



JABATAN ALAM SEKITAR DEPARTMENT OF ENVIRONMENT

KEMENTERIAN TENAGA, SAINS, TEKNOLOGI, ALAM SEKITAR DAN PERUBAHAN IKLIM
MINISTRY OF ENERGY, SCIENCE, TECHNOLOGY, ENVIRONMENT AND CLIMATE CHANGE

LAPORAN TAHUNAN *Annual Report* **2018**



LAPORAN TAHUNAN

Annual Report

2018



Department of Environment, Malaysia

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Edited by:

Publications Section
Strategic Communications Division
Department of Environment
Malaysia

ISSN 2636-9842

Design and Printed by

OMR Press Sdn. Bhd.
No.18, Jalan Industri USJ 1/12,
Taman Perindustrian USJ 1,
47600 Subang Jaya, Selangor Darul Ehsan
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SINGKATAN ABBREVIATIONS

ADB	Bank Pembangunan Asia	Asian Development Bank
AEY	Tahun Alam Sekitar ASEAN	ASEAN Environment Year
AKAS	Akta Kualiti Alam Sekeliling	Environmental Quality Act
AMME	Mesyuarat Menteri-Menteri ASEAN Mengenai Alam Sekitar	ASEAN Ministerial Meeting on the Environment
ASEAN	Pertubuhan Negara-Negara Asia Tenggara	Association of South East Asian Nations
ASOEN	Pegawai Kanan Alam Sekitar ASEAN	ASEAN Senior Officials on the Environment
AWASI	Area Watch and Sanction Inspection	Area Watch and Sanction Inspection
BT	Buangan Terjadual	Scheduled Wastes
BIMP	Brunei-Indonesia-Malaysia-Filipina	Brunei-Indonesia-Malaysia-Philippines
BOD	Keperluan Oksigen Biokimia	Biochemical Oxygen Demand
BPO	Bahan Pemusnah Ozon	Ozone Depleting Substances
CA	Udara Bersih	Clean Air
CETDEM	Pusat bagi Alam Sekitar, Teknologi dan Pembangunan Malaysia	Centre For Environmental, Technology and Development Malaysia
CFC	Kloroflourokarbon	Chlorofluorocarbon
CICM	Majlis Industri Kimia Malaysia	Chemical Industries Council of Malaysia
CMC	Pusat Pengurusan Pantai	Coastal Management Centre
COBSEA	Badan Penyelaras Mengenai Laut Asia Timur	Co-ordinating Body for the Seas of East Asia
COD	Keperluan Oksigen Kimia	Chemical Oxygen Demand
CPO	Kelapa Sawit Mentah	Crude Palm Oil
DB	Desibel	Decibel (s)
DOE	Jabatan Alam Sekitar	Department of Environment
DOKUMAS	Sistem Pengurusan Dokumen	Document Management System
EAGA	Kawasan Pertumbuhan ASEAN Timur	East ASEAN Growth Area
E.COLI	Escherichia coli	Escherichia coli
EEZ	Zon Ekonomi Eksklusif	Exclusive Economic Zone
EIA	Penilaian Kesan Kepada Alam Sekeliling	Environmental Impact Assessment
EPSM	Persatuan Perlindungan Alam Sekitar Malaysia	Environment Protection Society of Malaysia
EPU	Unit Perancang Ekonomi	Economic Planning Unit
EQC	Majlis Kualiti Alam Sekeliling	Environmental Quality Council
EQR	Laporan Kualiti Alam Sekeliling	Environmental Quality Report
ESCAP	Pesuruhjaya Ekonomi & Sosial Asia Pasifik	Economic & Social Commission for Asia and the Pacific
EIMAS	Institut Alam Sekitar Malaysia	Environment Institute of Malaysia
EXCO	Ahli Mesyuarat Kerajaan Negeri	Executive Councillors
FMM	Persatuan Pekilang-Pekilang Malaysia	Federation of Malaysian Manufacturers
FOMCA	Persatuan Pertubuhan Pengguna-Pengguna Malaysia	Federation of Malaysian Consumer's Association
FRIM	Institut Penyelidikan Hutan Malaysia	Forest Research Institute of Malaysia

FRTM	Gabungan Persatuan-Persatuan Perdagangan Getah Malaysia	Federation of Rubber Trade Association of Malaysia
GEF	Kemudahan Alam Sekitar	Global Environment Facility
GIS	Sistem Maklumat Geografik	Geographical Information System
HCFC	Hidro Klorofluorokarbon	Hydro Chlorofluorocarbon
ICZM	Pengurusan Zon Pantai Bersepadu	Integrated Coastal Zone Management
HSU	Unit Asap Hartridge	Hartridge Smoke Unit
IDHL	Institut Diplomasi & Hal Ehwal Luar	Institute of Diplomacy & Foreign Relations
IKAN	Indeks Kualiti Air Negara	National Water Quality Index
IMO	Organisasi Maritim Antarabangsa	International Maritime Organisation
INFOTERRA	Sistem Rujukan Antarabangsa Untuk Sumber-Sumber Maklumat Mengenai Alam Sekitar	International Referral System for Sources of Environmental Information
INTAN	Institut Tadbiran Awam Negara	National Institute of Public Administration
IPCS	Program Antarabangsa mengenai Keselamatan Bahan Kimia	International Programme on Chemical Safety
IRPTC	Pendaftaran Antarabangsa bagi Bahan Kimia yang Berpotensi Berbahaya	International Register of Potentially Toxic Chemicals
ISIS	Institut Kajian Strategik dan Antarabangsa	Institute of Strategic and International Studies
JICA	Agensi Kerjasama Antarabangsa Jepun	Japan International Co-operation Agency
JPA	Jabatan Perkhidmatan Awam	Public Service Department
JPS	Jabatan Pengairan dan Saliran Malaysia	Department of Irrigation and Drainage Malaysia
MOSTI	Kementerian Sains, Teknologi & Inovasi	Ministry of Science, Technology and Innovation
KEEP	Perindustrian Kumbahan & Effluen-Effluen	Sewage & Industrial Effluents
KKSM	Kilang Kelapa Sawit Mentah	Crude Palm Oil Mill
MAC	Penyaman Udara Kenderaan	Mobile Air Conditioning
MACRES	Pusat Remote Sensing Malaysia	Malaysian Remote Sensing Agency
MASM	Minggu Alam Sekitar Malaysia	Malaysia Environment Week
MEXCOE	Menteri dan Ahli Majlis Mesyuarat Kerajaan Negeri yang Bertanggungjawab ke atas Alam Sekitar	Ministers and State Executive Councillors Responsible for Environmental Matters
MICCI	Dewan Perdagangan dan Industri Antarabangsa Malaysia	Malaysian International Chamber of Commerce and Industry
MIER	Institut Penyelidikan Ekonomi Malaysia	Malaysian Institute of Economic Research
MINT	Institut Teknologi Nuklear Malaysia	Malaysia Institute of Nuclear Technology
MMVAA	Persatuan Pemasang Kenderaan Bermotor Malaysia	Malaysian Motor Vehicle Assemblers' Association
MNS	Persatuan Pencinta Alam Malaysia	Malaysian Nature Society
MITI	Kementerian Perdagangan Antarabangsa Dan Industri	Ministry of International Trade and Industry
MPOA	Pertubuhan Kelapa Sawit Malaysia	Malaysian Palm Oil Association
MOA	Kementerian Pertanian	Ministry of Agriculture
MOH	Kementerian Kesihatan	Ministry of Health
MOHR	Kementerian Pembangunan Sumber Manusia	Ministry of Human Resources
MOT	Kementerian Pengangkutan	Ministry of Transport
MOU	Memorandum Persefahaman	Memorandum of Understanding



MRPC	Majlis Pengeluar-Pengeluar Getah Malaysia	Malaysia Rubber Products Manufacturers' Council
MSJCE	Jawatankuasa Bersama Malaysia-Singapura Mengenai Alam Sekitar	Malaysia – Singapore Joint Committee on the Environment
NGO	Pertubuhan Bukan Kerajaan	Non-Governmental Organisation
NRE	Kementerian Sumber Asli Dan Alam Sekitar	Ministry of Natural Resources and Environment
NH3N	Amoniakal Nitrogen	Ammoniacal Nitrogen
OECD	Pertubuhan Kerjasama Ekonomi dan Pembangunan	Organisation for Economic Co-operation and Development
PEMSEA	Pertubuhan Kerjasama Alam Sekitar bagi Laut Asia Timur	Partnership in Environmental Management for the Seas of East Asia
PIC	Kebenaran Maklumat Awal	Prior Informed Consent
POMA	Persatuan Pekilang-Pekilang Minyak Kelapa Sawit Malaysia	Palm Oil Millers' Association
PORIM	Institut Penyelidikan Minyak Kelapa Sawit	Palm Oil Research Institute of Malaysia
RM	Ringgit Malaysia	Ringgit Malaysia
RRIM	Institut Penyelidikan Getah Malaysia	Rubber Research Institute of Malaysia
SBC	Urusetia Konvensyen BASEL	Secretariat for BASEL Convention
SIDA	Agensi Pembangunan Antarabangsa Sweden	Swedish International Development Agency
SIRIM	Institut Standard dan Penyelidikan Industri Malaysia	Standards Industrial Research Institute of Malaysia
UB	Udara Bersih	Clean Air
UKM	Universiti Kebangsaan Malaysia	National University of Malaysia
UM	Universiti Malaya	University of Malaya
UNCED	Persidangan Bangsa-Bangsa Bersatu Mengenai Alam Sekitar dan Pembangunan	United Nations Conference on Environment and Development
UNDP	Program Pembangunan Bangsa-Bangsa Bersatu	United Nations Development Programme
UNEP	Program Alam Sekitar Bangsa-Bangsa Bersatu	United Nations Environment Programme
UNITEN	Universiti Tenaga Malaysia	University of Tenaga Malaysia
UPE	Unit Perancang Ekonomi	Economic Planning Unit
UPM	Universiti Putra Malaysia	University of Putra Malaysia
USM	Universiti Sains Malaysia	University of Science Malaysia
Y.B.	Yang Berhormat	The Honourable
PDRM	Polis Diraja Malaysia	Royal Malaysian Police
VOCS	Kandungan Organik Meruap	Volatile Organic Compounds
WQR	Wilayah Kualiti Air	Water Quality Region





PRAKATA FOREWORD

Jabatan Alam Sekitar dengan sukacitanya membentangkan Laporan Tahunan 2018 yang merangkumi pencapaian dan pelaksanaan program pada tahun tersebut.

Selari dengan visi Jabatan ini, "Pemuliharaan Alam Sekitar Untuk Kesejahteraan Rakyat" dan misi "Memastikan Pembangunan Lestari di Dalam Proses Memajukan Negara", JAS meneruskan mandat yang diberi untuk mentadbir Akta Kualiti Alam Sekeliling, 1974.

Penekanan yang berterusan diberikan dalam usaha mencegah dan mengawal pencemaran air, pencemaran udara dan pengurusan buangan terjadual. Pemeriksaan ke atas punca-punca pencemaran dan tindakan undang-undang telah diambil ke atas mereka yang melakukan kesalahan.

Penilaian Kesan Kepada Alam Sekeliling (EIA) masih menjadi strategi asas pencegahan yang dikuatkuasakan oleh Jabatan ini bagi mengurangkan kesan kepada alam sekeliling dari projek pembangunan. Sejumlah 343 laporan telah diterima dan diproses oleh Jabatan Alam Sekitar pada tahun 2018. Daripada bilangan ini, sebanyak 324 laporan bagi aktiviti yang tertakluk di bawah Jadual Pertama, Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling) 2015, dan 19 laporan bagi aktiviti yang tertakluk di bawah Jadual Kedua perintah tersebut.

Pada tahun 2018, pendekatan pematuhan sendiri (Self-Regulation) diteruskan sebagai pelengkap kepada *Command and Control* (CAC) bagi mencapai kecemerlangan alam sekitar. Kaedah pelaksanaan ini melibatkan pemeriksaan *desktop*. JAS juga meneruskan usaha dalam memastikan pematuhan sepenuhnya Akta Kualiti Alam Sekeliling, 1974 dan Peraturan-Peraturan di bawahnya oleh komuniti yang dikawal selia, mempromosi penggunaan teknologi kawalan yang cekap, amalan pengeluaran bersih serta amalan pengurusan terbaik.

The Department of Environment wishes to present the 2018 Annual Report which provides an accounts of its achievements and program implementations in that year.

In line with the department's vision "Environmental Conservation for the Well-being of the People" and mission "To Ensure Sustainable Development in the Process of Nation Building", DOE continues its mandate to administer the Environmental Quality Act (EQA), 1974.

Environmental Impact Assessment (EIA) continued to be the main preventive strategy enforced by the DOE to mitigate all environmental impacts from development projects.

Environmental Impact Assessment (EIA) continued to be the main preventive strategy enforced by the DOE to mitigate all environmental impacts from development projects. A total of 343 reports were received and processed by the Department of Environment in 2018. Of these, 324 reports of activities that specified in this First Schedule of Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, and 19 reports of activities that subjected to the Second Schedule of the order.

In 2018, the Self-Regulation approach will continue as a complement to Command and Control (CAC) to achieve environmental excellence. This implementation method involves desktop checking. The DOE also continued efforts to ensure full compliance with the Environmental Quality Act, 1974 and its Regulations by the regulated community, promoting efficient use of control technologies, clean production practices and best management practices.

JAS terus mempromosi program kesedaran dan pendidikan alam sekitar serta penyebaran maklumat kepada pelbagai peringkat masyarakat sebagai usaha berterusan dalam membangunkan masyarakat mesra alam di Negara ini.

Saya ingin mengambil kesempatan ini untuk merakamkan penghargaan kepada semua pihak yang telah memberikan sokongan dan komitmen mereka kepada Jabatan Alam Sekitar dalam melaksanakan tugas murni untuk alam sekitar yang sihat, selamat dan lestari serta meningkatkan kualiti kehidupan.

DOE continues to promote environmental education and awareness programs as well as disseminate information to various levels of the society towards building environmentally friendly society in the country.

I would like to take this opportunity to express my appreciation to everyone who has given their support and commitment to the Department of Environment in carrying out its duties for a sustainable, healthy, safely environment and enhanced quality of life.

“Alam Sekitar,
Tanggungjawab Bersama”
“Environment, Our
Shared Responsibility”

Norlin BT Jaafar

NORLIN BT JAAFAR

Ketua Pengarah Jabatan Alam Sekitar
Director-General, Department of Environment



VISI *VISION*

Pemuliharaan Alam Sekitar Untuk Kesejahteraan Rakyat

Environmental Conservation For The Well-being Of The People

MISI *MISION*

Memastikan Pembangunan Lestari Di dalam Proses Memajukan Negara
To ensure Sustainable Development In The Process Of Nation Building

STRATEGI *STRATEGIES*

- Integrasi Faktor Alam Sekitar Dalam Perancangan Pembangunan
- *Integration Of Environmental Factors In Development Planning*

- Pencegahan Dan Kawalan Pencemaran
- *Pollution Prevention And Control*

- Promosi Pendidikan Dan Kesedaran Alam Sekitar
- *Promotion Of Environmental Education And Awareness*

- Kerjasama Dan Hubungan Dua Hala, Serantau Dan Antarabangsa
- *Bilateral, Regional And International Cooperation*

- Penyertaan Awam Dalam Pengurusan Alam Sekitar
- *Public Participant In Environmental Management*

- Kerjasama Antara Agensi Dan Persekutuan Negeri
- *Inter-Agency And Federal State Cooperation*

- Pembangunan Lestari Melalui Pemuliharaan Sumber Semulajadi
- *Sustainable Development Throuhg Conservation Of Resources*

BAB 1

CHAPTER 1



MESYUARAT MAJLIS KUALITI ALAM SEKELILING (EQC) BAGI TAHUN 2018

Dalam tahun 2018, Majlis Kualiti Alam Sekeliling (EQC) telah bermesyuarat sebanyak satu (1) kali seperti berikut:

- i) Mesyuarat EQC Bilangan Ke 125 telah diadakan pada 29 Mac 2018.

Tempoh perlantikan ahli-ahli EQC bagi penggal ke 15 bermula pada 1 April 2015 dan tamat pada 31 Mac 2018. Pengerusi bagi EQC untuk penggal ke 15 adalah YBhg. Prof. Dato' Dr. Mazlin Mokhtar, Felo Utama, Institut Alam Sekitar Dan Pembangunan (LESTARI), Universiti Kebangsaan Malaysia. Senarai ahli-ahli EQC bagi penggal ke 15 adalah seperti di **Jadual 1**.

Mesyuarat telah membincangkan dan memperakukan beberapa cadangan yang dikemukakan untuk pertimbangan. Antara kertas kerja yang dibentangkan dalam tahun 2018 adalah seperti berikut:-

Perbincangan EQC ke 125

1. The Implementation of Sustainable Development Goals (SDGs) and New Urban Agenda (NUA) From Global Policy to Local Action - Urbanice Malaysia
2. Malaysian Sustainable Development Goals (SDGs) Dashboard - Jabatan Perangkaan Malaysia
3. Malaysia Ke Arah Pengurusan Sisa Pepejal Yang Mampan - Jabatan Pengurusan Sisa Pepejal Negara
4. Pematuhan Peraturan Udara Bersih - Jabatan Alam Sekitar
5. End of Life Vehicles - Jabatan Alam Sekitar
6. Co-Processing of Scheduled Waste - Jabatan Alam Sekitar

ENVIRONMENTAL QUALITY COUNCIL (EQC) MEETINGS FOR YEAR 2018

The Environmental Quality Council (EQC) had one (1) meeting in 2018 as follows:

- i) The 125th EQC meeting was held on 29 March 2018.

The appointment for EQC members for the 15th term was made for the period from 1st April 2015 till 31st March 2018. The Chairman appointed YBhg. Prof. Dato' Dr. Mazlin Mokhtar, Principal Fellow at the Institute for Environment and Development (LESTARI), The National University of Malaysia. The list of EQC Members for 15th term is as stated on **Table 1**.

