEM**

6,050 nos  
(20,688,784)





**Septic Tank**



# ON-SITE DOMESTIC TREATMENT

## OVERVIEW

# 4

Type of on-site treatment system

### CESSPIT

An old system  
(Obsolete system)

### INDIVIDUAL SEPTIC TANK

Serving single premises with capacity not more than 30PE,

### COMMUNAL SEPTIC TANK

Obsolete system (serving multi premises)

### SMALL SEWAGE TREATMENT SYSTEM

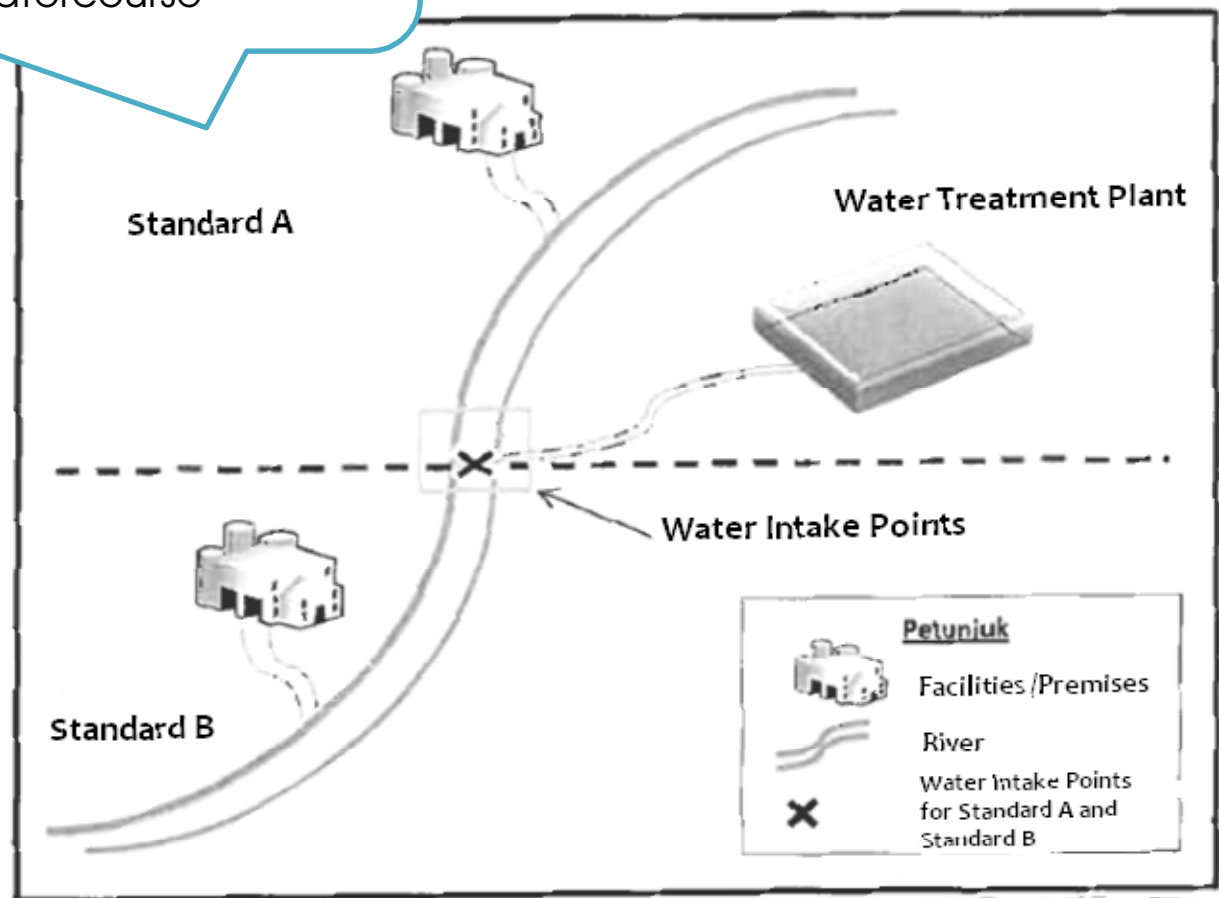
Provide partial treatment

# OVERVIEW

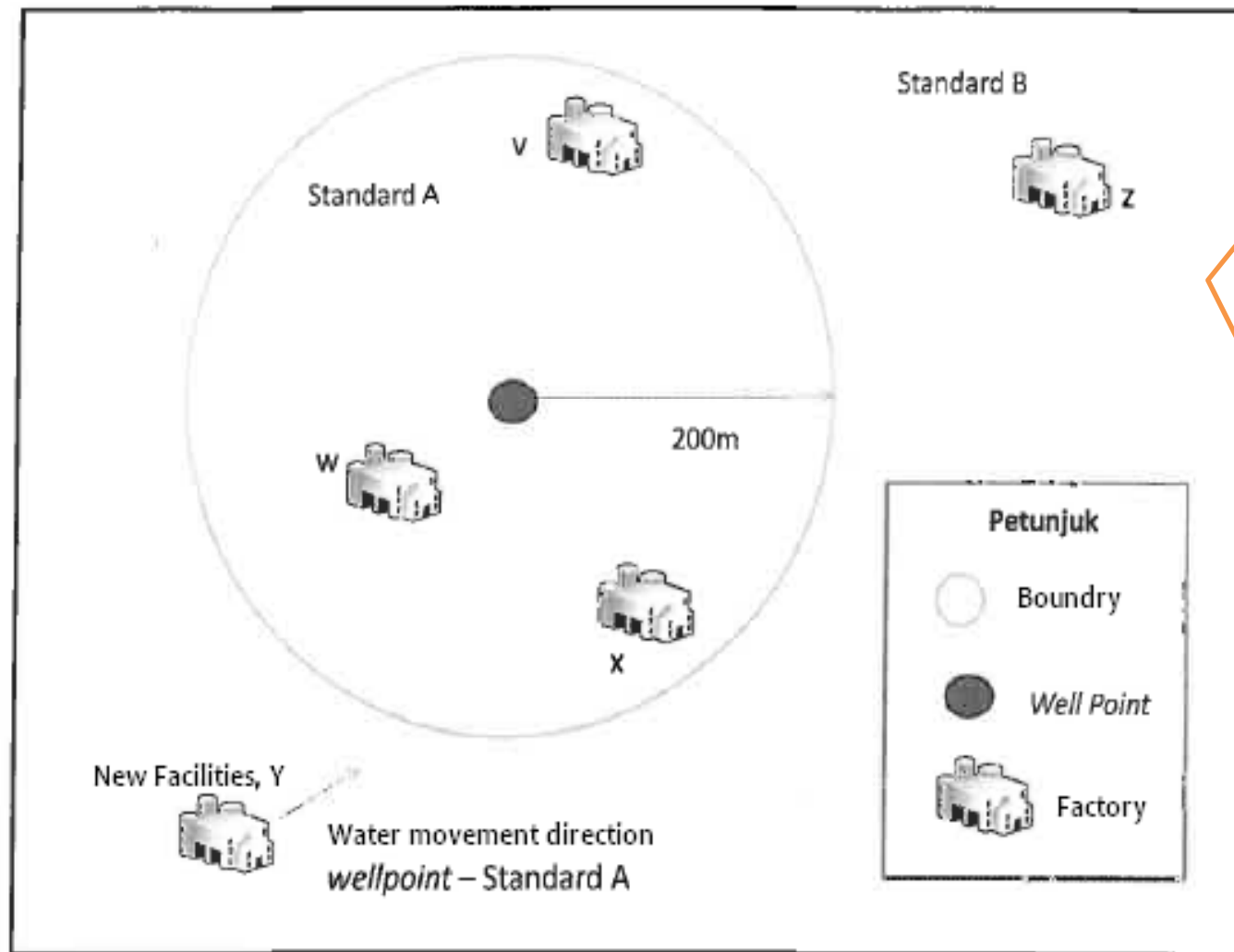
Design standards stringent to achieve effluent quality if :  
Discharge of treated effluent **located upstream**  
**the of water** catchment areas and/or in certain  
sensitive receiving watercourse

