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# FINAL REPORT

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INTERNATIONAL STUDY VISIT FOR PT KOGAS DRIYAP  
KONSULTAN (METROPOLITAN SANITATION  
MANAGEMENT INVESTMENT PROJECT)



INDAH WATER TRAINING CENTRE  
KUALA LUMPUR, MALAYSIA

**FINAL REPORT  
BY  
INDAH WATER TRAINING CENTRE**

**ABSTRACT**

To provide key personnel and technical staff of Local Governments with training and insights on operation and maintenance of Sewerage Treatment Plants as well as exposure on Malaysia's wastewater management with Indah Water Konsortium Sdn. Bhd.. Malaysia.

**INTRODUCTION**

The main goal for this training course is:

1. Provide an interactive two way method in ensuring the best practice to use for the management of treatment plant between IWK and Kogas
2. Provide training and insights on operation and maintenance of sewerage treatment plants
3. To give exposure on Malaysia's wastewater management
4. To identify process and manage practices with planned sewerage schemes

**TRAINING NAME**

Basic Operation and Maintenance of Sewerage Treatment Plants, International Study Visit for PT Kogas Driyap Konsultan, Indonesia (Metropolitan Sanitation Management Investment Project)

**TOPICS OF THE COURSE**

1. Introduction, Overview, Operations, Co-treatment I Centralised Sludge Treatment
2. Treatment Plant Approval Processes, Customer atabase, Customer Relations, Billing and Collection, Business/Financial Models, Tariff, Costs, Revenue for Connected of Septic Tank
3. Operations, Maintenance, Centralised Sludge Treatment
4. Troubleshooting and Process Control
5. Sludge Management, Desludging, Transport, Planning, Sludge Treatment, Desludging Activity/Septic Tank Construction, Geo bag and Drying bag
6. Site Visit and Demonstration

**DATE AND PERIOD**

Group 1: 23-24 May 2019 (2 days)

Group 2: 27-31 May 2019 (5 days)

**PLACE OF TRAINING**

The activity took place at the Indah Water Training Centre, Bukit Jalil and various treatment plants in Kuala Lumpur and Melaka

## METHODOLOGY OF TRAINING

The training focused on applied and practical methods by using the following concepts:

- Brainstorming regards the definition of role in leading and developing the treatment plant.
- Presenting the subjects by involving the trainees in discussion and encouraging knowledge transfer.

## POSITIVE ASPECT OF THE TRAINING

- The participants were interested and enthusiastic about all the subject.
- The instruction followed a democratic system in managing their sessions.
- The participants have gained reasonable skills experiences which will enable them to operate and maintain the treatment plant.

## METHOD OF TRAINING

- Evaluation each meeting by participants.
- Collective interactions.
- Discussion groups, mini.
- Practical exercises, individually and collectively.

## EVALUATION

Training has been evaluated by the participants through evaluation forms and the results were very satisfactory. Among remarks from participants are as follows:

Details	Marks
Course Objectives	<ul style="list-style-type: none"><li>• 91% (relevant to the workplace)</li><li>• 100% (Material)</li><li>• 95% (Quality of learning material)</li></ul>
Trainer	<ul style="list-style-type: none"><li>• 87% (Presentation)</li><li>• 100% (Expertise)</li></ul>
Logistics, Venue and Food	<ul style="list-style-type: none"><li>• 91% (Training organized)</li><li>• 100% (Venue)</li><li>• 100% (Facilities up to standard)</li><li>• 87% (Food and Beverages)</li><li>• 90% (Accommodation)</li></ul>
Overall Perceptions	<ul style="list-style-type: none"><li>• 91% (Overall Course)</li><li>• 95% (Relevance to Work)</li></ul>
Remarks (Further Improvement)	
<ul style="list-style-type: none"><li>• Past experience gained by the staff may be shared with us.</li><li>• Similar type of training is required for collection sewer network</li><li>• Motivation and attitude changing sessions also should add every day. Some ground works also is better to keep the audience alive.</li></ul>	
<ul style="list-style-type: none"><li>• It is interesting, the modify presentation method. in insert more videos, clips etc may very much interesting</li></ul>	

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| <ul style="list-style-type: none"><li>• It will be helpful if you can arrange some related video clips with the presentation</li></ul>   |
| <ul style="list-style-type: none"><li>• More time should be allocated</li><li>• It will be complete if you can arrange a site visit with showing identification of some hazardous.</li></ul> |