The council had deliberated and endorsed matters presented at the meetings. Among the papers brought for their attention in year 2018 were as followed:-

125th EQC Discussion

1. The Implementation of Sustainable Development Goals (SDGs) and New Urban Agenda (NUA) From Global Policy to Local Action - Urbanice Malaysia
2. Malaysian Sustainable Development Goals (SDGs) Dashboard - Department of Statistics Malaysia
3. Malaysia Towards the Sustainable Solid Waste Management - National Solid Waste Management Department
4. Clean Air Regulations Compliance - Department of Environment
5. End of Life Vehicles - Department of Environment
6. Co-Processing of Scheduled Waste - Department of Environment

Jadual 1 : Senarai Ahli Majlis Kualiti Alam Sekeliling Penggal Ke-15 (1 April 2015 – 31 Mac 2018)
Table 1 : List Of Environmental Quality Council Members 15th Term (1 April 2015 – 31 March 2018)

BIL	PERWAKILAN DELEGATION	NAMA NAME
1	Pengerusi EQC EQC Chairman	YBhg. Prof. Dato' Dr. Mazlin Mokhtar
2	Wakil Menteri Kementerian Sumber Asli dan Alam Sekitar Representative for Minister, Ministry of Natural Resources and the Environment	YBhg. Dato' Sri Azizan Bin Ahmad
3	Wakil Menteri Kementerian Sains, Teknologi dan Inovasi Representative for Minister, Ministry of Science, Technology and Innovation	Dr. Zulkifli Mohamed Hashim
4	Wakil Menteri Kementerian Perdagangan Antarabangsa dan Industri Representative for Minister, Ministry of Trade & Industry	Tuan Haji Zakaria Jaafar
5	Wakil Menteri Kementerian Perdagangan Dalam Negeri Koperasi dan Kepenggunaan Representative for Minister, Ministry of Domestic Trade, Corporation & Consumerism	Cik Fatimah Nazaliza binti Mohd. Nasir
6	Wakil Menteri Kementerian Pertanian dan Industri Asas Tani Representative for Secretary-General, Ministry of Agriculture and Agro-Base Industries	YBhg. Datuk Ahmad bin Loman
7	Wakil Menteri Kementerian Sumber Manusia Representative for Minister, Ministry of Human Resources	Tuan Haji Saiful Azhar Mohd Said
8	Wakil Menteri Kementerian Pengangkutan Representative for Minister, Ministry of Transport	Encik Misrun Timin
9	Wakil Menteri Kementerian Perumahan dan Kerajaan Tempatan Representative for Minister, Ministry of Urban Wellbeing, Housing and Local Government	Encik Ismail Bin Mokhtar
10	Wakil Menteri Kementerian Tenaga, Teknologi Hijau dan Air Representative for Minister, Ministry of Energy, Green Technology and Water	Puan Rogayah binti Kadari
11	Wakil Menteri Kementerian Kesihatan Malaysia Representative for Minister, Ministry of Health	YBhg. Datuk Dr. Lokman Hakim bin Sulaiman
12	Wakil Kerajaan Negeri Sabah Representative from the Sabah Government	Datu Rosmadi Datu Sulai
13	Ahli Giliran Alternate Member	Tuan Haji Mohd. Yusrie Abdullah



Jadual 1 : Senarai Ahli Majlis Kualiti Alam Sekeliling Penggal Ke-15 (1 April 2015 – 31 Mac 2018)
Table 1 : List Of Environmental Quality Council Members 15th Term (1 April 2015 – 31 March 2018)

BIL	PERWAKILAN DELEGATION	NAMA NAME
14	Wakil Kerajaan Negeri Sarawak Representative from the Sarawak Government	YBhg. Datu Sudarsono Osman
15	Ahli Giliran Alternate Member	Encik Peter Sawal
16	Wakil Industri Petroleum Representative from the Petroleum Industry	Mohamed Amin B Abdullah
17	Ahli Giliran Alternate Member	Cik Lee Tzee Wan
18	Wakil Industri Kelapa Sawit Representative from the Oil Palm Industry	YBhg. Prof. Emeritus Dato' Dr. Makhdzir Mardan
19	Ahli Giliran Alternate Member	Dr. Ruslan Abdullah
20	Wakil Persekutuan Pekilang-Pekilang Malaysia (FMM) Representative from the Federation of Malaysian Manufacturers	YBhg. Dato' Hj. Mizanur Rahman Ghani
21	Ahli Giliran Alternate Member	Encik K.N. Gobinathan
22	Wakil Industri Getah Representative from the Rubber Industry	Encik Lim Sum Teck
23	Ahli Giliran Alternate Member	Encik Chin Hon Meng
24	Wakil Kakitangan Akademik Representative from the Academic Staff of the Universities or Colleges in Malaysia	Dr. Subramaniam Karuppannan
25	Ahli Giliran Alternate Member	-
26	Wakil Pertubuhan Yang Berpengalaman Mengenai Alam Sekitar Representative from the registered Societies knowledgeable and having interests in matters pertaining to the environment	Encik Gobinathan Kumaran Nair
27	Ahli Giliran Alternate Member	Puan Geetha P.Kumaran
28	Wakil Pertubuhan Yang Berpengalaman Mengenai Alam Sekitar Representative from the registered Societies knowledgeable and having interests in matters pertaining to the environment	YBhg. Dato' Dr. Dionysius S.K Sharma
29	Ahli Giliran Alternate Member	Dr Sundari Ramakrishna

BAB 2

CHAPTER 2



PENGURUSAN SUMBER MANUSIA DAN KEWANGAN

Seksyen Pentadbiran dan Inovasi

Fungsi Seksyen ini adalah memberi khidmat sokongan melalui peralatan dan sistem Pentadbiran Am Jabatan. Antara aktiviti yang telah dianjurkan pada tahun 2018 adalah:

HUMAN RESOURCES AND FINANCIAL MANAGEMENT

Innovation and Administration Section

Function This section is to provide support through the Department's General Administration equipment and systems. Among the activities organized in 2018 are:



Bengkel Penyediaan Dokumen myPortfolio: Panduan Kerja Sektor Awam pada 8-9 November 2018 di Ibu Pejabat Jabatan Alam Sekitar Malaysia.
Myportfolio Document Preparation Workshop: Public Sector Work Guide on November 8-9 November 2018 at the Department of Environment Malaysia.



Kursus Kecemerlangan & Pengukuhan Jati Diri Jabatan Alam Sekitar pada 26-28 April 2018 di Tapak RAMSAR, Tasik Bera, Pahang.
Excellence & Reinforcement Course of the Department of Environment on 26-28 April 2018 at RAMSAR Site, Lake Bera, Pahang.



Kursus Pegawai Rekod Jabatan (PRJ) dan pembantu Tadbir Rekod Jabatan (PTRJ) pada 21-23 Mac 2018 di Institut Aminuddin Baki, Pahang.
Department of Records Officer (PRJ) and Department of Records Administrative Assistant (PTRJ) on 21-23 March 2018 at Aminuddin Baki Institute, Pahang.



Seksyen Sumber Manusia

Human Resource Section



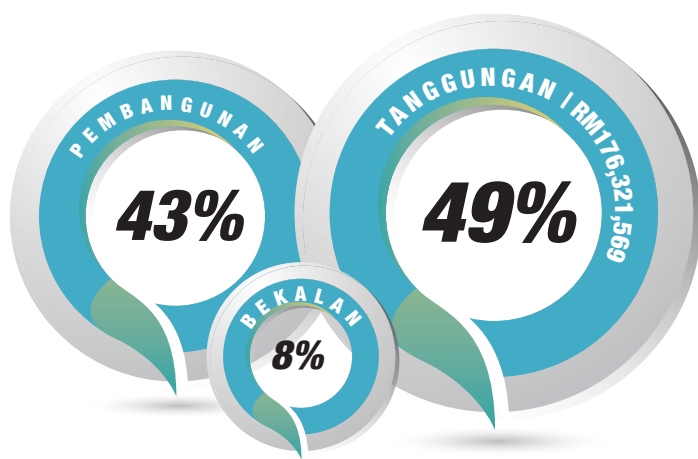
Seksyen Kewangan

Perbelanjaan yang telah diluluskan bagi tahun 2018 berjumlah **RM176,321,569**. Perbelanjaan Mengurus diperuntukkan sebanyak **RM100,952,169** yang terdiri daripada perbelanjaan Bekalan sebanyak **RM86,475,000 (49%)** dan perbelanjaan Tanggungan sebanyak **RM14,477,169 (8%)**. Bagi Perbelanjaan Pembangunan disediakan peruntukan sebanyak **RM75,369,400 (43%)**. Anggaran Perbelanjaan JAS tahun 2018 adalah seperti rajah di bawah.

Financial Section

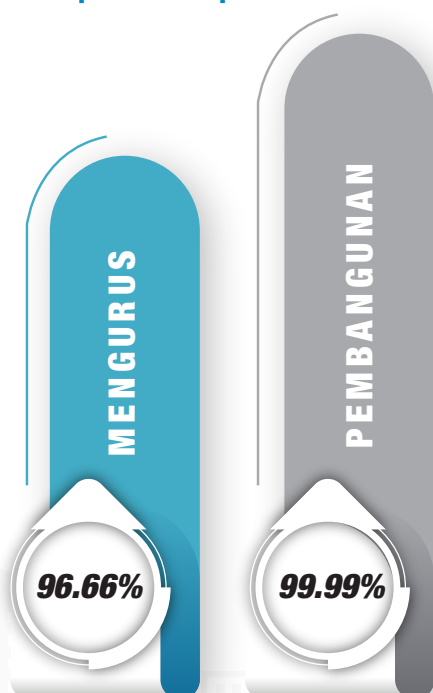
Expenses for the year 2018 amounted to **RM176,321,569**. Operating Expenditure is allocated at **RM100,952,169** which comprises of **RM86,475,000 (49%)** of Supply expense and Expenditure of **RM14,477,169 (8%)**. For Development Expenditures provided an allocation of **RM75,369,400 (43%)**. The Expenditure Budget for the year 2018 is as shown in figure below.

Anggaran Perbelanjaan Tahun 2018 Jabatan Alam Sekitar
Budget expenditure of 2018 Environment Department



Rajah 2.1 : Carta menunjukkan agihan penggunaan peruntukan bagi perbelanjaan pembangunan, tanggungan dan bekalan
Figure 2.1 : The chart shows the allocation of allowances for development expenditure, liabilities and supplies.

Prestasi Perbelanjaan Tahun 2018 Jabatan Alam Sekitar
The expenditure performance of the 2018 Environment Department



Rajah 2.2 : Graf menunjukkan Prestasi perbelanjaan Mengurus dan Pembangunan bagi tahun 2018 masing-masing pada tahap 99.66% dan 99.99%
Figure 2.2 : The graph shows Performance Management and Development expenditure for the year 2018 at 99.66% and 99.99% respectively.

Pencapaian Kewangan JAS 2018

JAS telah memperolehi pencapaian cemerlang bagi pengauditan di bawah:

- Sijil Audit Bersih - Pengauditan Kumpulan Wang Amanah JAS; dan
- PTJ (JAS Ibu Pejabat) Prestasi Bil Cemerlang - Mesyuarat Penyelarasan Bahagian Akaun bersama PTJ MESTECC.

Kursus Kewangan JAS 2018

Seksyen Kewangan telah menganjurkan Kursus Pemantapan Sistem ePerolehan bagi Modul Kontrak Kementerian pada 16 Julai 2018. Seramai 20 orang peserta daripada JAS Ibu Pejabat, JAS WPKL dan EiMAS telah hadir ke kursus berkenaan.

Seksyen Pengurusan Aset

Sehingga tahun 2018 bilangan aset yang terkumpul adalah sebanyak 24,733 dengan nilai perolehan sebanyak RM 66.4 Juta .

Financial Performance of DOE 2018

The DOE has earned excellent results for the audit below:

- Net Audit Certificate - Trust Fund Trust Fund; and
- PTJ (JAS Headquarters) Excellent Bil Performance - Coordination Meeting with MESTECC PTJ Account.

Financial Training Course of the 2018

The Finance Section has organized the ePerolehan System Enhancement Course for the Ministry's Contract Module on 16 July 2018. A total of 20 participants from the Headquarters of the Headquarters, WPKL and EiMAS JAS have attended the course.

Asset Management Section

As of 2018, the accumulated assets amounted to 24,733 with a turnover of RM 66.4 Million.

Jadual 2.1 : Jadual Menunjukkan Kedudukan Semasa Aset Alih Jabatan Alam Sekitar Malaysia Tahun 2018

Table 2.1 : The Table Shows the Present Position of the Assets Department of the Department of Environment Malaysia Year 2018

JABATAN	BILANGAN KEW. PA-2	JUMLAH NILAI HARTA MODAL (RM)	BILANGAN KEW. PA-3	JUMLAH NILAI ASET ALIH BERNILAI RENDAH (RM)	BIL KEW. PA 2 & BIBL. KEW. PA 3	JUMLAH NILAI HARTA MODAL + ASET ALIH BERNILAI RENDAH (RM)
JABATAN ALAM SEKITAR	6,942	58,854,741.38	1,7791	7,569,009.35	24,733	66,423,750.73

Daripada jumlah aset yang sedia ada di Jabatan Alam Sekitar kebanyakannya adalah aset untuk menjalankan

Of the total assets available in the Department of Environment, most of them are assets to carry out enforcement activities such as Water



aktiviti penguatkuasaan seperti Alat Pengawasan Air (Multiprobe YSI Pro DSS, Calorimeter, Water Depth Sampler), Alat Pengawasan Udara (PM¹⁰ E-Sampler, PM¹⁰ E-BAM, PM¹⁰ GRIMM), Alat Operasi Kenderaan Bermotor (Technomotor, Sound Level Meter, Ten Innova (CoHC)) dan Alat Siasatan Aduan (Multigas Analyser (Gasmate), Multigas Detector, GPS).

Monitoring Equipment (Multiplex YSI Pro DSS, Calorimeter, Water Depth Sampler), Air Monitoring Equipment (PM¹⁰ E-Sampler, PM¹⁰ E-BAM, PM¹⁰ GRIMM), Motor Innovation (Technomotor, Sound Level Meter, Ten Innova (CoHC)) and Complaint Investigation Tool (Multigas Analyzer (Gasmate), Multigas Detector, GPS).

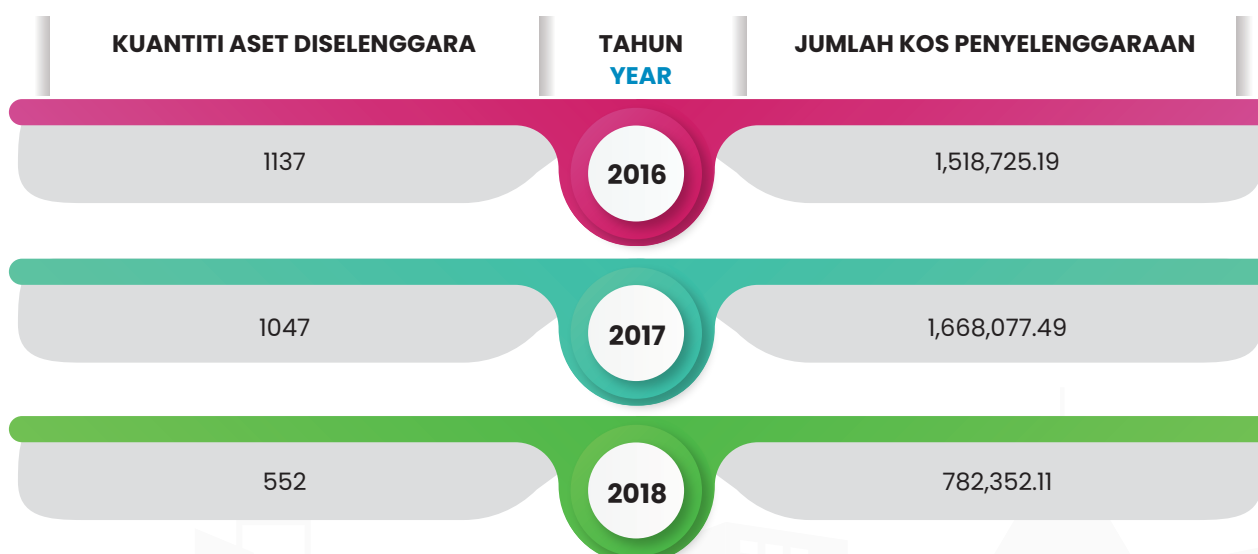
Jadual 2.2 : Jadual Menunjukkan Kuantiti dan Nilai Perolehan (RM) Alat-Alat Penguatkuasaan di JAS Sehingga Tahun 2018

Table 2.2 : The Table Shows the Present Position of the Assets Department of the Department of Environment Malaysia Year 2018

JENIS ASET	KUANTITI	NILAI PEROLEHAN ASET (RM)
Alat Pengawasan Udara. Aduan, Kenderaan Bermotor	234	6,391,805.56
Alat Pengawasan Air	94	2,849,120.00

Setiap tahun JAS memerlukan peruntukan bagi penyelenggaraan aset alih termasuk kenderaan dan alat-alat penguatkuasaan. Penyelenggaraan aset alih adalah penting bagi memastikan aktiviti-aktiviti penguatkuasaan berjalan dengan lancar dan mencapai KPI yang telah ditetapkan. Berikut merupakan kos penyelenggaraan bagi tahun 2016, 2017 dan 2018 di JAS.

Every year the DOE needs provisions for the maintenance of movable assets including vehicles and enforcement tools. Maintenance of movable assets is important to ensure that enforcement activities run smoothly and achieve a predetermined KPI. The following is a maintenance cost for 2016, 2017 and 2018 at the DOE.



Rajah 2.3 : Jadual menunjukkan kos penyelenggaraan aset bagi tahun 2016, 2017 dan 2018
Figure 2.3 : The table shows the cost of asset maintenance for 2016, 2017 and 2018

BAB 3

CHAPTER 3



PENILAIAN KESAN KEPADA ALAM SEKELILING DAN INPUT KEPADA PERANCANGAN PEMBANGUNAN

Penilaian Kesan Kepada Alam Sekeliling (EIA) merupakan satu alat perancangan untuk mengelak dan mengurangkan kesan-kesan kepada alam sekitar akibat aktiviti pembangunan. Ianya juga boleh membantu untuk mengelakkan kos perbelanjaan yang tidak sepatutnya bagi membaiki kerosakan alam sekitar akibat daripada elemen penting yang terabai semasa dalam peringkat perancangan.

EIA adalah kajian untuk mengenal pasti, meramal, menilai dan memberi maklumat mengenai kesan-kesan kepada alam sekeliling bagi sesuatu cadangan projek dan mengemukakan langkah-langkah tebatan sebelum projek berkenaan dilulus dan dilaksanakan.

Laporan EIA 2018

Sejumlah 343 laporan EIA telah diterima dan diproses oleh Jabatan Alam Sekitar pada tahun 2018 (**Rajah 3.1**). Ia terdiri daripada 324 (94%) laporan bagi aktiviti yang tertakluk di bawah Jadual Pertama, Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling) 2015, dan 19 (6%) laporan bagi aktiviti yang tertakluk di bawah Jadual Kedua perintah tersebut.

Negeri Pahang menerima bilangan laporan EIA tertinggi pada tahun 2018 iaitu sebanyak 60 (17.5%) laporan diikuti dengan Selangor sebanyak 52 (15.2%) laporan, dan Kelantan sebanyak 50 (14.6%) laporan (**Rajah 3.2**). Tiada laporan EIA berkaitan pembangunan projek baharu di Zon Ekonomi Eksklusif (ZEE).

ENVIRONMENTAL IMPACT ASSESSMENT AND INPUT FOR DEVELOPMENT

Environmental Impact Assessment (EIA) is essentially a planning tool for preventing, avoiding and reducing the environmental impacts due to development activities. It can also helps to avoid unnecessary costs in rehabilitating a damaged environment due to unheeded significant elements during planning stage.