## DESIGN CRITERIA

Governed to a large  
extend by the hydraulic  
aspects of treated  
effluent discharge to  
suitable watercourse



# OVERVIEW



If location of the ground water in the premises to be built is moving towards the well field, even though premises is located outside the 200m radius, thus the premise effluent discharge must comply with the Standard A

# INDIVIDUAL SEPTIC TANK

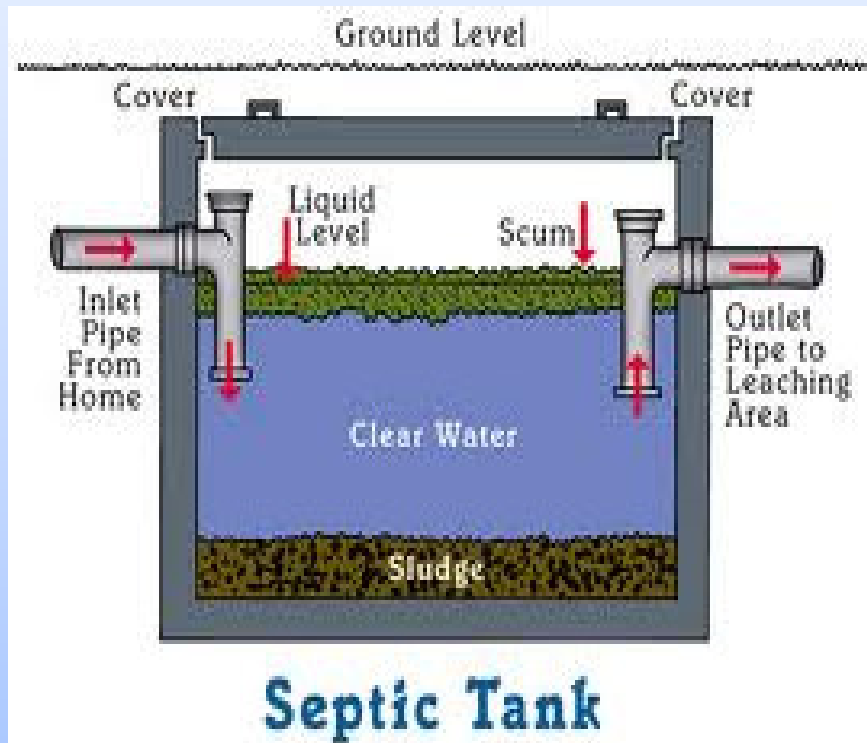


Diagram 1 : Schematic Diagram of Septic Tank

# INDIVIDUAL SEPTIC TANK

## DEFINITION

Definition of septic tank based on Water Services Industry 2006 (Act 655):

**“A basic form of on-site treatment facility consisting of one or more compartments that provides treatment of sewage by means of sedimentation and anaerobic process.”**

## DESIGN CAPACITY

For 5 – 30 PE  
(1.125 – 6.750  
 $\text{m}^3/\text{day}$ )

## APPLICATION

Serving a single premise, with capacity not more than 30PE

Other treatment system shall be provided if the design PE more than 30PE.

# INDIVIDUAL SEPTIC TANK

## LIMITATION

Limitation in providing primary treatment

Treatment performance is inconsistent to meet the required standards

## PERFORMANCE MEASUREMENT

Performance is subjected to retention which is affected by quantity of settled solids which accumulated over time

## EFFLUENT QUALITY

Design for effluent discharge downstream of water intake points

Average effluent quality

- BOD : 50 mg/l
- Suspended Solid : 100 mg/l

## MAINTENANCE OF THE SYSTEM

Design shall allow regular desludging

Desludging shall be at least once every 3 years.