### ATTACHMENTS

1. The schedule of the training course.
2. Copy of the training attendance
3. Copy of certificates
4. Pictures

Prepared by:  
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INTERNATIONAL VISIT ON BASIC OPERATION AND MAINTENANCE OF  
SEWERAGE TREATMENT PLANT FOR METROPOLITAN SANITATION  
MANAGEMENT INVESTMENT PROJECT  
Indah Water Konsortium Sdn. Bhd., Malaysia  
GROUP 1 (23<sup>rd</sup> – 24<sup>th</sup> MAY 2019)

Day 0 (Wednesday, 22 <sup>nd</sup> May 2019)		
Arrival at KUALA LUMPUR, MALAYSIA		
Day 1 (Thursday, 23 <sup>rd</sup> May 2019) - INTRODUCTION, OVERVIEW, OPERATIONS, CO-TREATMENT / CENTRALISED SLUDGE TREATMENT – Pantai 2 & IWTC		
08.00	08.30	Travel to Pantai 2
08.30	11.30	Site Visit Pantai 2 Regional Sewage Treatment Plant. Biggest underground plant in South East Asia
11.30	12.00	Travel to Indah Water Training Centre (IWTC)
12.00	13.30	<b>Q&amp;A and photo session with Business Development Department, Chief Operating Officer (COO) and Chief Executive Officer (CEO) and Light Lunch with Leaders</b>  Planning consulting between Indah Water Konsortium Sdn. Bhd. (IWK) and PT Kogas Driyap Konsultan
13.30	17.00	<b>Brief Presentations : City Status, Expectation</b> <b>Introduction to the Program</b> Presenter: Suriya A/L Narhayhanen  <b>Overview of Malaysian Sewerage / Sanitation Journey</b> <b>Discussion on Technology, Overview of Operations, SOPs, IT Systems, Wastewater Management in Malaysia: Lesson Learnt</b> <b>Q&amp;A</b> (If enough time, visit to RSTP Sg. Besi and Central Laboratory Facilitation: SK Chan / Dr. Leong / Munirafiq / Suriya) Coffee and Tea will be provided in the afternoon
Day 2 (Friday, 24 May 2019) – IWTC		
8.00	8.30	Travel to IWTC
8.30	12.30	<b>Certifying Agency: Treatment Plant Approval Processes; Customer Database, Customer Relations, Billing and Collection; Business / Financial Models, Tariff, Costs, Revenue for Connected or Septic Tank</b> Presenters: Ir. Zakariah, Certifying Agency; Shahrulbariah, Customer Billing and Collections Department; Lim Choon Line, Finance
12.30	13.30	Lunch and Closing











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GROUP 2 (27<sup>th</sup> – 31<sup>st</sup> May 2019)**

<b>Day 0 (Sunday, 26<sup>th</sup> May 2019)</b>		
<b>Arrival at KUALA LUMPUR, MALAYSIA</b>		
<b>Day 1 (Monday, 27<sup>th</sup> May 2019) - Introduction, Overview, Operations, co-treatment Trainer: J. Kulasegaran Jayabalan</b>		
09.00	09.30	Introduction to program
09.30	10.45	<b>Introduction to Operation and Maintenance of Sewerage System</b> <ul style="list-style-type: none"> <li>- Sewage Source and Treatment</li> <li>- Sewerage Systems in Malaysia</li> <li>- Mechanised System</li> </ul>
10.45	11.00	<b>Tea / Coffee Break</b>
11.00	13.00	<b>Preliminary Treatment</b> <ul style="list-style-type: none"> <li>- Treatment Process Overview</li> <li>- Preliminary Treatment- Solid Removal</li> <li>- Grit Removal From Sewage</li> <li>- Oil &amp; Grease Removal From Sewage</li> <li>- Type of Installation</li> </ul> <b>Primary Treatment</b> <ul style="list-style-type: none"> <li>- Treatment Process Overview</li> <li>- Objectives</li> <li>- Types of treatment</li> </ul>
13.00	14.00	<b>Lunch</b>
14.00	15.30	<b>Secondary Treatment</b> <ul style="list-style-type: none"> <li>- Treatment Process Overview</li> <li>- Types of Secondary Treatment</li> <li>- Secondary Clarifier</li> </ul>
15.30	15.45	<b>Tea / Coffee Break</b>
15.00	17.00	<b>Common Operational Issues</b> <ul style="list-style-type: none"> <li>- Operational Issues</li> <li>- Issues with Preliminary Process Units</li> </ul>
<b>Day 2 (Tuesday, 28<sup>th</sup> May 2019) – Operations, Maintenance, centralised sludge treatment Trainer: J. Kulasegaran Jayabalan</b>		
09.30	10.30	<b>Maintenance system and Operations</b> <ul style="list-style-type: none"> <li>- Principle Objectives</li> <li>- Types of Maintenance</li> </ul>
10.30	10.45	<b>Tea / Coffee Break</b>
10.45	11.30	<b>Maintenance system and Operations (Cont.)</b> <ul style="list-style-type: none"> <li>- Scheduled Maintenance</li> <li>- Advantages of PM</li> <li>- Predictive Maintenance</li> <li>- Maintenance Strategy</li> </ul>