EIA is a study to identify, predict, evaluate and communicate information about the impacts on the environment of a proposed project and to detail out the mitigating measures prior to project approval and implementation.

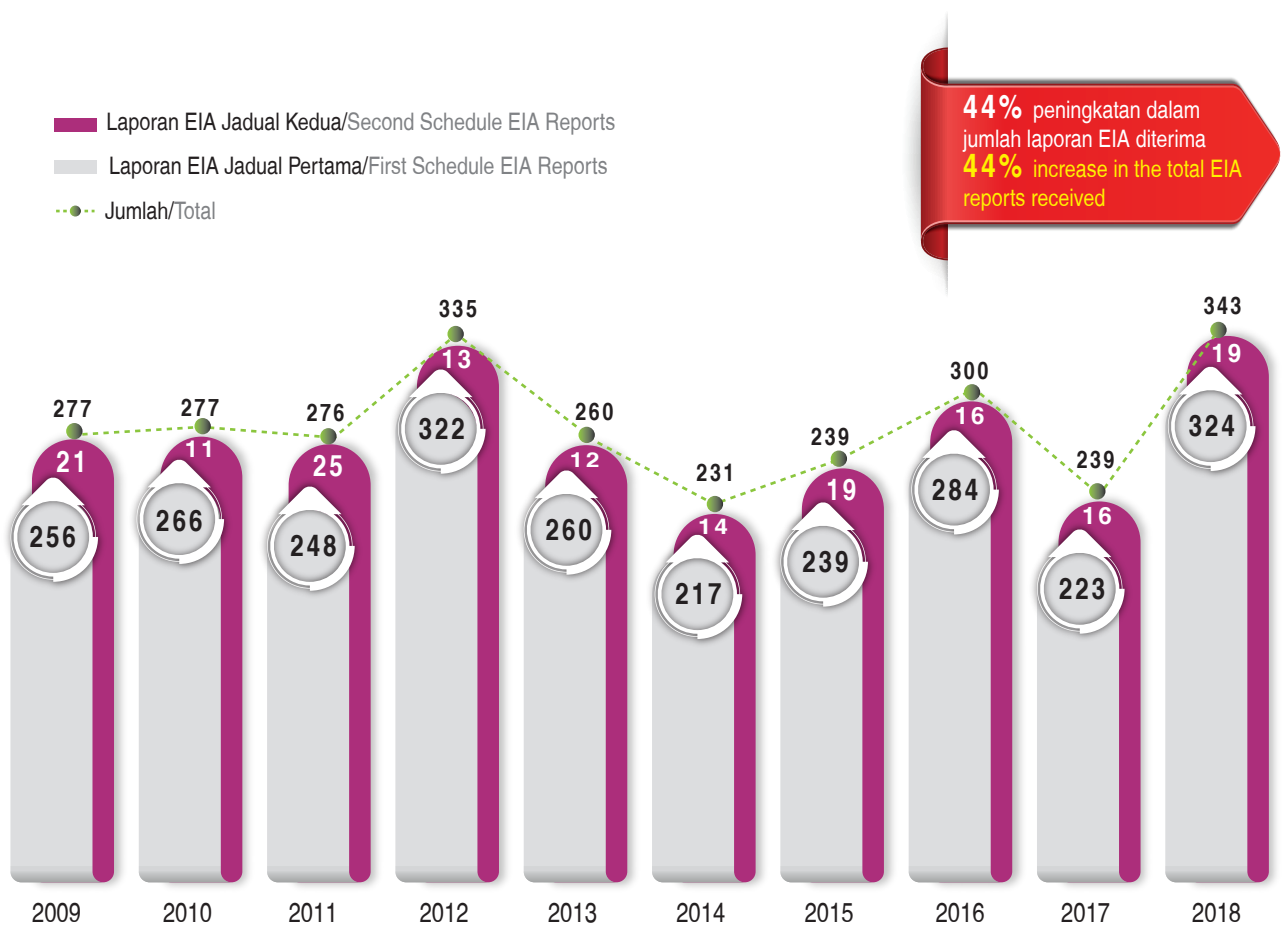
EIA Reports 2018

A total of 343 EIA reports were received and processed by the Department of Environment in 2018 (**Figure 3.1**). They consist of 324 (94%) reports of activities that specified in the First Schedule of Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, and 19 (6%) reports of activities that subjected to the Second Schedule of the order.

The state of Pahang received the highest number of EIA reports in 2018, with 60 (17.5%) reports, Selangor with 52 (15.2%) laporan, and Kelantan with 50 (14.6%) (**Figure 3.2**). There have been no EIA reports received regarding to the new project in the territory of Exclusive Economic Zone (EEZ).

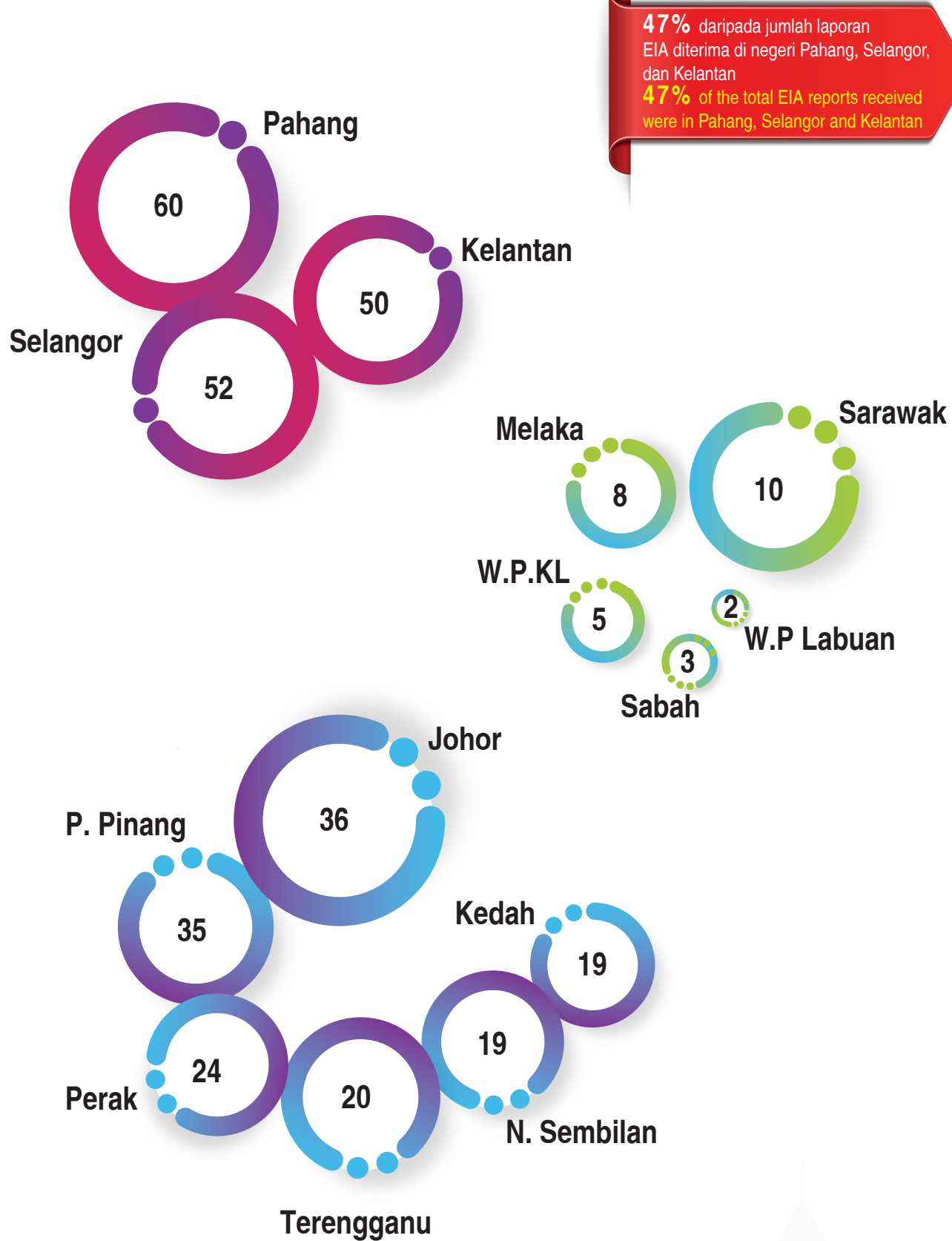
Laporan EIA bagi aktiviti berkaitan perhutanan merupakan yang paling banyak diterima pada tahun 2018 iaitu sebanyak 77 (22.4%) laporan, diikuti dengan pengolahan dan pelupusan buangan sebanyak 58 (16.9%) laporan, serta pertanian dan pembangunan di kawasan cerun masing-masing sebanyak 28 (8.2%) laporan (**Rajah 3.3**).

The EIA reports for activities related to forestry was the mostly received in the year 2018 with 77 (22.4%) reports, followed by waste treatment and disposal with 58 (16.9%), and agriculture as well as development in slope area with 28 (8.2%) respectively (**Figure 3.3**).

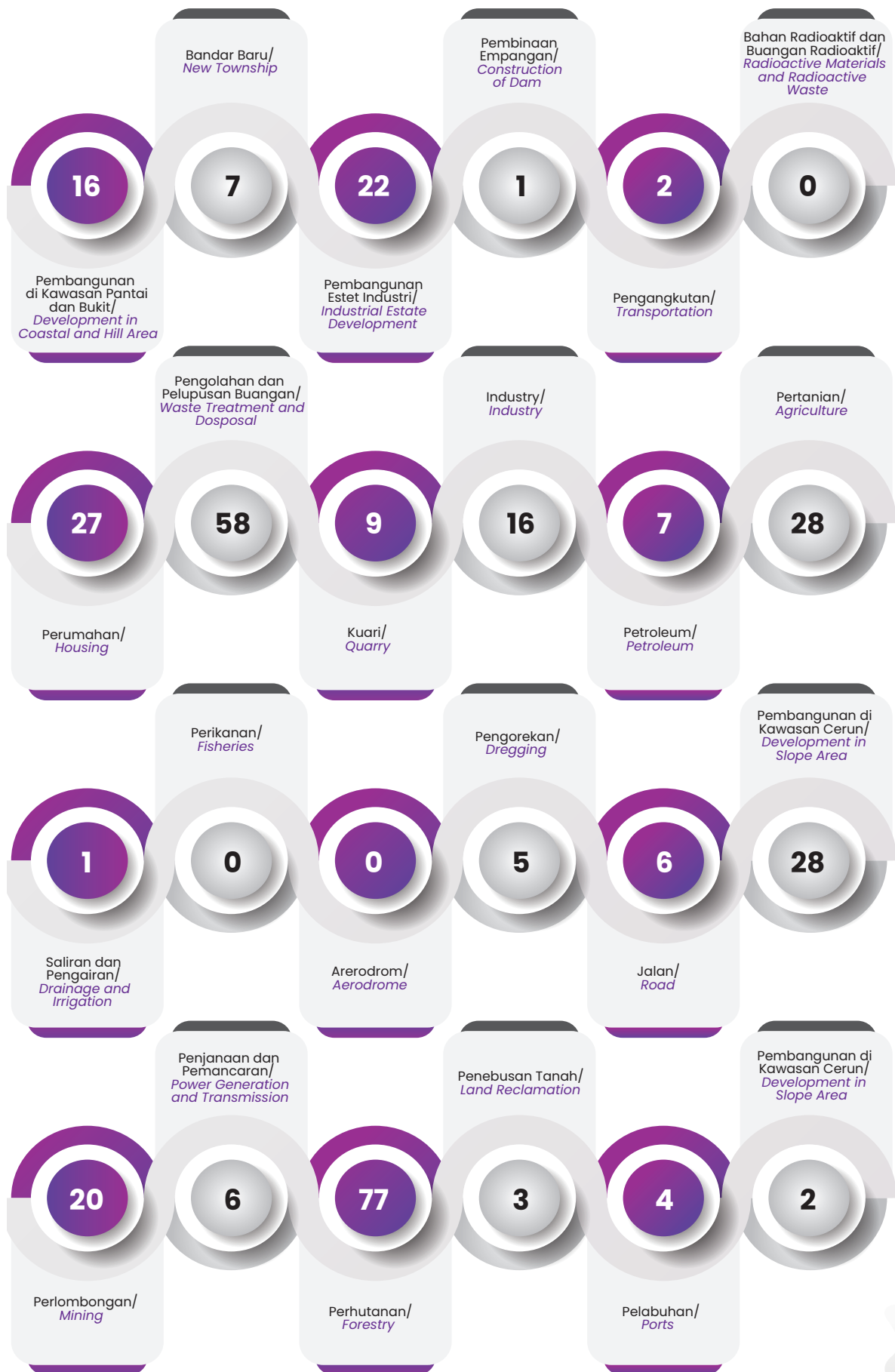


Rajah 3.1 : Bilangan laporan EIA yang diterima mengikut tahun
Figure 3.1 : Number of EIA reports received by years





Rajah 3.2 : Bilangan laporan EIA yang diterima mengikut negeri 2018
 Figure 3.2 : Number of EIA reports received by state 2018



Rajah 3.3 : Bilangan laporan EIA yang diterima mengikut Aktiviti 2018
Figure 3.3 : Number of EIA reports received by Activity 2018

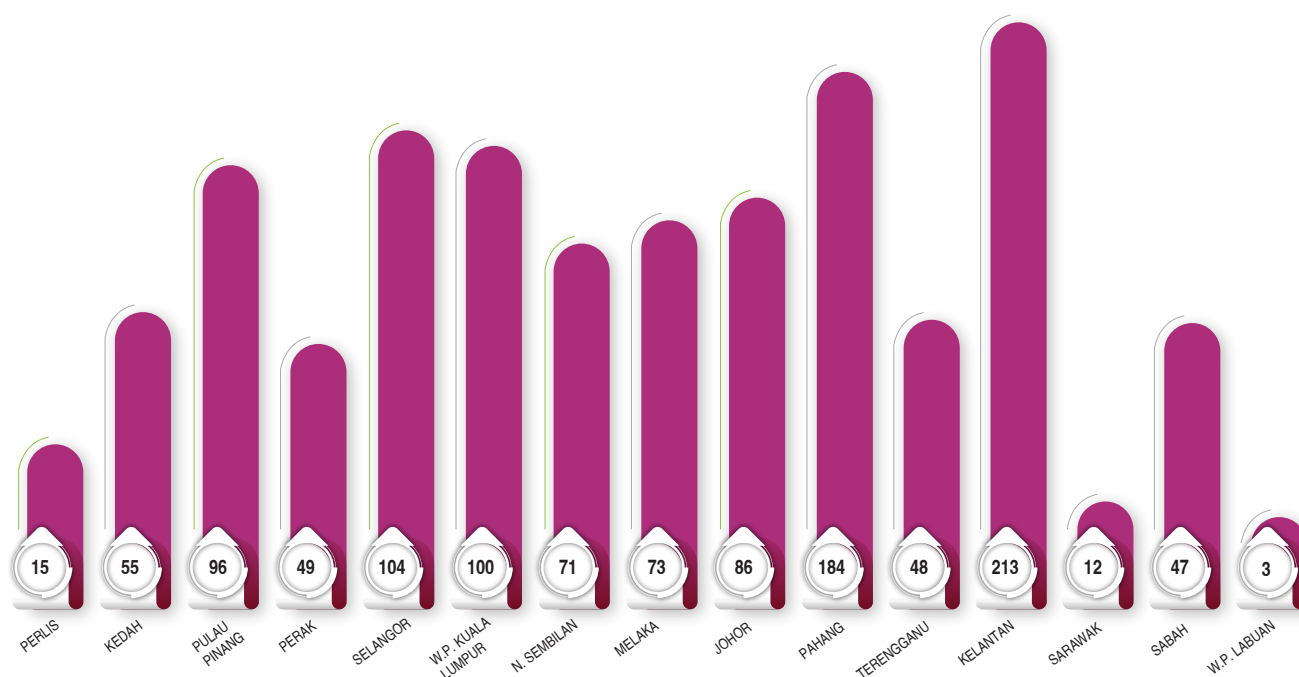


Siasatan Penguatkuasaan Projek EIA

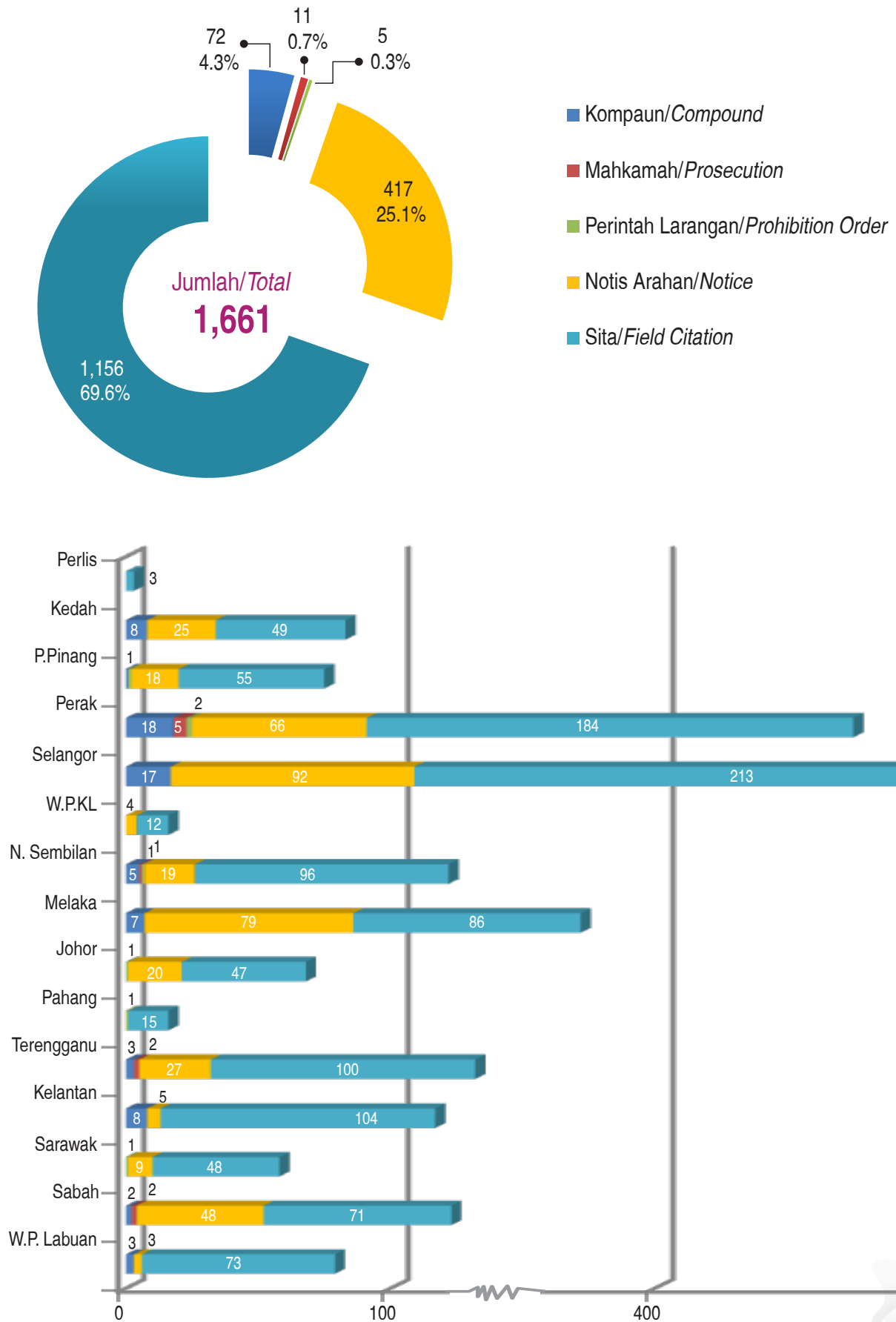
Sejumlah 1,156 siasatan penguatkuasaan telah dijalankan pada tahun 2018 untuk mengenalpasti status pembangunan dan pematuhan projek-projek EIA (**Rajah 3.4**). Daripada siasatan tersebut, sejumlah 417 notis arahan, 72 kompaun telah dikeluarkan manakala 11 kes telah didakwa di mahkamah kerana tidak mematuhi syarat-syarat kelulusan EIA. Dalam pada itu, sebanyak 5 perintah larangan di bawah Seksyen 34AA juga telah dikeluarkan (**Rajah 3.5**).