# PLANNING ASPECT OF INDIVIDUAL SEPTIC TANK

## Single Development Up To 30 Units Or 150PE In Total

- Septic tanks regarded as temporary treatment system
- Owner of system shall provide the following
  - 150mm by-pass pipe from last inspection chamber before septic tank
  - By pass pipe extended it to the drain outside the premises
  - The pipe shall be end capped for future connection

### Individual Development Outside The Local Authority Areas

Owners must be compelled to adhere to rules and requirement

- Product must be approved by SPAN
- Complying with determined effluent standard
- Trenches to be provided for final effluent discharge
- Raised soak away shall be provided if water table is high
- Desludging activities must be provided by registered desludging contractor

All soak away shall be located 5m downstream of wells for domestic consumption

# SMALL SEWERAGE TREATMENT SYSTEM

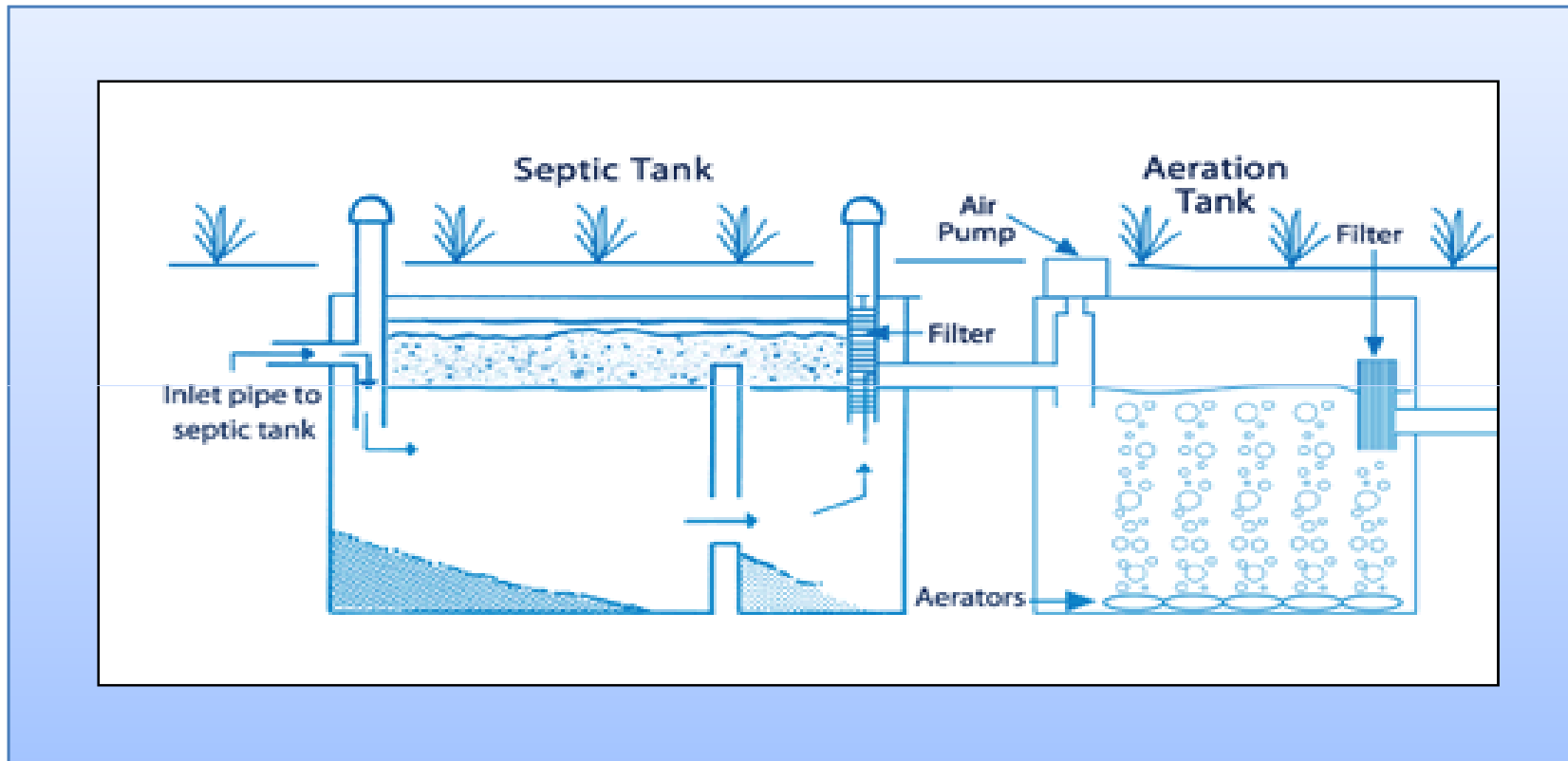


Diagram 2 : Schematic Diagram of SSTS

# SMALL SEWERAGE TREATMENT SYSTEM

DESIGN CAPACITY For 31 – 149 PE  
(6.975 – 33.525 m<sup>3</sup>/day)

## TREATMENT PRINCIPLES:

Limited to development with lower population size

Additional aeration process at the second tank for removal of BOD

Provide only a partial treatment