11.30	12.30	<b>Sludge Management</b> <ul style="list-style-type: none"> <li>- Sludge Treatment</li> <li>- Sludge Thickening</li> <li>- Sludge Digestions</li> <li>- Equipment</li> </ul>
12.30	13.30	<b>Lunch</b>
13.30	14.00	Safety Briefing for Site Visit
14.30	16.30	<b>Site Visit to Regional Sewage Treatment Plant KL-Sg.Besi</b>
16.30		<b>Tea / Coffee Break</b>
<b>Day 3 (Wednesday, 29<sup>th</sup> May 2019) – Troubleshooting and Process Control</b> <b>Trainer: Zufadli Chailan</b>		
09.30	10.30	<b>Introduction on Troubleshooting Process</b> <b>Overview</b> <ul style="list-style-type: none"> <li>- Sewage Treatment Systems</li> <li>- Stages in Treatment</li> <li>- Biological Process</li> </ul>
10.30	10.45	<b>Tea / Coffee Break</b>
10.45	12.30	<b>Process Control and Troubleshooting of Activated Sludge Process</b> <ul style="list-style-type: none"> <li>- Benefits of Process Control and Monitoring</li> <li>- Process Monitoring and Control</li> <li>- Tank Observation</li> <li>- Measuring pH</li> <li>- Measuring Dissolved Oxygen</li> <li>- Sludge Settleability</li> <li>- Microscopic Test</li> </ul>
12.30	14.00	<b>Lunch</b>
14.00	16.30	<b>Process Control and Troubleshooting of Fixed Film Process</b> <ul style="list-style-type: none"> <li>- Types of Fixed Film Systems</li> <li>- Inspection and Observations</li> <li>- Recirculation / Recycle</li> <li>- Inspection and Observation</li> <li>- Field Tests</li> <li>- Common Problems</li> </ul>
16.30		<b>Tea / Coffee Break</b>
<b>Day 4 (Thursday, 30<sup>th</sup> May 2019) – IWK Melaka Reporting Centre, MITC</b>		
07.00	09.00	<b>Travel to Melaka</b>
09.00	12.30	<b>Briefing on Sludge Management, Desludging, Transport, Planning, Sludge Treatment, Desludging activity / Septic Tank Construction</b> <b>Geobag, Drying Bed</b>
12.30	14.00	<b>Lunch</b>
14.00	14.30	<b>Travel to Sg. Udang Centralised Sludge Treatment Facility (CSTF)</b>
14.30	17.00	<b>Site Visit: Co.Treatment, Mechanised Dewatering</b> <ul style="list-style-type: none"> <li>• <i>Wee Soon Guan / Tay Yi Zhen/ Ahmad Razak Jofri</i></li> </ul>
17.00		<b>Travel to Kuala Lumpur</b>

<b>Day 5 (Friday, 31<sup>st</sup> May 2019) – IWK Regional Sewerage Treatment Plant Pantai 1, Kuala Lumpur</b>		
08.00	09.00	<b>Travel to Pantai 1, Kuala Lumpur</b>
09.00	09.30	<b>Safety Briefing</b>
09.30	11.00	<b>Site Visit and Demonstration – Operations</b>
11.00	11.30	<b>Tea / Coffee Break</b>
11.30	13.30	<b>Site Visit and Demonstration – Scada Room</b>
13.30	14.30	<b>Lunch</b>
14.30	16.30	<b>Review of Visit, discussions, Q&amp;A and further actions</b>
16.30		<b>Tea Break and Back to Hotel</b>