EIA Enforcement Investigations

A total of 1,156 enforcement inspections on EIA projects were conducted in 2018 to check the project development status and the compliance of EIA approval conditions (**Figure 3.4**). From the inspections, a total of 417 notices, 72 compounds were issued, and 11 cases were charged in court for not complying with the terms of the EIA approval. In the meantime, 5 prohibition orders under Section 34AA also been issued (**Figure 3.5**).



Rajah 3.4 : Siasatan Penguatkuasaan Projek EIA, 2018
Figure 3.4 : Post EIA Enforcement Investigation 2018



Rajah 3.5 : Tindakan Susulan Penguatkuasaan Post EIA Tahun 2018
 Figure 3.5 : Follow Up Action Of EIA Enforcement Investigations 2018



Skim Pendaftaran Jururunding EIA

Skim Pendaftaran Jururunding EIA yang baru telah mula diperkenalkan pada 1 Jun 2007. Pendaftaran Jururunding EIA ini telah menjadi satu keperluan undang-undang di bawah Akta Kualiti Alam Sekeliling, 1974 (Pindaan 2012) yang mewajibkan semua jururunding EIA untuk berdaftar dengan JAS sebelum menjalankan kajian EIA.

Pendaftaran adalah terbuka kepada individu dan dibahagikan kepada tiga kategori iaitu Jururunding EIA, Jururunding Subjek dan Pembantu Jururunding.

Pemohon boleh mengemukakan permohonan untuk didaftarkan di bawah kategori yang bersesuaian dengan kelayakan akademik, kepakaran dan pengalaman mereka. Sebanyak 79 permohonan telah diterima pada tahun 2018 di mana hanya 57 layak untuk didaftarkan.

Sehingga 31 Disember 2018, sebanyak 1,296 individu telah berdaftar di bawah Skim Pendaftaran Jururunding EIA, dimana 391 orang adalah Jururunding EIA, 352 orang Jururunding Subjek dan 553 orang adalah Penolong Jururunding (**Jadual 3.1**).

Tempoh sah pendaftaran bagi Jururunding EIA adalah selama tiga (3) tahun. Pendaftaran hendaklah diperbaharui setelah tamat tempoh.

Pemohon yang ingin berdaftar di bawah Skim Pendaftaran Jururunding EIA perlu merujuk kepada keperluan yang telah digariskan dalam *EIA Consultant Registration Scheme Guidance Document*.

EIA Consultants Registration Scheme

The new EIA Consultants Registration Scheme was introduced in June 1, 2007. This registration of EIA Consultants has become a legal requirement under the Environmental Quality Act, 1974 (Amendment 2012) which requires all EIA consultants to be registered with DOE prior to carrying out any EIA studies.

Registration is open for individuals and divided into three categories namely, EIA Consultant, Subject Consultant and Assistant Consultant.

Applicants may apply for registration under any category appropriate to their academic qualification, expertise and experience. A total of 79 applications were received in 2018 where only 57 were qualified to be registered.

As of 31 December 2018, DOE has registered 1,296 individuals under the EIA Consultant Registration Scheme where 391 are EIA Consultants, 352 are Subject Consultants and 553 are Assistant Consultants (**Table 3.1**).

Validity period for registration of EIA Consultants is three (3) years. Renewal is required at the end of the validity period to remain active.

Applicants who wish to be registered under the EIA Consultant Registration Scheme should refer to EIA Consultant Registration Scheme Guidance Document.

Jadual 3.1 : Jumlah Keseluruhan Jururunding Berdaftar Sehingga 31 Disember 2018
Table 3.1 : Number of Registered Consultants Until 31 December 2018

KATEGORI CATEGORY	JUMLAH DILULUSKAN NO. OF APPROVED APPLICATION	PERATUSAN (%) PERCENTAGE (%)
Jururunding EIA EIA Consultant	391	30
Jururunding Subjek Subject Consultant	352	27
Penolong Jururunding Assistant Consultant	553	43
Jumlah Total	1,296	100

Skim Pendaftaran Juruaudit Alam Sekitar

Skim Pendaftaran Juruaudit Alam Sekitar telah mula diperkenalkan pada Jun 2009. Mulai 1 Disember 2009, Jabatan Alam Sekitar hanya menerima laporan-laporan audit pematuhan yang disediakan oleh Juruaudit Alam Sekitar yang berdaftar dengan JAS sahaja.

Bagi tahun 2018, sebanyak lima belas (15) permohonan baharu telah diterima dan sebelas (11) daripadanya telah didaftarkan sebagai Juruaudit Alam Sekitar manakala bagi permohonan pembaharuan, pihak jabatan telah menerima dua puluh satu (21) permohonan dan 11 permohonan telah diluluskan (**Rajah 3.6**). Sehingga 31 Disember 2018, sebanyak sembilan puluh tujuh (97) orang individu telah didaftarkan sebagai Juruaudit Alam Sekitar.

Tujuan utama skim pendaftaran ini adalah untuk memastikan hanya individu yang kompeten sahaja dibenarkan menjalankan audit alam sekitar.

Audit Alam Sekitar yang dilaksanakan merupakan Audit Pihak Ketiga (Audit Bebas) bagi pematuhan terhadap keperluan alam sekitar di bawah Seksyen 33A, Akta Kualiti Alam Sekeliling 1974.

Environmental Audit Registration Scheme

The Environmental Audit Registration Scheme was introduced on the 1st of June 2009. Starting from the 1st of December 2009, the Department of Environment only accept environmental audit report prepared and submitted by Registered Environmental Auditor only.

For 2018, a total of fifteen (15) new applications were processed and eleven (11) auditors have been successfully registered as Environmental Auditor while for the renewal application, the department received twenty one (21) applications and eleven (11) applications have been approved (**Figure 3.6**). As of 31st December 2018, a total of ninety seven (97) auditors have been registered under the Scheme.

The main objective of the scheme is to ensure that only competent individuals are allowed to conduct this third-party environmental audit.

Environmental Audit conducted is a Third-Party Audit (Independent Audit) for compliance with the environmental requirements under Section 33A of the Environmental Quality Act 1974.

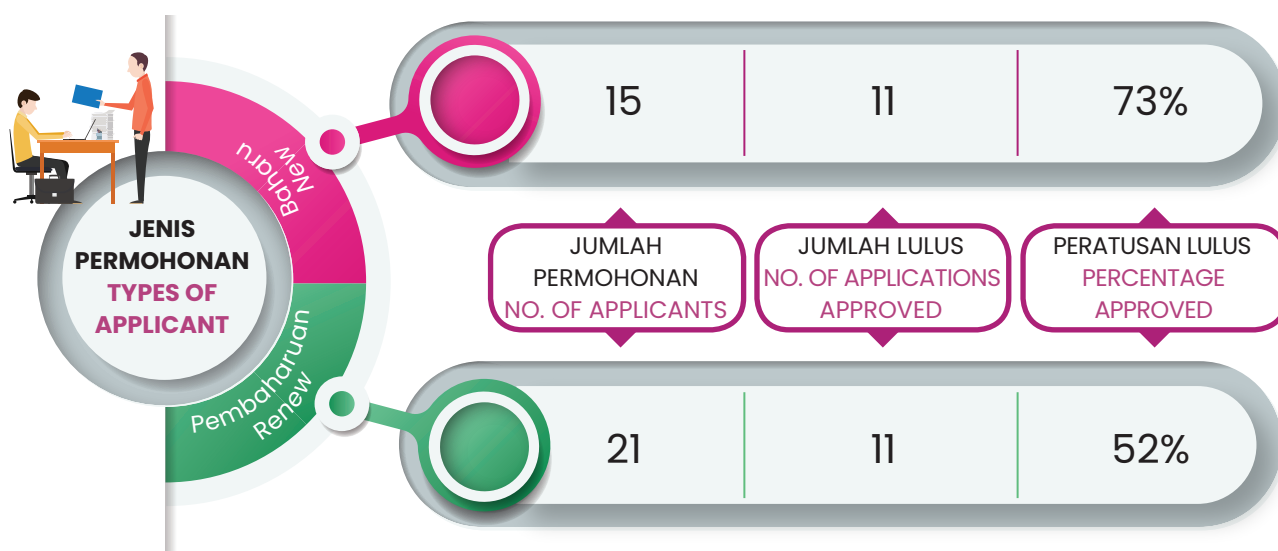


Skim ini memastikan pelaksanaan audit dan pelaporan audit alam sekitar adalah mengikut prosedur dan garis panduan yang ditetapkan.

Pelaksanaan audit ini dapat mengurangkan kebergantungan terhadap aktiviti penguatkuasaan oleh JAS dan menggalakkan industri dan pemaju projek untuk meningkatkan tahap pematuhan alam sekitar secara langsung serta tidak langsung.

This scheme ensures the environmental audit and environmental audit reporting is in accordance with established procedures and guidelines.

The implementation of these audits reduces the dependence on enforcement activities by the DOE and encourages industry and project developers to improve the level of environmental compliance directly and indirectly.



Rajah 3.6 : Jumlah permohonan juruaudit alam sekitar yang diluluskan bagi tahun 2018
Figure 3.6 : Number of approved environmental auditor applications in 2018

Kursus Induksi Untuk Juruaudit Alam Sekitar

Bermula dari tahun 2010, semua juruaudit alam sekitar yang berdaftar dikehendaki menghadiri Kursus Induksi yang wajib bagi Environmental Audit dan lulus penilaian yang berkaitan sebagai syarat untuk memperbaharui pendaftaran mereka.

Pada tahun 2018, kursus induksi untuk Juruaudit Alam Sekitar telah diadakan pada 27 Februari hingga 3 Mac 2018 di Hotel Puri Pujangga, UKM, Bangi, Selangor.

Induction Course for Environmental Auditor

Starting from 2010, all registered environmental auditors are required to attend the Compulsory Induction Course for the Environmental Auditor and pass the relevant assessments as a condition for renewing their registration.

In 2018, the induction course for Environmental Auditors was held on 27th February to 3rd March, 2018 at Hotel Puri Pujangga, UKM, Bangi, Selangor.

Tujuan kursus ini adalah untuk memberikan penerangan terperinci kepada semua Juruaudit Alam Sekitar tentang keperluan-keperluan pentadbiran dan teknikal semasa menjalankan audit alam sekitar; meningkatkan pemahaman terhadap undang-undang dan peraturan Akta Kualiti Alam Sekeliling, 1974 dan konvensyen yang berkaitan, serta memberi panduan untuk pelaporan audit alam sekitar mengikut format yang ditetapkan oleh Jabatan Alam Sekitar.

Pembangunan Profesional Berterusan (CPD)

Keperluan bagi Pembangunan Profesional Berterusan telah diwajibkan dibawah Skim Pendaftaran Juruaudit Alam Sekitar, dimana juruaudit berdaftar perlu mengumpul jumlah jam latihan yang tertentu bagi membolehkan mereka memperbaharui pendaftaran.

Mana-mana penyedia latihan boleh memohon kepada kepada pihak Institut Alam Sekitar Malaysia (EiMAS) bagi mendapatkan bilangan jam kredit. Maklumat berkenaan program-program ini kemudiannya disebarikan kepada semua juruaudit berdaftar.

Input Alam Sekitar Kepada Perancangan Pembangunan

Pada tahun 2018, 10,200 input alam sekitar telah diberikan oleh Pejabat JAS Negeri kepada penggerak projek, Kerajaan Negeri, Pihak Berkuasa Tempatan, Pejabat Tanah serta serta agensi-agensi lain yang berkaitan.

Input teknikal yang diberikan ini adalah penting bagi memastikan keperluan perundangan alam sekitar dipatuhi dan aspek alam sekitar diberikan pertimbangan yang sewajarnya di dalam proses membuat keputusan.

The objectives of the course are to guide the Registered Environmental Auditor to undertake environmental audit in a manner that meets Department of Environment (DOE) requirements and audit procedures; to give better understanding on DOE legal requirements (Environmental Quality Act, 1974) as well as other related conventions and also to guide the environmental auditor to prepare Environmental Audit reports in a format specified by the Department of Environment (DOE).

Continuous Professional Development (CPD)

The requirement for Continuous Professional Development has been included under the Environmental Auditor Registration Scheme whereby the registered auditors are required to obtain a certain number of training (CPD) hours to enable them to renew their registration.

Course organizer or course provider may apply to Institute of Environment Malaysia (EiMAS) to obtain CPD Hours for their programmes. The information about the programmes were disseminated to all registered auditors.

Environmental Input For Development Planning

In 2018, 10,200 environmental inputs were provided by DOE state office to the project developers, State Governments, Local Authorities and Land Offices, as well as other relevant agencies.

Technical environmental inputs provided were important to ensure that the legal requirements of the environment are complied with and environmental aspects were given due consideration in the decision-making process.



Di Ibu Pejabat JAS, input alam sekitar turut diberikan kepada agensi seperti Kementerian Perumahan dan Kerajaan Tempatan (KPKT), Malaysian Investment Development Authority (MIDA), Kementerian Perdagangan Dalam Negeri dan Hal-Ehwal Pengguna (KPDNHEP) dan Kementerian, Air, Tanah dan Sumber Asli (KATS) mengenai penyelarasan perancangan pembangunan, pelaburan industri dari dalam dan luar negara, pelan tempatan, kajian rancangan fizikal negara, kajian kawasan sensitif alam sekitar, pembukaan medan minyak, aktiviti di kawasan tanah tinggi dan sebagainya.

Pemberitahuan Dan Kelulusan Bertulis

Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan), 2009 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian), 2009 menghendaki supaya pihak premis mengemukakan pemberitahuan bertulis kepada Ketua Pengarah Alam Sekitar sebelum pembinaan sistem pengolahan kumbahan/ efluen perindustrian.

Manakala Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014 menghendaki supaya Kelulusan Bertulis diperolehi terlebih dahulu daripada Ketua Pengarah Alam Sekitar sebelum pemasangan alat pembakaran bahan api dan cerobong.

Pada tahun 2018, JAS telah menerima sebanyak 212 pemberitahuan bertulis bagi pembinaan loji rawatan sisa kumbahan, 382 pemberitahuan bertulis untuk sumber baharu atau diubah bagi pelepasan efluen perindustrian atau efluen bercampur, dan 2,400 permohonan bagi pemasangan alat kawalan pencemaran udara. Tambahan itu, JAS juga telah memproses sebanyak 3,574 permohonan bagi kelulusan bertulis untuk pemasangan alat pembakaran bahan api seperti dandang dan alat janakuasa (**Rajah 3.7 dan Rajah 3.8**).

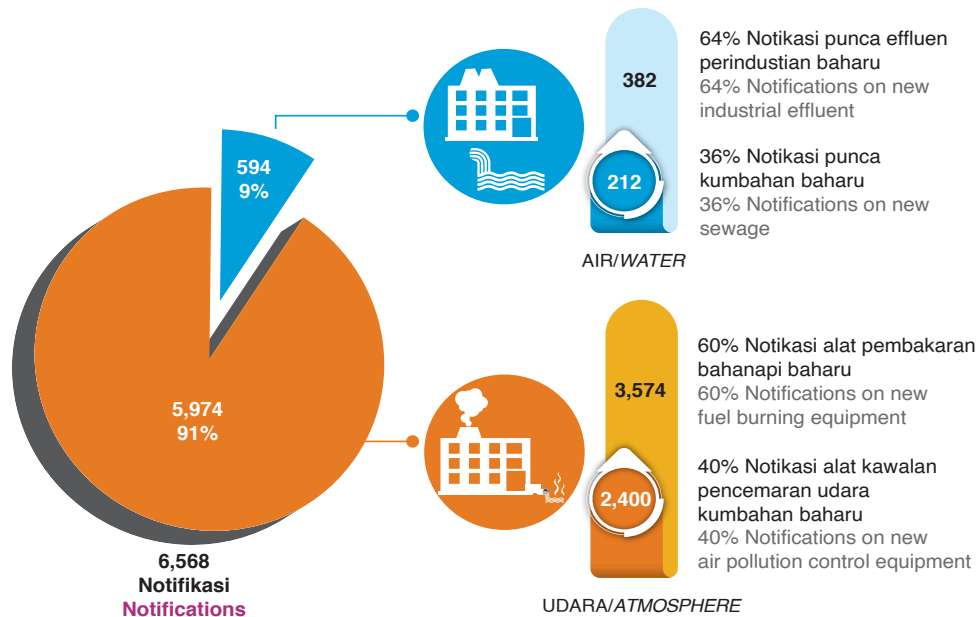
From DOE headquarters, the environmental inputs also provided to relevant agencies such as Ministry of Housing and Local Government, MIDA, Ministry of Domestic Trade and Consumer Affairs and Ministry of Water, Land and Natural Resources in relation to development planning coordination, local plans, national physical plan study, foreign and local industrial investment, environmentally sensitive areas study, oil and gas field development, development activities in the highlands etc.