Low energy consumption

The function of key components does not require intensive energy and technical ability for operation

# SEWAGE CHARACTERISTICS AND EFFLUENT QUALITY

COMPONENT	PE RANGE	CAPACITY RANGE (m <sup>3</sup> /day)	PARAMETER/CONCENTRATION (mg/l)						
			BOD	COD	SS	TN	NH3-N	Oil & Grease	P*
<b>(IDEAL) INFLUENT</b>	All	All	250	500	300	50	30	50	
<b>EFFLUENT</b>			BOD	COD	SS	NO3-N	NH3-N	Oil & Grease	P*
<b>INDIVIDUAL SEPTIC TANK</b>	5 - 30	1.12 – 6.75	50	200	100	N/A	N/A	N/A	N/A
<b><sup>2</sup>SMALL SEWAGE TREATMENT SYSTEM</b>	31 - 149	6.97 – 33.52	35	160	75	N/A	N/A	7.5	10

## CHALLENGES IN DETERMINING THE DESIGN INFLUENT PARAMETERS

The influent parameter in Malaysia mostly diluted due to infiltration and illegal discharges from rain gutter

Note :

1 Only applicable for effluent discharge to stagnant water bodies such as lakes and ponds

2 The proposed effluent parameters for SSTs

# ADVANTAGE & DISADVANTAGE OF ON-SITE TREATMENT SYSTEM



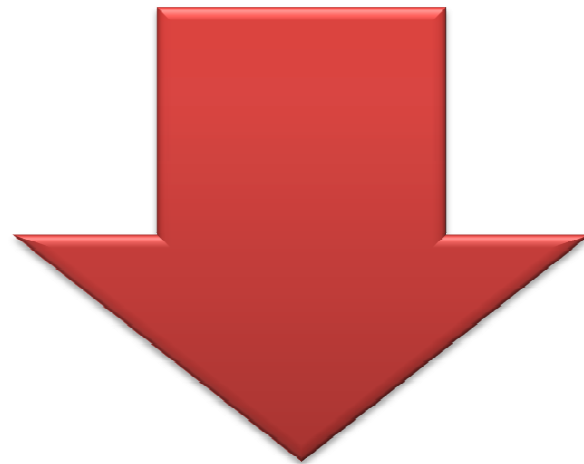
## ADVANTAGES

- Low installation cost
- Easy installation
- Serving a single premise



## DISADVANTAGE

- Inconsistent treatment performance
- Require regular desludging frequency of once every 3 years
- Capacity allowed only up to 30PE
- Lacking of Enforcement