Written Notification And Approval

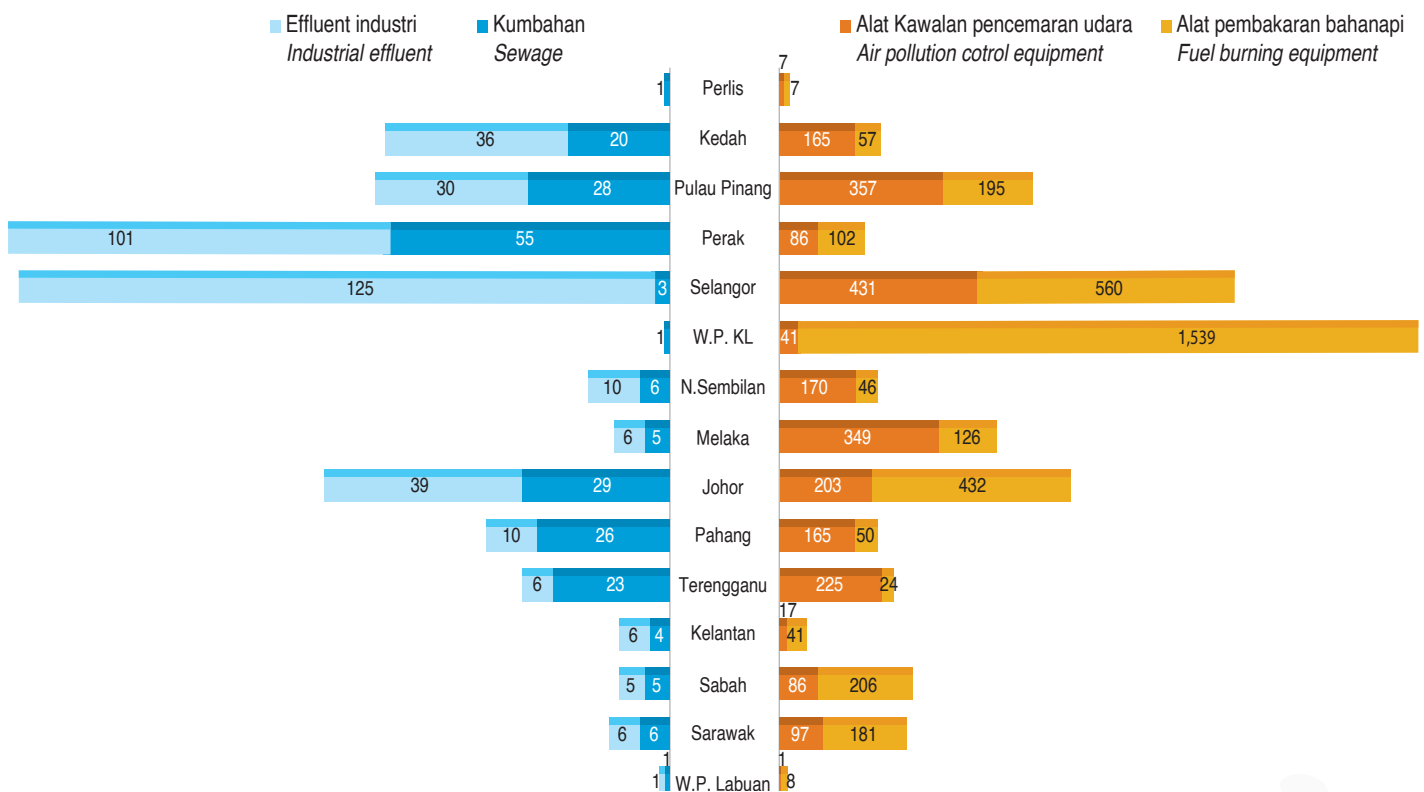
The Environmental Quality (Sewage) Regulations 2009 and the Environmental Quality (Industrial Effluents) Regulations 2009 require the written notifications to be submitted to the Director General of Environmental Quality before the constructions of sewage/industrial effluent treatment system.

Whereas Regulations Environmental Quality (Clean Air) Regulations 2014 require the prior written approval is obtained from the Director General of Environment before the installation of fuel burning equipment and chimney.

In 2018, DOE has received 212 written notifications for the construction of effluent treatment plants, 382 written notifications for new or altered sources of discharges of industrial effluent or mixed effluents and 2,400 applications for installation of air pollution control equipment. In addition, the DOE has also processed a total of 3,574 applications for written approval for the installation of fuel burning equipment such as boilers and generator sets (**Figure 3.7 and Figure 3.8**).



Rajah 3.7 : Pemberitahuan bilangan bertulis bagi pelepasan kumbahan, efluen perindustrian, alat pembakaran bahan api, dan alat kawalan pencemaran udara, 2018
 Figure 3.7 : Notification for sewage discharge, industrial effluent, fuel burning equipment, and air pollution control equipment, 2018



Rajah 3.8 : Bilangan notifikasi bagi pelepasan kumbahan, efluen perindustrian, alat pembakaran bahan api, dan alat kawalan pencemaran udara mengikut negeri, 2018
 Figure 3.8 : Notification for sewage discharge, industrial effluent, fuel burning equipment, and air pollution control equipment by state, 2018

Pembentukan Garis Panduan EIA

Pada tahun 2018, enam (6) Garis Panduan telah dikeluarkan berikutan pindaan kepada Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan kepada Alam Sekeliling) 2015 pada 3 Disember 2018 iaitu;

- *Environmental Impact Assessment Guidelines For Development of Port*
- *Environmental Impact Assessment Guidelines For Land Reclamation And Dredging*
- *Environmental Impact Assessment Guidelines For Quarry And Mining*
- *Environmental Impact Assessment Guidelines for Petroleum Industries*
- *Environmental Impact Assessment Guidelines for Petrochemical Industries*
- *Environmental Impact Assessment Guidelines for Radioactive Materials and Radioactive Wastes*

Objektif garis panduan ini adalah untuk membantu jururunding EIA menjalankan penilaian impak alam sekitar untuk aktiviti pembangunan yang berkaitan, serta menjadi rujukan dan panduan kepada semua pihak, terutama pemaju projek serta pihak yang berkepentingan dalam memastikan pembangunan yang dirancang tidak memberi kesan yang signifikan ke atas alam sekitar dan pada masa yang sama akan memastikan bahawa pematuhan sendiri dilaksanakan dengan jayanya.

Development Of EIA-Related Guidelines

In 2018, six (6) Guidelines were produced following the amendments to the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 on 3rd December 2018;

- *Environmental Impact Assessment Guidelines For Development of Port*
- *Environmental Impact Assessment Guidelines For Land Reclamation And Dredging*
- *Environmental Impact Assessment Guidelines For Quarry And Mining*
- *Environmental Impact Assessment Guidelines for Petroleum Industries*
- *Environmental Impact Assessment Guidelines for Petrochemical Industries*
- *Environmental Impact Assessment Guidelines for Radioactive Materials and Radioactive Wastes*

The objective of these guidelines is to assist EIA consultants to conduct environmental impact assessments for the relevant development activities, as well as a reference to all parties, especially project developers as well as stakeholders in ensuring that the planned development does not give significant impact on the environment and at the same time will ensure that Self-Regulation is implemented successful.

BAB 4

CHAPTER 4



PENGAWASAN KUALITI AIR MARIN KEBANGSAAN

Program Pengawasan Kualiti Air Marin Kebangsaan telah dimulakan di Semenanjung Malaysia pada tahun 1978 dan diperkembangkan ke Sabah dan Sarawak pada tahun 1985. Stesen-stesen pemantauan air marin diwujudkan di kuala-kuala sungai dan pantai-pantai bagi memantau status kualiti air marin berdasarkan kepada kegunaannya seperti kawasan rekreasi, perikanan dan taman-taman laut.

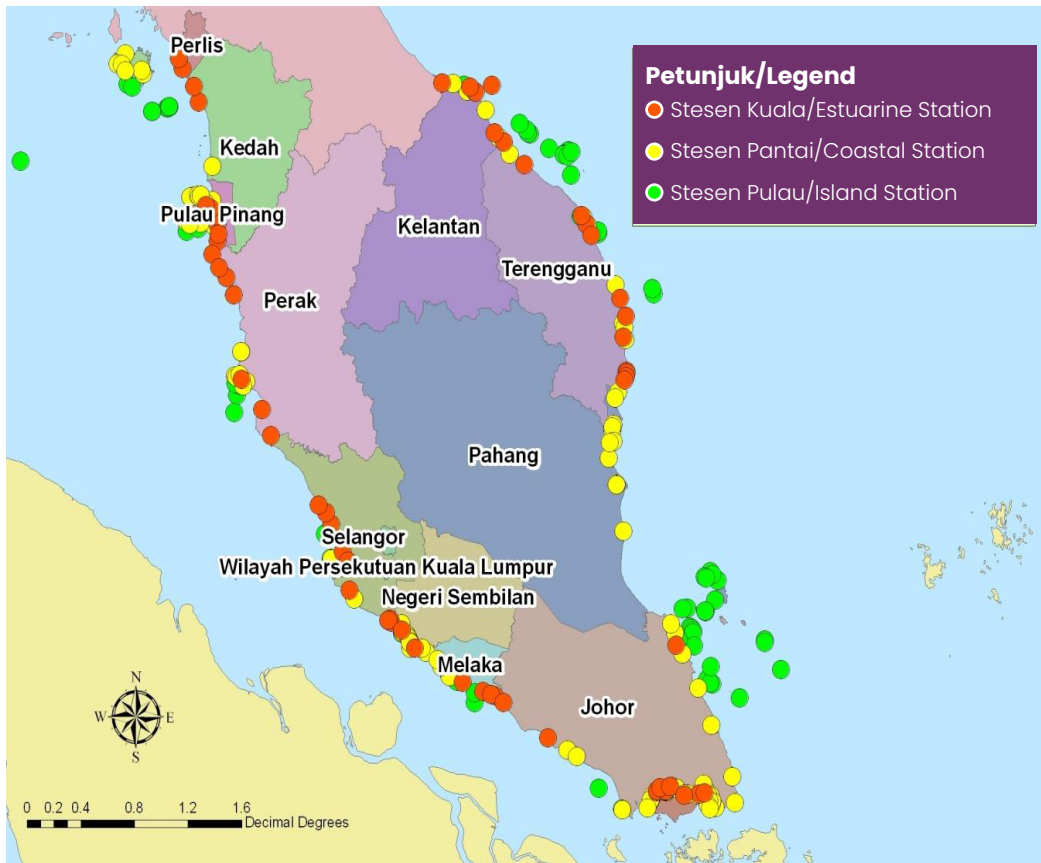
Pada tahun 2018, terdapat 273 stesen pengawasan di seluruh Malaysia termasuklah Perlis (2) stesen, Kedah (13) stesen, Pulau Pinang (24) stesen, Perak (14) stesen, Selangor 16 stesen, Negeri Sembilan (16) stesen, Melaka (17) stesen, Johor (35) stesen, Pahang (27) stesen, Terengganu (29) stesen, Kelantan (12) stesen, Sarawak (37) stesen, Sabah (26) stesen, dan W.P Labuan (5) stesen (**Peta 4.1(a), Peta 4.1(b) dan Jadual 4.1**).

MARINE WATER QUALITY MONITORING

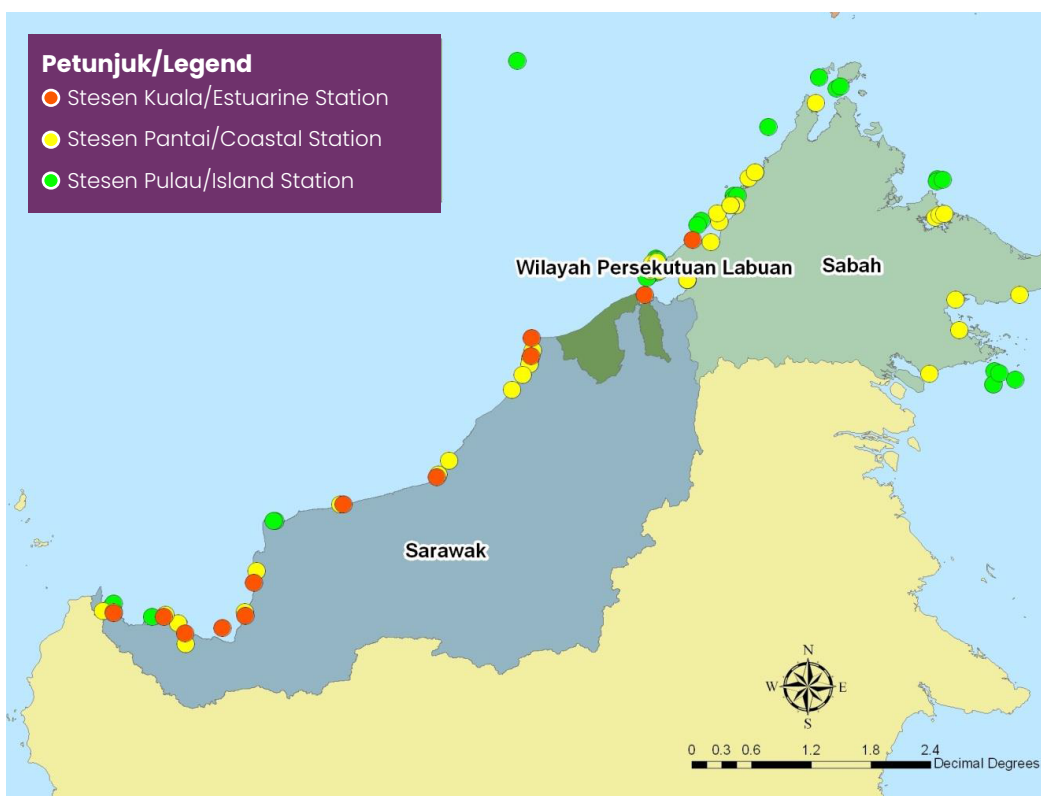
Marine water quality monitoring was established in Peninsular Malaysia in 1978 and was extended to cover Sabah and Sarawak in 1985. The Monitoring stations were created at estuaries and coastal areas to monitor marine water quality status with respect to their beneficial uses such as recreation, fishing and marine parks.

In 2018, a total of 273 monitoring stations was set up throughout Malaysia which include Perlis (2) stations, Kedah (13) stations, Pulau Pinang (24) stations, Perak (14) stations, Selangor (16) stations, Negeri Sembilan (16) stations, Melaka (17) stations, Johor (35) stations, Pahang (27) stations, Terengganu (29) stations, Kelantan (12) stations, Sarawak (37) stations, Sabah (26) stations, and F.T Labuan (5) stations (**Map 4.1(a), Map 4.1(b) and Table 4.1**).





Peta 4.1(a) : Taburan Stesen Pemantauan Kualiti Air Marin Semenanjung Malaysia, 2018
 Map 4.1(a) : Distribution of Marine Water Quality Stations Peninsular Malaysia, 2018



Peta 4.1(b) : Taburan Stesen Pengawasan Kualiti Air Marin Sabah dan Sarawak, 2018
 Map 4.1(b) : Distribution of Marine Water Quality Stations Sabah dan Sarawak, 2018



Jadual 4.1 : Stesen Pemantauan Kualiti Air Marin Kebangsaan, 2018
Table 4.1 : Marine Water Quality Monitoring Stations, 2018

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Perlis	2	Kuala Estuary	Kuala Sungai Perlis	6401901	MMRE001	6.400070	100.119000
			Kuala Sungai Baru	6201902	MMRE002	6.332420	100.150000
Kedah	4	Kuala Estuary	Kuala Kedah	6102908	MMKE001	6.104820	100.282000
			Kuala Jerlun	6302925	MMKE002	6.210500	100.238000
			Kuala Segantang Garam*	NA	MMKE003	5.678690	100.373000
			Kuala Sungai Muda*	NA	MMKE004	5.577350	100.341000
	9	Pantai Coastal	Pantai Merdeka	5603905	MMKC001	5.669760	100.369000
			Langkawi Island Resort	6399914	MMKC002	6.296690	99.861000
			Pantai Kok	6397922	MMKC003	6.366070	99.679100
			Pantai Kuah	6398925	MMKC004	6.313553	99.851419
			Pantai Pasir Tengkorak	6499701	MMKC005	6.431230	99.726100
			Pantai Teluk Burau	6396923	MMKC006	6.363910	99.668500
			Pantai Teluk Nibong	6497915	MMKC007	6.360220	99.702200
			Pantai Tengah	6297903	MMKC008	6.279750	99.727500
			Pantai Beras Basah*	NA	MMKC009	6.230860	99.718000
Pulau Pinang	7	Kuala Estuary	Kuala Sungai Jawi	5204901	MMPE001	5.280560	100.417000
			Kuala Sungai Juru	5303904	MMPE002	5.338890	100.406000
			Kuala Sungai Kerian	5104901	MMPE003	5.170340	100.424000
			Kuala Sungai Pinang	5403934	MMPE004	5.400000	100.335000
			Kuala Sungai Perai	5303908	MMPE005	5.383330	100.367000
			Kuala Sungai Tengah	5204935	MMPE006	5.211390	100.425000
			Kuala Sungai Pinang (Balik Pulau)	5202929	MMPE007	5.391550	100.186000

NEGERI STATE	BIL STESEN NO OF STATION	KLASSIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Pulau Pinang	17	Pantai Coastal	Gertak Sanggul	5201919	MMPC001	5.277320	100.194000
			Kawasan Perindustrian Bayan Lepas 1	5303932	MMPC002	5.309510	100.301000
			Pantai Bersih	5403906	MMPC003	5.441670	100.378000
			Pantai Miami	5502901	MMPC004	5.479230	100.268000
			Pantai Pasir Panjang	5201938	MMPC005	5.297220	100.183000
			Batu Feringgi (Casuarina)	5402904	MMPC006	5.469440	100.242000
			Luar Pantai Teluk Bahang	5402930	MMPC007	5.462000	100.213000
			Persiaran Gurney	5403902	MMPC008	5.437300	100.313000
			Rumah Pam Baru Perai	5304927	MMPC009	5.354170	100.387000
			Rumah Pam Lama Perai	5303926	MMPC010	5.334450	100.310000
			Selat PP Selatan (Jelutong)	5303911	MMPC011	5.391080	100.329000
			Tanjung Bungah	5402937	MMPC012	5.467420	100.281000
			Teluk Tempoyak	5202923	MMPC013	5.468560	100.294000
			Batu Maung	5202901	MMPC014	5.287831	100.292314
			Pantai Sungai Batu Ferringhi 3*	NA	MMPC015	5.480744	100.253394
			Pantai Sungai Batu Ferringhi 2*	NA	MMPC016	5.477190	100.249000
			Pantai Sungai Batu Ferringhi 1*	NA	MMPC017	5.472800	100.244000
Perak	6	Kuala Estuary	Kuala Sungai Manjung	4205930	MMAE001	4.248410	100.594000
			Kuala Sungai Gula	4906926	MMAE002	4.922690	100.467000
			Kuala Sungai Kurau	4994919	MMAE003	4.994810	100.415000
			Kuala Sungai Tanjung Piandang	5003921	MMAE004	5.076610	100.374000
			Kuala Sungai Sepetang	4806925	MMAE005	4.775600	100.588000
			Kuala Sungai Perak	4007901	MMAE006	4.000020	100.756000



NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Perak	8	Pantai Coastal	Pantai Pasir Bogak	4205908	MMAC001	4.211760	100.551000
			Pantai Teluk Dalam	4205928	MMAC002	4.250000	100.556000
			Pantai Teluk Batik	4205932	MMAC003	4.187320	100.606000
			Pantai Tanjung Batu	4406927	MMAC004	4.426590	100.595000
			Pantai Teluk Rubiah*	NA	MMAC005	4.160160	100.622000
			Pantai Damai Laut*	NA	MMAC006	4.264120	100.589000
			Pantai Teluk Senangin*	NA	MMAC007	4.293870	100.582000
			Pantai Pasir Panjang	4205924	MMAC008	4.347970	100.568000
Selangor	10	Kuala Estuary	Kuala Sungai Sepang	2517922	MMBE001	2.595750	101.713000
			Kuala Sungai Sepang (Kecil)	2612928	MMBE002	2.609870	101.685000
			Kuala Sungai Sepang (Kawalan)	2616926	MMBE003	2.597490	101.690000
			Kuala Sungai Langat (Jugra)	2814925	MMBE004	2.802400	101.407000
			Kuala Sungai Klang	3013909	MMBE005	3.001910	101.389000
			Kuala Sungai Langat (Lumut)	2913903	MMBE006	2.966800	101.309000
			Kuala Sungai Buloh	3212930	MMBE007	3.255040	101.300000
			Kuala Sungai Selangor	3312915	MMBE008	3.333330	101.225000
			Kuala Sungai Tengi	3311931	MMBE009	3.396180	101.167000
			Kuala Sungai Bernam	3808924	MMBE010	3.850000	100.817000
	6	Pantai Coastal	Pantai Bagan Lalang	2616927	MMBC001	2.605400	101.687000
			Pantai Morib	2712902	MMBC002	2.750000	101.439000
			Selat Pulau Babi	3012929	MMBC003	3.007660	101.273000
			Selat Klang Utara	3013908	MMBC004	3.028180	101.351000
			Pantai Remis*	NA	MMBC005	3.200730	101.302000
			Pantai Klanang*	NA	MMBC006	2.789270	101.409000

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Negeri Sembilan	2	Kuala Estuary	Kuala Sungai Linggi	2319901	MMNE001	2.391010	101.973000
			Kuala Sungai Lukut	2517910	MMNE002	2.578020	101.788000
	14	Pantai Coastal	Bagan Pinang	2518915	MMNC001	2.508230	101.828000
			Telok Sinting	2419908	MMNC002	2.415220	101.941000
			Port Dickson Bandar	2517907	MMNC003	2.520010	101.798000
			Port Dickson Batu 4	2518937	MMNC004	2.499710	101.837000
			Port Dickson Batu 5	2418906	MMNC005	2.495850	101.838000
			Port Dickson Batu 6	2418916	MMNC006	2.480790	101.847000
			Port Dickson Batu 7	2418905	MMNC007	2.461230	101.851000
			Port Dickson Batu 8	2418912	MMNC008	2.454150	101.854000
			Port Dickson Batu 10	2418914	MMNC009	2.417060	101.856000
			Port Dickson Janakuasa TNB	2517909	MMNC010	2.542370	101.798000
			Telok Pelanduk	2419917	MMNC011	2.416630	101.892000
			Pantai Cermin	2416918	MMNC012	2.414990	101.861000
			Pantai Teluk Kemang*	NA	MMNC013	2.447770	101.854000
			Pantai Seri Purnama*	NA	MMNC014	2.443130	101.855000
Melaka	8	Kuala Estuary	Kuala Sungai Melaka	2123903	MMME001	2.185720	102.242000
			Kuala Sungai Sri Melaka	2121914	MMME002	2.206470	102.198000
			Kuala Sungai Merlimau	2124912	MMME003	2.126890	102.414000
			Kuala Sungai Kesang	2186905	MMME004	2.098140	102.489000
			Kuala Sungai Sebatu	2186904	MMME005	2.107530	102.462000
			Kuala Sungai Melaka 2*	NA	MMME006	2.186872	102.243231
			Kuala Sungai Baru*	NA	MMME007	2.352440	102.033000
			Kuala Sungai Lereh	2221922	MMME008	2.220030	102.176000



NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Melaka	9	Pantai Coastal	Pantai Rombang	2221916	MMMC001	2.227280	102.148000
			Pantai Kundur	2221908	MMMC002	2.243190	102.140000
			Pantai Tanjung Bidara	2320909	MMMC003	2.290750	102.088000
			Teluk Gong	2320902	MMMC004	2.339830	102.056000
			Pulau Melaka Point A1	2121915	MMMC005	2.179920	102.243000
			Pulau Melaka Point A2	2121915	MMMC006	2.176440	102.252000
			Pulau Melaka Point B1	2121916	MMMC007	2.183320	102.248000
			Pulau Melaka Point B2	2121916	MMMC008	2.181300	102.255000
			Pantai Klebang	-	MMMC009	2.216070	102.191000
Johor	6	Kuala Estuary	Kuala Sungai Segget	1437919	MMJE001	1.455830	103.766000
			Kuala Sungai Kim-Kim	1439965	MMJE002	1.435140	103.924000
			Kuala Sungai Johor	1440916	MMJE003	1.484440	104.023000
			Kuala Sungai Batu Pahat	1729930	MMJE004	1.814510	102.890000
			Kuala Sungai Muar	2024932	MMJE005	2.052120	102.552000
			Kuala Sungai Mersing	2438905	MMJE006	2.436810	103.842000
	10	Pantai Coastal	Tanjung Bin	1336975	MMJC001	1.324560	103.557000
			Pelabuhan Tanjung Pelepas	1438943	MMJC002	1.353610	103.543000
			Hadapan Jabatan Laut	1438918	MMJC003	1.382750	103.535000
			Pantai Stulang Laut	1437951	MMJC004	1.467220	103.779000
			Jeti Teluk Jawa	1438918	MMJC005	1.473540	103.848000
			Pelabuhan Pasir Gudang	1428939	MMJC006	1.432550	103.899000
			Hadapan HSAJB	1437920	MMJC007	1.456440	103.746000
			Pantai Lido	1437921	MMJC008	1.465560	103.725000
			Pantai Teluk Mahkota	1841911	MMJC009	1.897810	104.105000
			Pantai Tanjung Leman	2140694	MMJC010	2.145280	104.007000

NEGERI STATE	BIL STESEN NO OF STATION	KLASSIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Johor	19	Pantai Coastal	Pantai Sri Pantai	2339960	MMJC011	2.379170	103.889000
			Tanjung Merak	1441968	MMJC012	1.362750	104.110000
			Tanjung Pengelih	1441967	MMJC013	1.370750	104.089000
			Pantai Tanjong Stapa	1341961	MMJC014	1.342500	104.136000
			Pantai Teluk Gorek	2538958	MMJC015	2.582500	103.805000
			Pantai Air Papan	2538959	MMJC016	2.518060	103.833000
			Jeti Kukup	1334925	MMJC017	1.325000	103.441000
			Pasir Gogok	1441966	MMJC018	1.417440	104.100000
			Tanjung Buai	1340973	MMJC019	1.496690	104.045000
			Pantai Desaru	1542914	MMJC020	1.546670	104.261000
			Tanjung Sepang	1443969	MMJC021	1.391920	104.108000
			Tanjung Penyusup	1444920	MMJC022	1.370250	104.280000
			Pantai Sungai Lurus	1730962	MMJC023	1.728330	103.029000
			Punggur	1531974	MMJC024	1.684720	103.098000
			Pantai Penyabung*	NA	MMJC025	2.648740	103.750000
			Tanjung Resang*	NA	MMJC026	2.573970	103.817000
			Tanjung Balau*	NA	MMJC027	1.612690	104.261000
			Batu Layar*	NA	MMJC028	1.446110	104.296000
			Tanjung Sengat*	NA	MMJC029	1.560730	104.030000
Pahang	5	Kuala Estuary	Kuala Kuantan*	NA	MMCE001	3.804820	103.343000
			Kuala Rompin Kecil*	NA	MMCE002	2.822180	103.485000
			Kuala Pahang*	NA	MMCE003	3.530440	103.472000
			Kuala Nenas*	NA	MMCE004	3.080990	103.441000
			Kuala Sungai Balok*	NA	MMCE005	3.934920	103.377000



NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Pahang	22	Pantai Coastal	Pantai Cherating (Club Med A)	4133903 (A)	MMCC001	4.141970	103.409000
			Pantai Cherating (Club Med B)	4133903 (B)	MMCC002	4.127860	103.406000
			Pantai Cherating (Legend A)	4133942 (A)	MMCC003	4.111670	103.386000
			Pantai Cherating (Legend B)	4133942 (B)	MMCC004	4.104610	103.386000
			Pantai Muhibbah Balok A	3933901 (A)	MMCC005	3.941630	103.385000
			Pantai Muhibbah Balok B	3933901 (B)	MMCC006	3.923530	103.375000
			Pantai Batu Hitam A	3833915 (A)	MMCC007	3.890310	103.369000
			Pantai Batu Hitam B	3833915 (B)	MMCC008	3.886000	103.368000
			Pantai Berserah A	3933941 (A)	MMCC009	3.882280	103.368000
			Pantai Berserah B	3933941 (B)	MMCC010	3.876000	103.369000
			Pantai Teluk Cempedak A	3833910 (A)	MMCC011	3.816670	103.374000
			Pantai Teluk Cempedak B	3833910 (B)	MMCC012	3.810190	103.374000
			Pantai Teluk Gelora A	3833909 (A)	MMCC013	3.803030	103.364000
			Pantai Teluk Gelora B	3833909 (B)	MMCC014	3.802780	103.351000
			Pantai Sepat A	3737915	MMCC015	3.701500	103.339000
			Pantai Sepat B	3633916	MMCC016	3.698860	103.340000
			Pantai Legenda A	3534943 (A)	MMCC017	3.617980	103.413000
			Pantai Legenda B	3534943 (B)	MMCC018	3.550290	103.467000
			Pantai Kuala Api-API	3235917	MMCC019	3.281190	103.433000
			Pantai Tanjung Batu	3334915	MMCC020	3.205030	103.447000
			Pantai Chendor*	NA	MMCC021	4.164190	103.414000
			Pantai Lanjut*	NA	MMCC022	2.843780	103.472000

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Terengganu	13	Kuala Estuary	Kuala Sungai Besut	5825902	MMTE001	5.834110	102.558000
			Kuala Sungai Dungun	4734918	MMTE002	4.781080	103.428000
			Kuala Sungai Ibai	5231949	MMTE003	5.288990	103.176000
			Kuala Sungai Kerteh	4534922	MMTE004	4.514410	103.456000
			Kuala Sungai Marang	5232911	MMTE005	5.209440	103.214000
			Kuala Sungai Paka	4634920	MMTE006	4.655000	103.444000
			Kuala Sungai Setiu	5627953	MMTE007	5.651890	102.764000
			Kuala Sungai Terengganu	5331907	MMTE008	5.339790	103.152000
			Kuala Sungai Kemaman/ Chukai	4234929	MMTE009	4.226370	103.447000
			Tioxide Utara (Kg. Bukit Kuang, Kijal)	4234950	MMTE010	4.278310	103.479000
			Tioxide Tengah (Pupuk Semangat, Kijal)	4234951	MMTE011	4.270500	103.478000
			Tioxide Selatan (KSB, T. Kalong)	4234952	MMTE012	4.251140	103.466000
			Pulau Duyung	5231908	MMTE013	5.334890	103.129000
	11	Pantai Coastal	Pantai Batu Buruk	5331935	MMTC001	5.326540	103.156000
			Pantai Bukit Keluang	5825903	MMTC002	5.806760	102.610000
			Pantai Chendering	5231934	MMTC003	5.271040	103.189000
			Pantai Rantau Abang	4833917	MMTC004	4.872370	103.393000
			KIPC Utara	4634954	MMTC005	4.612850	103.452000
			KIPC Tengah	4534955	MMTC006	4.582270	103.466000
			KIPC Selatan	4534956	MMTC007	4.553600	103.477000
			Pantai Rhu 10*	NA	MMTC008	5.650110	102.774000
			Pantai Tok Jembal*	NA	MMTC009	5.400420	103.107000
			Pantai Kelului*	NA	MMTC010	5.190430	103.226000
			Pantai Teluk Ketapang*	NA	MMTC011	5.384920	103.118000



NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Terengganu	5	Pantai Coastal	Pantai Kuala Abang*	NA	MMTC012	4.827430	103.420000
			Pantai Teluk Kalong*	NA	MMTC013	4.283330	103.478000
			Pantai Sura*	NA	MMTC014	4.770190	103.424000
			Pantai Tanjung Bidara*	NA	MMTC015	4.785060	103.438000
			Pantai Kemasik*	NA	MMTC016	4.455950	103.449000
Kelantan	6	Kuala Estuary	Kuala Sungai Golok	6220911	MMDE001	6.232860	102.090000
			Kuala Sungai Kelantan	6222901	MMDE002	6.216850	102.237000
			Kuala Sungai Pengkalan Chepa	6223912	MMDE003	6.185740	102.303000
			Kuala Sungai Pengkalan Datu	6123913	MMDE004	6.169280	102.344000
			Kuala Sungai Kemasin	5824914	MMDE005	6.130060	102.371000
			Kuala Sungai Semerak*	NA	MMDE006	5.897340	102.486000
	6	Pantai Coastal	Pantai Seri Tujuh	6221910	MMDC001	6.228040	102.117000
			Pantai Cahaya Bulan	6122903	MMDC002	6.196460	102.277000
			Pantai Sabak	6123909	MMDC003	6.179620	102.322000
			Pantai Irama Bachok	6024908	MMDC004	6.066860	102.400000
			Pantai Bisikan Bayu	5825905	MMDC005	5.862590	102.518000
			Pantai Melawi*	NA	MMDC006	5.994650	102.441000
Sarawak	7	Kuala Estuary	Kuala Sungai Semantan	1898901	MMQE001	1.811530	109.781000
			Kuala Sungai Sarawak	1604907	MMQE002	1.641030	110.490000
			Kuala Sungai Bako	1704905	MMQE003	1.683060	110.423000
			Kuala Sungai Santubong	1702903	MMQE004	1.701270	110.297000
			Kuala Batang Krian (Kabong)	1710922	MMQE005	1.788890	111.099000
			Kuala Batang Rejang	2111909	MMQE006	2.122780	111.189000
			Kuala Mukah	2920920	MMQE007	2.914660	112.095000

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Sarawak	7	Kuala Estuary	Kuala Batang Kemena	3130911	MMQE008	3.181500	113.029000
			Kuala Tanjung Similajau	3431903	MMQE009	3.517920	113.301000
			Kuala Sungai Panipah	3332904	MMQE010	3.469670	113.261000
			Kuala Pantai Nyalau	3431903	MMQE011	3.642830	113.383000
			Kuala Sungai Baram	4539919	MMQE012	4.597000	113.969000
			Kuala Sungai Miri	4349915	MMQE013	4.399320	113.978000
			Kuala Sungai Trusan*	NA	MMQE014	2.875530	111.878000
	20	Pantai Coastal	Pantai Sematan	1898902	MMQC001	1.827220	109.775000
			Pantai Pandan	1824918	MMQC002	1.765530	109.865000
			Pantai Pasir Putih	1604910	MMQC003	1.661530	110.487000
			Pantai Bako	1704906	MMQC004	1.718060	110.442000
			Pantai Damai	1702904	MMQC005	1.750260	110.308000
			Pantai Tanjung Kembang	1810923	MMQC006	1.824440	111.096000
			Pantai Harmoni Mukah	2920921	MMQC007	2.909720	112.056000
			Pantai Tanjung Batu	3132602	MMQC008	3.210640	113.043000
			Pantai Likau	3230915	MMQC009	3.344260	113.148000
			Pantai Emas	3331903	MMQC010	3.441060	113.224000
			Pantai Piasau	4539918	MMQC011	4.437870	113.994000
			Pantai Brighton	4449917	MMQC012	4.378780	113.970000
			Pantai Esplaned	4339920	MMQC013	4.324580	113.961000
			Pantai Beraya	4238921	MMQC014	4.192480	113.877000
			Pantai Bungai	4137922	MMQC015	4.064570	113.782000
			Pantai Belawai	2212913	MMQC016	2.220940	111.208000
			Pantai Mukah*	NA	MMQC017	2.939740	112.167000
			Tanjung Kidurong*	NA	MMQC018	3.256010	113.049000
			Pasir Pandak*	NA	MMQC019	1.698830	110.301000
			Rambungan*	NA	MMQC020	1.703260	110.108000



NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Sarawak	3	Pantai Coastal	Sri Tanjung Lawas*	NA	MMQC021	4.971620	115.242000
			Pantai Luak*	NA	MMQC022	4.284270	113.938000
			Pasir Panjang*	NA	MMQC023	3.095930	112.836000
Sabah	2	Kuala Estuary	Kuala Penyu	5453901	MMSE001	5.572730	115.605000
			Muara Sungai Inanam	5050905	MMSE002	6.012720	116.110000
	20	Pantai Coastal	Pantai Teluk Brunei 1	5053901	MMSC001	5.145790	115.520000
			Pantai Teluk Brunei 2	5053902	MMSC002	5.117980	115.528000
			Pantai Teluk Brunei 3	5053903	MMSC003	5.161070	115.496000
			Pantai Teluk Brunei 4	5053904	MMSC004	5.175850	115.472000
			Pantai Teluk Brunei 5	5053905	MMSC005	5.203520	115.435000
			Pantai Teluk Brunei 6	5053906	MMSC006	5.094190	115.527000
			Borneo Golf Seawater	5355901	MMSC007	5.550000	115.784000
			Pantai Manis Papar	5555901	MMSC008	5.744250	115.893000
			Pantai Melinsung	5565902	MMSC009	5.804740	115.975000
			Pantai Tanjung Aru (Roll Skating)	5656902	MMSC010	5.933020	116.017000
			Pantai Tanjung Aru (No. 3)	5656903	MMSC011	5.888760	116.015000
			Pantai Lok Kawi	5656904	MMSC012	5.860130	116.027000
			Pantai Dalit Tuaran	6161901	MMSC013	6.188750	116.166000
			Mangrove Paradise	6161902	MMSC014	6.258570	116.221000
			Pantai Sabandar	6161903	MMSC015	6.203530	116.175000
			Pantai Bak-Bak Kudat	6665901	MMSC016	6.945650	116.842000
			Pasir Putih Sandakan	5580901	MMSC017	5.824230	118.086000
			Pantai TLDM	5580902	MMSC018	5.838960	118.127000
			Pantai Batu Sapi	5580903	MMSC019	5.795120	118.040000
			Pantai Ulu Tungku	5085901	MMSC020	5.012930	118.890000

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN LAMA OLD STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Sabah	4	Pantai Coastal	Pantai Sarina Kunak	4481901	MMSC021	4.661390	118.284000
			Pantai Kg. Lamak	4581902	MMSC022	4.969972	118.236731
			Pantai Tinagat	4473901	MMSC023	4.222780	117.984000
			Pantai Tanjung Aru (Rest Lido)	5656901	MMSC024	5.910840	116.008000
Labuan	5	Pantai Coastal	Pulau Papan	5151905	MMLC001	5.254900	115.268000
			Kiamsam	5151906	MMLC002	5.255260	115.175000
			Sungai Pagar	5151907	MMLC003	5.273410	115.167000
			Layang-Layangan	5251902	MMLC004	5.334220	115.193000
			Tanjung Aru	5251903	MMLC005	5.350600	115.244000

Nota/Note:

* (Stesen baru/ New station)

NA (Tidak berkenaan/ Not available)

Kuala/ESTUARINE : 85
Pantai/COASTAL : 188

Jumlah/Total : 273



PENGAWASAN KUALITI AIR MARIN PULAU-PULAU

Malaysia dikurniakan dengan banyak pulau yang kaya dengan sumber akuatik. Kualiti air marin pula merupakan aspek yang penting dalam pemuliharaan sumber semulajadi ini. Sehubungan dengan itu, Program Pengawasan Kualiti Air Marin Pulau-Pulau telah dimulakan pada Julai 1998. Pada **tahun 2018**, program ini telah dilaksanakan di sekitar **79** buah pulau terpilih dan melibatkan **95** stesen pengawasan.

Pengukuran parameter-parameter fizikal kualiti air marin dibuat secara *in-situ* seperti suhu, pH, konduktiviti, kemasinan, oksigen terlarut dan kekeruhan manakala **23** parameter yang dianalisis di makmal pula adalah seperti jumlah pepejal terampai, *Escherichia coli* (*E.coli*), nitrat, fosfat, jumlah karbon organik, minyak dan gris logam berat termasuklah Merkuri (Hg), Kadmium (Cd), Kromium (Cr), Kuprum (Cu), Plumbum (Pb), Arsenik (As) dan Tributyltin (TBT) serta Triphenyltin (TPT) (**Jadual 4.2**). Percontohan bebola tar di pantai juga dilaksanakan.

ISLAND MARINE WATER QUALITY MONITORING

Malaysia is endowed with many islands with rich marine aquatic resources. The quality of marine water plays as an important aspect in the conservation of such resources. As a step towards this, The Island Marine Water Quality Monitoring Programme was established in July 1998. In **2018**, the programme was conducted at **79** selected islands covering **95** monitoring stations.

Marine water quality monitoring includes measurement of in-situ parameters such as temperature, pH, conductivity, salinity, dissolved oxygen, turbidity. Meanwhile, laboratory analysis involves **23** other parameters such as total suspended solids, *Escherichia coli* (*E. coli*), nitrate, phosphate, total organic carbon, oil and grease, heavy metals including Mercury (Hg), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Arsenic (As) and Tributyltin (TBT) as well as Triphenyltin (TPT) (**Table 4.2**). Tarball sampling on beaches was also conducted.



Jadual 4.2 : Stesen-Stesen Pemantauan Kualiti Air Marin Pulau, 2018
Table 4.2 : Island Water Quality Monitoring Stations, 2018

NEGERI STATE	BIL PULAU NO OF ISLAND	BIL. STESEN NO. OF STATION	PULAU ISLAND	ID STESEN LAMA OLD STATION ID	ID STESEN BARU NEW STATION ID	KATEGORI CATEGORY	LOKASI LOCATION	
							LATITUD LATITUDE	LONGITUD LONGITUDE
Kedah	10	1	Singa Besar	7KR01	MMKR001	R	6.226040	99.73540
		2	Dayang Bunting	7KR02	MMKR002	R	6.207250	99.78030
			Dayang Bunting 2*	NA	MMKR003	*	6.203111	99.78149
		1	Pulau Perak	7KP01	MMRP001	P	5.681450	98.93600
		1	Payar	7KM03	MMKM001	M	6.063530	100.04200
		1	Kaca	7KM04	MMKM002	M	6.071720	100.05200
		1	Segantang	7KM06	MMKM003	M	6.043530	99.92610
		4	Pantai Kuah	7KD07	MMKD001	D	6.308810	99.85110
			Pantai Chenang	7KD09	MMKD002	D	6.302670	99.71660
			Tanjung Rhu	7KD010	MMKD003	D	6.456810	99.82180
			Teluk Ewa	7KD08	MMKD004	D	6.434250	99.75500
		1	Pasir*	NA	MMKP001	*	6.453500	99.79490
		1	Gasing*	NA	MMKP002	*	6.454130	99.79020
		1	Dangli*	NA	MMKP003	*	6.447370	99.77760
Pulau Pinang	7	1	Tanjung Tokong*	NA	MMPP001	*	5.456290	100.31500
		3	Batu Maung	7PD01	MMPD001	D	5.285240	100.29200
			Padang Kota	7PD04	MMPD002	D	5.419210	100.34600
			Teluk Bahang	7PD03	MMPD003	D	5.460830	100.21400
		1	Aman	7PR05	MMPR001	R	5.267430	100.39400
		1	Jerejak	7PR06	MMPR002	R	5.333330	100.31700
		1	Kendi	7PR07	MMPR003	R	5.230380	100.18200
		1	Rimau	7PR08	MMPR004	R	5.244150	100.27300
		1	Gedong	7PR09	MMPR005	R	5.273460	100.39000
Perak	4	2	Pantai Teluk Gedong	7AR01	MMAR001	R	4.194210	100.58100
			Pantai Puteri Dewi	7AR02	MMAR002	R	4.253140	100.54400
		1	Pangkor Laut	7AR03	MMAR003	R	4.201590	100.54700
		1	Sembilan	7AR04	MMAR004	R	4.008530	100.54400
		1	Tukun Perak	7AP05	MMAP001	P	4.116890	100.56100



NEGERI STATE	BIL PULAU NO OF ISLAND	BIL. STESEN NO. OF STATION	PULAU ISLAND	ID STESEN LAMA OLD STATION ID	ID STESEN BARU NEW STATION ID	KATEGORI CATEGORY	LOKASI LOCATION	
							LATITUD LATITUDE	LONGITUD LONGITUDE
Selangor	3	1	Ketam	7BR01	MMBR001	R	3.018000	101.25800
		1	Angsa	7BR02	MMBR002	R	3.185560	101.21900
		1	Lumut	7BR03	MMBR003	R	2.998500	101.36200
Negeri Sembilan	1	1	Arang	7NP01	MMNP001	P	2.516470	101.79500
Melaka	3	2	Upeh (Point A)	7MR02	MMMR001	R	2.194890	102.20500
			Upeh (Point B)	7MR02	MMMR002	R	2.189750	102.20300
		2	Besar (Point A)	7MR01	MMMR003	R	2.116690	102.33200
			Besar (Point B)	7MR01	MMMR004	R	2.106720	102.32200
		2	Undan (Point A)	7MR03	MMMR005	R	2.048940	102.33200
			Undan (Point B)	7MR03	MMMR006	R	2.047280	102.33500
Johor	8	1	Setindan	7JR01	MMJR001	R	2.476640	103.85800
		1	Babi Tengah	7JR02	MMJR002	R	2.475490	103.95500
		1	Dayang	7JM03	MMJM001	M	2.470220	104.50400
		1	Nanga Besar	7JM08	MMJM002	M	2.270640	104.12900
		1	Sibu Tengah	7JM11	MMJM003	M	2.181920	104.09600
		1	Pemanggil	7JM15	MMJM004	M	2.569080	104.32600
		1	Kukup	7JP17	MMJP001	P	1.328310	103.43700
		1	Pisang	7JP18	MMJP002	P	1.468280	103.26300
Pahang	9	1	Tioman (Teluk Salang)	7CM02	MMCM001	M	2.775000	104.11700
		1	Tioman (Kg. Nipah)	7CM01	MMCM002	M	2.876370	104.15200
		1	Tulai	7CM05	MMCM003	M	2.905320	104.10700
		1	Labas	7CM07	MMCM004	M	2.895060	104.04700
		1	Cebeh	7CM04	MMCM005	M	2.930180	104.09900
		1	Sepui	7CM06	MMCM006	M	2.885980	104.06700
		1	Sembilang	7CM08	MMCM007	M	2.670060	103.91000
		1	Seri Buat	7CM03	MMCM008	M	2.700190	103.89800
		1	Tokong Bahara	7CM09	MMCM009	M	2.664240	104.06500

NEGERI STATE	BIL PULAU NO OF ISLAND	BIL. STESEN NO. OF STATION	PULAU ISLAND	ID STESEN LAMA OLD STATION ID	ID STESEN BARU NEW STATION ID	KATEGORI CATEGORY	LOKASI LOCATION	
							LATITUD LATITUDE	LONGITUD LONGITUDE
Terengganu	9	1	Gemia	7TR01	MMTR001	R	5.231060	103.26100
		1	Perhentian Besar (South)	7TM04	MMTM001	M	5.894480	102.73600
		2	Perhentian Besar (West)	7TM05	MMTM002	M	5.889310	102.75100
			Perhentian Kecil	7TM06	MMTM003	M	5.917920	102.72500
		2	Redang (North)	7TM07	MMTM004	M	5.775610	103.03700
			Redang (South)	7TM08	MMTM005	M	5.752530	103.00300
		1	Lang Tengah	7TM11	MMTM006	M	5.792470	102.89000
		1	Pinang	7TM12	MMTM007	M	5.747970	103.00300
		1	Ekor Tebu	7TM13	MMTM008	M	5.740440	103.02900
		1	Lima	7TM14	MMTM009	M	5.769860	103.05900
Kelantan	2	1	Kapas	7TM09	MMTM010	M	5.216970	103.26000
		1	Panjang	7DP01	MMDP001	P	6.207000	102.25800
Sarawak	3	1	Kundur	7DP02	MMDP002	P	6.189460	102.29200
		1	Satang	7QP01	MMQP001	P	1.777660	110.16500
		1	Talang- Talang Kecil	7QP02	MMQP002	P	1.893470	109.76700
Sabah	12	1	Talang- Talang Besar	7QP03	MMQP003	P	1.911030	109.77700
		1	Gaya	7SR01	MMSR001	R	6.013460	116.05100
		1	Mabul	7SR03	MMSR002	R	4.248770	118.63300
		2	Sipadan (N)	7SR04	MMSR003	R	4.117660	118.62800
			Sipadan (W)	7SR05	MMSR004	R	4.114170	118.62600
		1	Manukan	7SR09	MMSR005	R	5.973350	116.00500
		1	Tiga	7SR10	MMSR006	R	5.716610	115.65100
		1	Kapalai	7SR12	MMSR007	R	4.227460	118.68400
		1	Molleangan Besar	7SR14	MMSR008	R	7.082230	117.04400
		1	Banggi (South)	7SR15	MMSR009	R	7.111690	117.08800
		1	Banggi (East)	7SR20	MMSR010	R	7.136970	117.10700
		1	Balambangan	7SR16	MMSR011	R	7.232010	116.91300
		1	Mantanani Besar	7SR21	MMSR012	R	6.704930	116.35800
		1	Sapi	7SM08	MMSM001	M	6.007270	116.01000



NEGERI STATE	BIL PULAU NO OF ISLAND	BIL. STESEN NO. OF STATION	PULAU ISLAND	ID STESEN LAMA OLD STATION ID	ID STESEN BARU NEW STATION ID	KATEGORI CATEGORY	LOKASI LOCATION	
							LATITUD LATITUDE	LONGITUD LONGITUDE
Sabah	4	1	Kalampunian Besar	7SM11	MMSM002	M	5.748210	115.67600
		1	Selingan	7SP17	MMSP001	P	6.175350	118.05900
		1	Gulisan	7SP18	MMSP002	P	6.149570	118.05600
		1	Bakungan Kecil	7SP19	MMSP003	P	6.163910	118.10900
Labuan	4	1	Kuraman	7LM05	MMLM001	M	5.218750	115.14000
		1	Rusukan Besar	7LM07	MMLM002	M	5.190000	115.14200
		1	Rusukan Kecil	7LM06	MMLM003	M	5.201780	115.14800
		4	Pohon Batu	7LD01	MMLD001	D	5.380530	115.22900
			Water Front	7LD02	MMLD002	D	5.272750	115.24900
			Lubuk Temiang	7LD03	MMLD003	D	5.371870	115.24800
			Ranca-Ranca	7LD04	MMLD004	D	5.241920	115.24000

Nota/Note:

* (Stesen baru/New station)

NA (Tidak berkenaan/Not available)

Jadual 4.3 : Parameter Kualiti Air Marin, 2018
Table 4.3 : Marine Water Quality Parameters, 2018

BIL NO	PARAMETER PARAMETERS	KOD CODE	UNIT UNIT
PENGUKURAN IN-SITU / IN-SITU MEASUREMENTS			
1	Oksigen Terlarut / Dissolved Oxygen	DO	mg/l
2	pH	pH	-
3	Kemasinan / Salinity	Sal	ppt
4	Suhu / Temperature	Temp	°C
5	Kekeruhan / Turbidity	Turb	NTU
6	Konduktiviti / Conductivity	Cond	mS/cm
PENGUKURAN MAKMAL / LABORATORY MEASUREMENT			
1	Jumlah Pepejal Terampai / Total Suspended Solid	TSS	mg/l
2	Minyak dan Gris / Oil and Grease	O&G	mg/l
3	Bebola Tar / Tarball	Tar	g/100m
4	Merkuri / Mercury	Hg	µg/l

BIL NO	PARAMETER PARAMETERS	KOD CODE	UNIT UNIT
5	Kadmium / Cadmium	Cd	µg/l
6	Kromium / Chromium	Cr ⁶⁺	µg/l
7	Kuprum / Copper	Cu	µg/l
8	Arsenik / Arsenic	As	µg/l
9	Plumbum / Lead	Pb	µg/l
10	Zink / Zinc	Zn	µg/l
11	Sianida / Cyanide	CN	µg/l
12	Amonia Tidak Terion / Unionized Ammonia	NH ₃	µg/l
13	Amoniakal Nitrogen / Ammoniacal Nitrogen	NH ₃ -N	µg/l
14	Nitrit / Nitrite	NO ₂	µg/l
15	Nitrat / Nitrate	NO ₃	µg/l
16	Fosfat / Phosphate	PO ₄	µg/l
17	Fenol / Phenol	Phenol	µg/l
18	Tributiltin / Tributyltin	TBT	µg/l
19	Total Coliform	TC	MPN/100
20	Faecal Coliform	FC	MPN/100
21	Escherichia coli	E.coli	MPN/100
22	Entrococci	-	MPN/100
23	Polycyclic Aromatic Hydrocarbons	PAHs	µg/l



PENGAWASAN KUALITI AIR DARATAN (SUNGAI)

Jabatan Alam Sekitar (JAS) melaksanakan program pengawasan kualiti air sungai sejak tahun 1978 dan secara komprehensif bermula tahun 1995 bertujuan menentukan status terkini kualiti air bagi sungai-sungai dan mengesan perubahannya dari semasa ke semasa.

Pada tahun 2018, rangkaian stesen pengawasan kualiti air sungai JAS adalah terdiri daripada 1,353 stesen yang terletak di 638 batang sungai di seluruh Negara seperti dalam **Jadual 4.4**. Sejumlah lima puluh lima (55) stesen daripada rangkaian stesen pengawasan kualiti air sungai tersebut adalah khusus bagi memantau kualiti air sungai di hulu muka sauk yang terpilih seperti dalam **Jadual 4.5**. Persampelan kualiti air sungai dijalankan secara berjadual dan mengikut kekerapan yang telah ditetapkan iaitu antara 4 hingga 12 kali setahun. Parameter-parameter kualiti air yang diukur merangkumi parameter fizikal, kimia dan biologi seperti **Jadual 4.6**.

SURFACE WATER (RIVER) QUALITY MONITORING

The Department of Environment (DOE) has implemented river water quality monitoring programme since 1978 and comprehensively starting 1995 to determine the river water quality status and detect changes over time.

In 2018, DOE's river water quality monitoring network comprised of 1,353 manual stations which are located at 638 rivers in Malaysia as shown in **Table 4.4**. Fifty five (55) stations from the network stations are specifically for the purpose of monitoring river water quality at upstream of selected water intakes for water supply facilities as listed in **Table 4.5**. River water samplings are carried out periodically from 4 to 12 times a year and were analysed and tested for a range of physical, chemical and biological parameters as shown in **Table 4.6**.