# **CHALLENGES**

# DESLUDGING TREND IN MALAYSIA

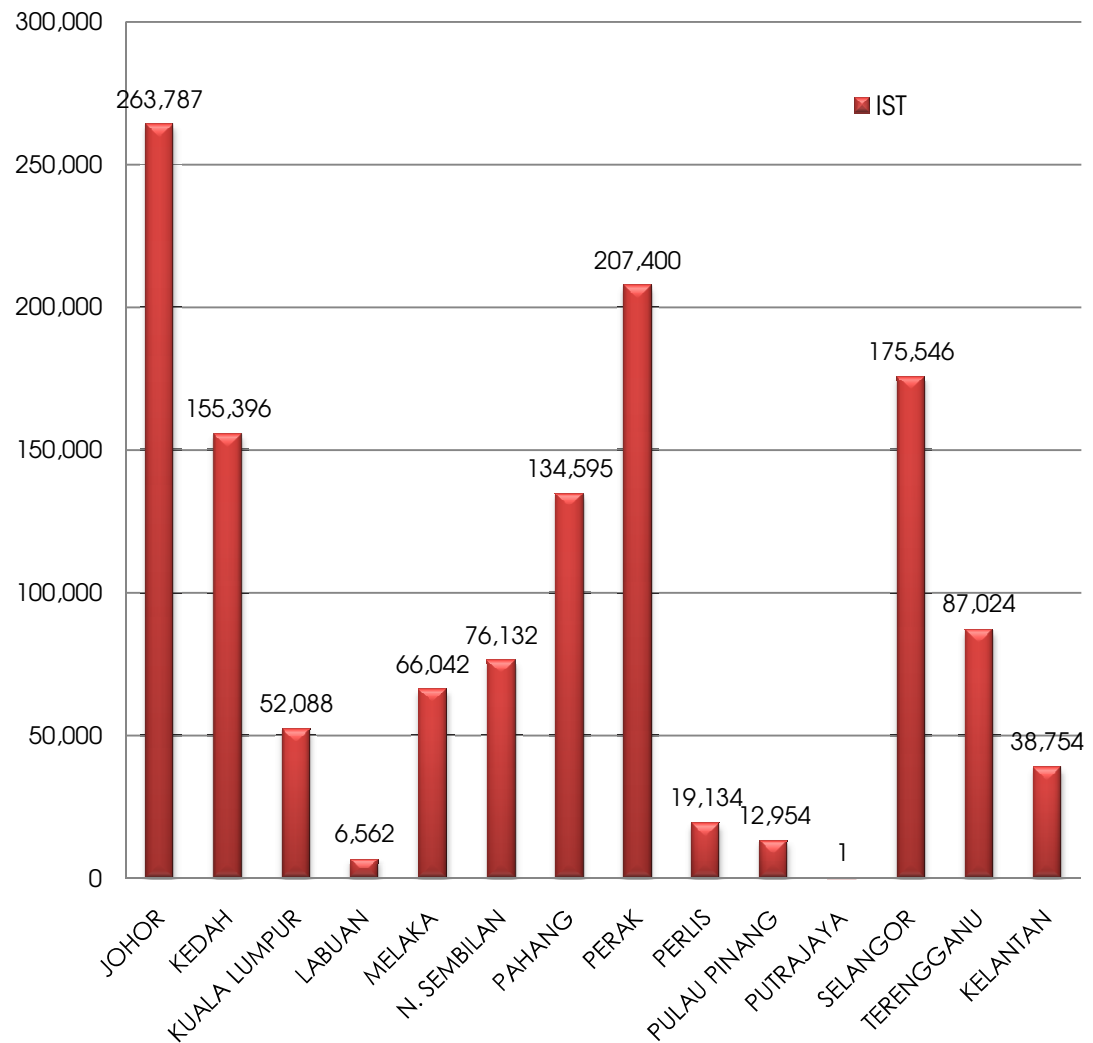
## BACKGROUND

In January 2008, Water Services Industry Act 2006 became enforceable

Responsibility of desludging individual septic tank falls under the owner

Prior to WSIA mandatory scheduled desludging was in place

Chart 2: Number of ISTs in Peninsular Malaysia and Federal Territories of Putrajaya and Labuan





# DESLUDGING TREND IN MALAYSIA

## KEY ISSUES

Unbearable stench permeating the air

Malfunctioning of toilets, sinks and sanitary pipes

Higher risk of being confronted with water borne diseases

Quality of water resource will be affected

## AWARENESS PROGRAMME

Campaign being held through Malaysia to encourage Malaysian desludging their IST.

The message brought to public to address **key issues** and awareness in desludge their septic tanks :

ADVERTORIAL

### WHY DESLUDGING SEPTIC TANKS IS IMPORTANT

**What are Individual Septic Tanks (IST)?**

An individual septic tank (IST) is widely used in Malaysia as a method of treating domestic sewage. It can be found within domestic, commercial and industrial premises.

The easiest way to confirm whether you have an IST is by identifying the tank covers around the premises. An individual tank has two or three covers in parallel to each other.

**Desludging Trend in Malaysia**

Since January 2008, when the Water Services Industry Act 2006 [Act 655] became enforceable, the responsibility to desludge ISTs was handed over to the property owners. Previously, Tadris Water Konsortium Sdn. Bhd. or TWK used to provide scheduled desludging of ISTs.

However, since then, there has been a substantial decline in the overall exercise of septic tank desludging as shown in the chart below:

Year	Number of ISTs Desludged
2005	135,000
2006	130,000
2007	125,000
2008	40,000
2009	35,000
2010	30,000
2011	40,000

**What Happens When You Don't Desludge**

1. Unbearable stench permeating the air
2. Malfunctioning of toilets, sinks and sanitary pipes
3. Higher risk of being confronted with water borne diseases such as cholera and typhoid
4. Quality of water resource, for example rivers/lake/ponds will be affected.

**How Often Do You Desludge**

1. In principle, desludging must be done once in every three years.
2. In Peninsular Malaysia, two major operators are licensed to provide desludging services, namely TWK and Majlis Services Sdn. Bhd. (Majlis Services).

More contractors will be able to provide desludging services in future when the demand for such service increases. These contractors will be given Permit 1 by National Water Services Commission (NWSC) to provide the service.

For more information about desludging services, please contact TWK at 1-800-88-1495 (for all Peninsular Malaysia states except Perlis) or Majlis Services at 09-747 0905 (for Kelantan).

The list of other contractors (Permit 2 holders) is available at [www.span.gov.my](http://www.span.gov.my) under the heading "Register" and "Permit".

**NOTICE TO PROPERTY OWNERS:** As per the regulations and the provisions in the National Water Services Commission (NWSC) Act 2006.

This message has been brought to you in conjunction with the launching of our nationwide Septic Tank Desludging Awareness Campaign on 16 June 2011 in Muar, Johor.

Desludging in Progress

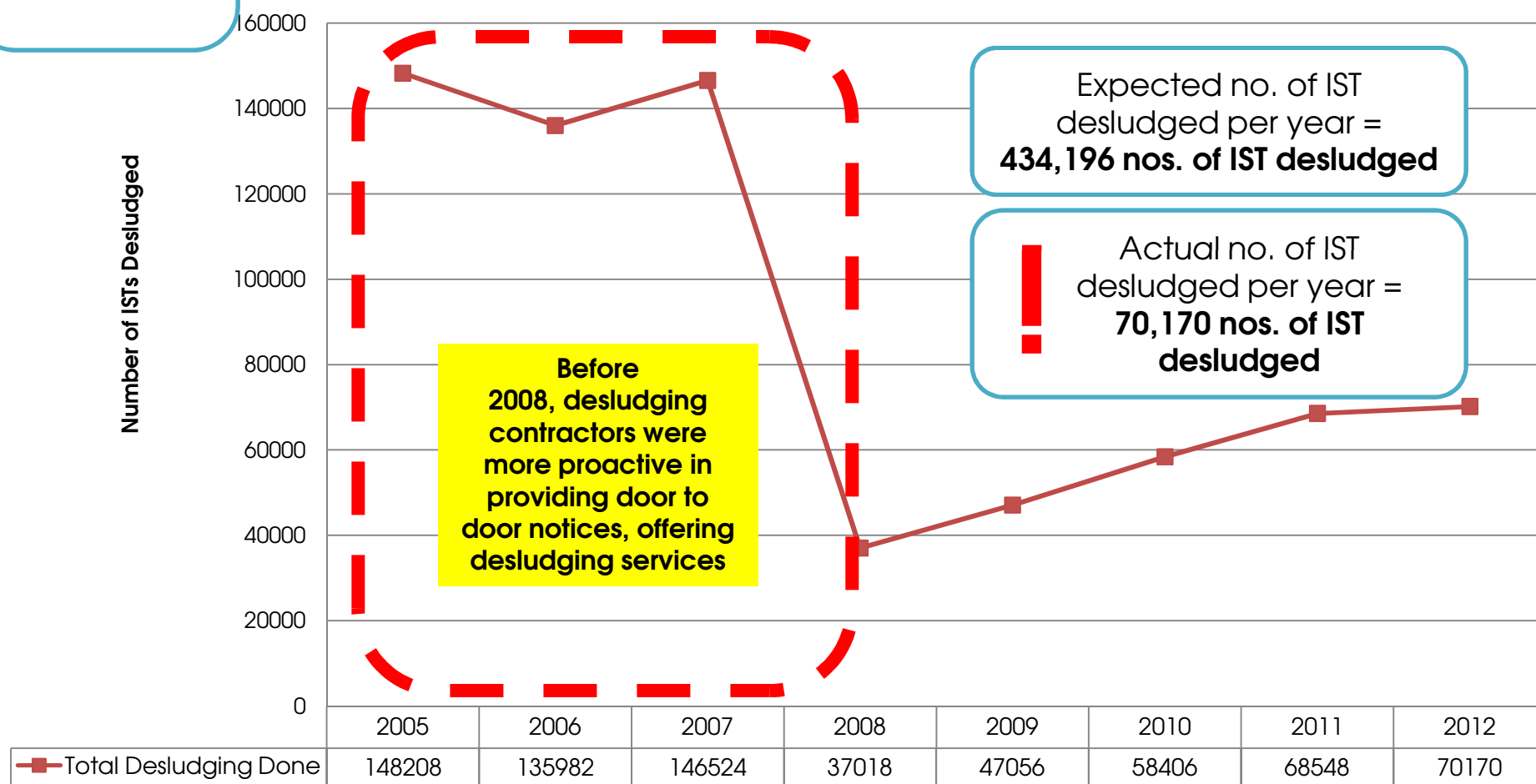
Desludging Tank

**SPAN**  
Suruhanjaya Persekitaran Air Negara

# DESLUDGING TREND IN MALAYSIA

A substantial decline in exercise as shown

## CHART 1: INDIVIDUAL SEPTIC TANK (IST) DESLUDGING TREND (2005 - 2012)



## DESLUDGING TREND IN MALAYSIA

Two major contractor are licensed by SPAN to provide desludging services

Indah Water  
Konsortium  
Berhad



Majaari Services  
Sdn Bhd



Desludging activities can only be carried out by Permit E contractor registered by SPAN

APPLY PERMIT  
CLICK HERE

**SPAN**  
e-permit

PERMIT HOLDER	PERMIT	DECSRIPTION	NOs
Plumber	A	to carry out any construction of, connection of, modification of or repairs to water pipes and water fittings which convey or will convey water from the public mains	13,186
Contractor	B	to carry out any works necessary to connect a private connection pipe to a sewer or sewage treatment works	941
	C	to carry out any construction of, installation of or modification to any part of a water supply or sewerage system	11,882
	D	to carry out maintenance services for a water supply system or a sewerage system but which does not involve the operation of such system	8,683
	E	to undertake, provide or make available sewerage desludging service	388
	<b>Total</b>		<b>35,080</b>



Suruhanjaya Perkhidmatan Air Negara



# THANK YOU

NATIONAL WATER SERVICES  
COMMISSION (SPAN)

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