Jadual 4.4 : Senarai Lembangan Sungai dan Sungai-Sungai Yang Dipantau, 2018
Table 4.4 : List of the Catchments and Rivers Monitored, 2018

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Johor	22	103	Sg. Air Baloi	3	Sg. Air Baloi	3
			Sg. Batu Pahat	24	Sg. Amran	1
					Sg. Bantang	1
					Sg. Batu Pahat	1
					Sg. Bekok	6
					Sg. Berlian	1
					Sg. Chaah	1
					Sg. Kahang	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
					Sg. Lenik	1
					Sg. Merek	1
					Sg. Merpo	1
					Sg. Panchor	1
					Sg. Semberong	2
					Sg. Simpang Kanan	2
					Sg. Simpang Kiri	3
					Sg. Temehel	1
			Sg. Benut	7	Sg. Benut	4
					Sg. Parit Hj.Yassin	1
					Sg. Pinggan	1
					Sg. Ulu Benut	1
			Sg. Danga	2	Sg. Danga	2
			Sg. Endau	28	Sg. Anak Sg. Semberong	1
					Sg. Dengar	1
					Sg. Empangan Labong	1
					Sg. Endau	3
					Sg. Jasin	1
					Sg. Jebong	1
					Sg. Kahang	2
					Sg. Lenga	1
					Sg. Lenggong	2
					Sg. Mamai	1
					Sg. Melatai	1
					Sg. Mengkibol	3
					Sg. Paloh	1
					Sg. Pamol	1
					Sg. Selai	1
					Sg. Semberong	5
					Sg. Singol	1
					Sg. Tamok	1



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Jemaluang	2	Sg. Jemaluang	2
			Sg. Johor	43	Sg. Anak Sg. Sayong	2
					Sg. Belitong	1
					Sg. Berangan	1
					Sg. Bukit Besar	2
					Sg. Chemangar	1
					Sg. Johor	6
					Sg. Layang	1
					Sg. Layau Kiri	1
					Sg. Lebam	1
					Sg. Linggiu	1
					Sg. Pant	1
					Sg. Papan	1
					Sg. Pelepah	4
					Sg. Penggeli	2
					Sg. Remis	1
					Sg. Santi	1
					Sg. Sayong	4
					Sg. Sebol	1
					Sg. Seluyut	1
					Sg. Semangar	1
					Sg. Semenchu	1
					Sg. Sening	1
					Sg. Serai	1
					Sg. Telor	1
					Sg. Temoh	1
					Sg. Tiram	4
			Kaw. Pasir Gudang	5	Sg. Buluh	1
					Sg. Lato	1
					Sg. Masai	1
					Sg. Perembi	1
					Sg. Tukang Batu	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Kempas	2	Sg. Kempas	2
			Sg. Kim-Kim	2	Sg. Kim-Kim	2
			Sg. Mersing	4	Sg. Empangan Congok	1
					Sg. Mersing	3
			Sg. Paloi	1	Sg. Paloi	1
			Sg. Pontian Besar	7	Sg. Air Hitam	1
					Sg. Ayer Merah	1
					Sg. Pontian Besar	5
			Sg. Pontian Kecil	2	Sg. Pontian Kecil	2
			Sg. Pulai	3	Sg. Pulai	2
					Sg. Ulu Choh	1
			Sg. Rambah	2	Sg. Rambah	2
			Sg. Sanglang	1	Sg. Sanglang	1
			Sg. Sedili Besar	11	Sg. Ambat	1
					Sg. Dohol	1
					Sg. Mupur	1
					Sg. Pasir Panjang	1
					Sg. Sedili Besar	6
					Sg. Temubor Kanan	1
			Sg. Sedili Kecil	6	Sg. Anak Sedili Kecil	2
					Bahan	2
					Sg. Sedili Kecil	2
			Sg. Segget	5	Sg. Segget	5
			Sg. Skudai	11	Sg. Melana	2
					Sg. Skudai	9



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Tebrau	11	Sg. Bala	1
					Sg. Pandan	1
					Sg. Plentong	1
					Sg. Sebulung	1
					Sg. Sengkuang	1
					Sg. Tampoi	1
					Sg. Tebrau	5
Johor/ N.Sembilan/ Pahang	1	21	Sg. Muar	53	Sg. Air Panas	1
					Sg. Belemang	1
					Gemas	2
					Sg. Gemencheh	2
					Sg. Juasseh	3
					Sg. Kelamah	1
					Sg. Labis	3
					Sg. Meda	1
					Sg. Merbudu	1
					Sg. Merlimau	1
					Sg. Muar	24
					Sg. P.Mengkuang	1
					Sg. Pagoh	1
					Sg. Palong	2
					Sg. Pendol	1
					Sg. Sarang Buaya	1
					Sg. Segamat	3
					Sg. Senarut	1
					Sg. Serom	1
					Sg. Simpang Loi	1
					Sg. Tenang	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Kedah	2	20	Sg. Kedah	15	Sg. Changlun	1
					Sg. Janing	1
					Sg. Kedah	1
					Sg. Napoh	1
					Sg. Padang Terap	4
					Sg. Pedu	1
					Sg. Pendang	1
					Sg. Sintok	1
					Sg. Tekai	1
					Sg. Terusan Lengkuas	1
					Sg. Terusan Mada Selatan	1
					Sg. Terusan Tengah	1
			Sg. Merbok	11	Sg. Bakar Arang	1
					Sg. Batu	1
					Sg. Bongkok	1
					Sg. Bukit Nanas	1
					Sg. Bukit Merah	1
					Sg. Korok	1
					Sg. Merbok	1
					Sg. Petani	1
					Sg. Tok Pawang	2
					Sg. Tupah	1
Kedah (Langkawi)	3	6	Sg. Kisap	1	Sg. Kisap	1
			Sg. Kuah	1	Sg. Kuah	1
			Sg. Ulu Melaka	5	Sg. Chenang	1
					Sg. Melaka	2
					Sg. Petang	1
					Sg. Tuba	1



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Kedah/ P.Pinang	1	9	Sg. Muda	18	Sg. Chepir	1
					Sg. Gunung Inas	1
					Sg. Jerong	2
					Sg. Karangan	1
					Sg. Ketil	1
					Sg. Muda	7
					Sg. Pegang	1
					Sg. Sedim	1
					Sg. Tawar	3
Kelantan	5	35	Sg. Golok	7	Sg. Golok	4
					Sg. Jedok	1
					Sg. Lanas	1
					Sg. Tasik Garu	1
			Sg. Kelantan	56	Sg. Aring	1
					Sg. Belatop	3
					Sg. Ber	1
					Sg. Berok	3
					Sg. Betis	1
					Sg. Chiku	1
					Sg. Galas	5
					Sg. Isos	1
					Sg. Kelantan	6
					Sg. Kenkren	1
					Sg. Kerilla	2
					Sg. Kelesa	1
					Sg. Ketil	2
					Sg. Lebir	5
					Sg. Muring	1
					Sg. Nal	3
					Sg. Nenggiri	3
					Sg. Pehi	1
					Sg. Pelaur	1
					Sg. Penangau	1
					Sg. Pergau	8
					Sg. Rasau	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
					Sg. Relai	2
					Sg. Sokor	1
					Sg. Tuang	1
			Sg. Kemasin	6	Sg. Gali	1
					Sg. Kemasin	2
					Sg. Semerak	3
			Sg. Pengkalan Chepa	6	Sg. Alor B	1
					Sg. Alor Lintah	1
					Sg. Keladi	1
					Sg. Pengkalan Chepa	1
					Sg. Raja Gali	1
			Sg. Pengkalan Datu	4	Sg. Pasir Hor	1
					Sg. Pengkalan Datu	3
Melaka	4	11	Sg. Duyong	6	Sg. Duyong	3
					Sg. Gapam	1
					Sg. Punggur	2
			Sg. Kesang	8	Sg. Chin-Chin	2
					Sg. Tangkak	1
					Sg. Kesang	3
					Sg. Chohong	2
			Sg. Seri Melaka	3	Sg. Air Salak	1
					Sg. Seri Melaka	1
			Sg. Merlimau	5	Sg. Merlimau	5
Melaka/ Negeri Sembilan	1	9	Sg. Melaka	29	Sg. Batang Melaka	3
					Sg. Durian Tunggal	1
					Sg. Dusun Melaka	1
					Sg. Kemunting	1
					Sg. Malim	2



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
					Sg. Melaka	14
					Sg. Putat	2
					Sg. Rembia	2
					Sg. Tampin	3
N.Sembilan	1	1	Sg. Lukut	1	Sg. Lukut	1
N.Sembilan/ Melaka	2	22	Sg. Baru	1	Sg. Baru	1
			Sg. Linggi	35	Sg. Batang Penar	6
					Sg. Batu Hampar	1
					Sg. Chembong	1
					Sg. Empangan Terip	1
					Sg. Jelai Linggi	1
					Sg. Kayu Ara	1
					Sg. Kenaboi	1
					Sg. Kepayong	2
					Sg. Kundur Besar	1
					Sg. Linggi	6
					Sg. Muar	1
					Sg. Ngoi Ngoi	1
					Sg. Paroi	1
					Sg. Pedas	1
					Sg. Rembau	1
					Sg. Senawang	1
					Sg. Simin	1
					Sg. Simpang Ampat	1
					Sg. Siput	2
					Sg. Temiang	2
					Sg. Tuang	2

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
P.Pinang	5	24	Sg. Bayan Lepas	3	Sg. Bayan Lepas	1
					Sg. Tiram	2
			Sg. Jawi	7	Sg. Chempedak	1
					Sg. Jawi	1
					Sg. Junjong	3
					Sg. Machang Bubok	1
					Sg. Tengah	1
			Sg. Juru	12	Sg. Ara	1
					Sg. Juru	2
					Sg. Kilang Ubi	5
					Sg. Pasir	1
					Sg. Permatang Rawa	2
					Sg. Rambai	1
			Sg. Kluang	5	Sg. Ara	2
					Sg. Dua Besar	1
					Sg. Kluang	1
					Sg. Relau	1
			Sg. Pinang	17	Sg. Air Itam	3
					Sg. Air Terjun	1
					Sg. Batu Feringghi	2
					Sg. Dondang	6
					Sg. Jelutong	1
					Sg. Pinang	3
					Sg. Titi Kerawang	1



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
P.Pinang/ Kedah	1	9	Sg. Perai	23	Sg. Jarak	6
					Sg. Keladi	1
					Sg. Kereh	3
					Sg. Kubang Semang	1
					Sg. Kulim	5
					Sg. Perai	2
					Sg. Pertama	1
					Sg. Seluang	1
					Sg. Seluang Bawah	2
P.Pinang/ Kedah/Perak	1	6	Sg. Kerian	14	Sg. Kechil	2
					Sg. Kerian	6
					Sg. Selama	3
					Sg. Semang	1
					Sg. Serdang	1
					Sg. Terusan Bagan Serai	1
Pahang	8	29	Sg. Anak Endau	2	Sg. Anak Endau	2
			Sg. Balok	4	Sg. Balok	2
					Sg. Yior	1
					Sg. Panjang	1
			Sg. Bebar	5	Sg. Bebar	2
					Sg. Merba	1
					Sg. Serai	2
			Sg. Cherating	1	Sg. Cherating	1
			Sg. Kuantan	18	Sg. Belat	1
					Sg. Charu	1
					Sg. Galing Besar	2
					Sg. Kenau	1
					Sg. Kuantan	8
					Sg. Pandan	1
					Sg. Pinang	1
					Sg. Reman	1
					Sg. Riau	1
					Sg. Talam	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Merchong	2	Sg. Merchong	2
			Sg. Rompin	20	Sg. Aur	1
					Sg. Bakar	1
					Sg. Jekatih	2
					Sg. Jeram	1
					Sg. Kepasing	1
					Sg. Keratong	4
					Sg. Pontian	1
					Sg. Pukin	3
					Sg. Rompin	5
					Sg. Sepayang	1
			Sg. Tonggok	2	Sg. Tonggok	2
Pahang/ N.Sembilan	1	54	Sg. Pahang	134	Sg. Anak Sg. Lepar	1
					Sg. Batu	1
					Sg. Belayar	1
					Sg. Bentong	6
					Sg. Benus	3
					Sg. Bera	5
					Sg. Berkelah	1
					Sg. Bertam	3
					Sg. Bilut	2
					Sg. Burung	1
					Sg. Chini	1
					Sg. Habu	1
					Sg. Jelai	3
					Sg. Jempol	2
					Sg. Jengka	2
					Sg. Kecau	3
					Sg. Kelau	4
					Sg. Kertam	1
					Sg. Koyan	1
					Sg. Krau	1
					Sg. Kundang	1



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
					Sg. Lenggok	1
					Sg. Lepar	1
					Sg. Lipis	3
					Sg. Luit	1
					Sg. Maran	1
					Sg. Mentiga	2
					Sg. Pahang	27
					Sg. Penjuring	1
					Sg. Pertang	2
					Sg. Perting	1
					Sg. Raub	1
					Sg. Retang	1
					Sg. Ringlet	1
					Sg. Salak	1
					Sg. Semantan	4
					Sg. Serting	5
					Sg. T. Paya Bungor	1
					Sg. Tahan	1
					Sg. Tanglir	5
					Sg. Tasik Bera	1
					Sg. Tasik Chini	10
					Sg. Teh	1
					Sg. Tekal	1
					Sg. Telang	1
					Sg. Telemong	3
					Sg. Telom	2
					Sg. Tembeling	1
					Sg. Teranum	1
					Sg. Teras	2
					Sg. Teris	3
					Sg. Terla	1
					Sg. Triang	2
					Sg. Tringkap	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Perak	6	28	Sg. Bruas	7	Sg. Bruas	3
					Sg. Dandang	1
					Sg. Licin	1
					Sg. Rotan	2
			Sg. Kurau	6	Sg. Ara	2
					Sg. Kurau	4
			Sg. Perak	83	Sg. Batang Padang	3
					Sg. Behrang	1
					Sg. Berok	1
					Sg. Bidor	3
					Sg. Chenderiang	2
					Sg. Chepor	1
					Sg. Cuar	1
					Sg. Ibol	1
					Sg. Kampar	2
					Sg. Kangsar	3
					Sg. Kepayang	2
					Sg. Kerbau	2
					Sg. Kerdah	2
					Sg. Kinjang	1
					Sg. Kinta	9
					Sg. Klah	3
					Sg. Klian Baru	2
					Sg. Klian Gunong	1
					Sg. Kuang	1
					Sg. Nyamok	1
					Sg. Pari	2
					Sg. Pelus	2
					Sg. Perak	17
					Sg. Pinji	2
					Sg. Pulau	1
					Sg. Raia	2
					Sg. Rui	2



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
					Sg. Seluang	1
					Sg. Serokai	1
					Sg. Sintang	1
					Sg. Sungkai	4
					Sg. Sungkai Mati	2
					Sg. Tapah	1
					Sg. Teja	1
					Sg. Tumboh	1
			Sg. Raja Hitam	8	Sg. Manjong	2
					Sg. Derhaka	2
					Sg. Nyior	1
					Sg. Raja Hitam	3
			Sg. Sepetang	18	Sg. Batu Tegoh	4
					Sg. Jana	2
					Sg. Lidin	1
					Sg. Limau	1
					Sg. Malai	2
					Sg. Nyior	2
					Sg. Sepetang	2
					Sg. Temerloh	2
					Sg. Trong	2
			Sg. Wangi	4	Sg. Deralik	2
					Sg. Wangi	2
Perlis	1	11	Sg. Perlis	13	Sg. Arau	2
					Sg. Empangan Timah Tasoh	1
					Sg. Jarum	1
					Sg. Jernih	2
					Sg. Kok Mak	1
					Sg. Korok	1
					Sg. Ngulang	1
					Sg. Pelarit	1
					Sg. Perlis	1
					Sg. Serai	1
					Sg. Wang Kelian	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Sabah	36	68	Sg. Apas	1	Sg. Apas	1
			Sg. Balung	1	Sg. Balung	1
			Sg. Bengkoka	2	Sg. Bengkoka	2
			Sg. Bingkongan	6	Sg. Bandau	1
					Sg. Bingkongan	2
					Sg. Menggaris	2
					Sg. Tandek	1
			Sg. Bongawan	1	Sg. Bongawan	1
			Sg. Brantian	1	Sg. Brantian	1
			Sg. Kalabakan	3	Sg. Kalabakan	3
			Sg. Kalumpang	5	Sg. Kalumpang	3
					Sg. Pang Burong 1	1
					Sg. Pang Burong 2	1
			Sg. Kedamaian	4	Sg. Kedamaian	1
					Sg. Tempasuk	2
					Sg. Wariu	1
			Sg. Kimanis	1	Sg. Kimanis	1
			Sg. Kinabatangan	10	Sg. Karamuak	1
					Sg. Kinabatangan	4
					Sg. Koyah	1
					Sg. Leepang	1
					Sg. Menanggul	1
					Sg. Pin	1
					Sg. Takala	1
			Sg. Labok	7	Sg. Kinipir	2
					Sg. Labok	1
					Sg. Liwagu	2
					Sg. Maliau	1
					Sg. Tungud	1



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Lakutan	1	Sg. Lakutan	1
			Sg. Likas	8	Sg. Darau	1
					Sg. Inanam	3
					Sg. Likas	2
					Sg. Menggatal	2
			Sg. Lingkungan	2	Sg. Bukau	1
					Sg. Lingkungan	1
			Sg. Membakut	1	Sg. Membakut	1
			Sg. Menggalong	2	Sg. Menggalong	2
			Sg. Merotai	3	Sg. Merotai	3
			Sg. Mounad	2	Sg. Mounad	2
			Sg. Moyog	4	Sg. Moyog	4
			Sg. Padas	10	Sg. Bunsit	1
					Sg. Liawan	1
					Sg. Padas	3
					Sg. Pangatan	1
					Sg. Pegalan	3
					Sg. Tandulu	1
			Sg. Paitan	1	Sg. Paitan	1
			Sg. Papar	3	Sg. Papar	3
			Sg. Sapi	4	Sg. Sapi	3
					Sg. Sualong	1
			Sg. Segaliud	2	Sg. Segaliud	2
			Sg. Segama	3	Sg. Segama	3
			Sg. Sembulan	2	Sg. Sembulan	2
			Sg. Silabukan	2	Sg. Silabukan	2
			Sg. Sugut	6	Sg. Bongkud	1
					Sg. Lohan	1
					Sg. Merali	1
					Sg. Sugut	3
			Sg. Tawau	4	Sg. Tawau	4

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Telipok	2	Sg. Telipok	2
			Sg. Tenghilan	1	Sg. Tenghilan	1
			Sg. Tingkayu	2	Sg. Tingkayu	2
			Sg. Tuaran	5	Sg. Damit	2
					Sg. Song Sai	1
					Sg. Tuaran	2
			Sg. Tungku	2	Sg. Tungku	2
			Sg. Umas-Umas	1	Sg. Umas Umas	1
Sarawak	22	57	Sg. Balingian	2	Sg. Balingian	2
			Sg. Baram	5	Sg. Baram	4
					Sg. Tutuh	1
			Sg. Kayan	3	Sg. Kayan	3
			Sg. Kemena	5	Sg. Kemena	4
					Sg. Sibiu	1
			Sg. Kerian	3	Sg. Kerian	2
					Sg. Seblak	1
			Sg. Lawas	3	Sg. Lawas	3
			Sg. Limbang	5	Sg. Limbang	5
			Sg. Lupar	8	Sg. Ai	2
					Sg. Lupar	3
					Sg. Sekerang	1
					Sg. Seterap	1
					Sg. Undup	1
			Sg. Miri	7	Sg. Adong	1
					Sg. Dalam	1
					Sg. Lutong	2
					Sg. Miri	2
					Sg. Padang Liku	1
			Sg. Mukah	4	Sg. Mukah	4
			Sg. Niah	4	Sg. Niah	2
					Sg. Sekaloh	2
			Sg. Oya	3	Sg. Oya	3



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Rajang	19	Sg. Baloi	1
					Sg. Binatang	1
					Sg. Julau	1
					Sg. Kanowit	1
					Sg. Meradong	1
					Sg. Rajang	11
					Sg. Salim	1
					Sg. Sarikei	2
			Sg. Sadong	7	Sg. Karangan	2
					Sg. Sadong	4
					Sg. Tarat	1
			Sg. Sarawak	18	Sg. Kelantan	1
					Sg. Kuap	2
					Sg. Maong Kiri	1
					Sg. Samarahan	2
					Sg. Sarawak	6
					Sg. Sarawak Kanan	1
					Sg. Sarawak Kiri	1
					Sg. Semadang	1
					Sg. Semenggoh	1
					Sg. Tabuan	1
					Sg. Tapah	1
			Sg. Saribas	3	Sg. Layar	2
					Sg. Saribas	1
			Sg. Semunsam	1	Sg. Semunsam	1
			Sg. Sibuti	6	Sg. Kabuloh	2
					Sg. Kejapil	1
					Sg. Satap	1
					Sg. Sibuti	2
			Sg. Similajau	2	Sg. Similajau	2
			Sg. Suai	1	Sg. Suai	1
			Sg. Tatau	1	Sg. Tatau	1
			Sg. Trusan	1	Sg. Trusan	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Selangor	4	15	Sg. Buloh	6	Sg. Buloh	6
			Sg. Selangor	22	Sg. Air Hitam	2
					Sg. Batang Kali	1
					Sg. Guntong	1
					Sg. Kanching	1
					Sg. Kerling	1
					Sg. Kundang	1
					Sg. Rangkap	1
					Sg. Rawang	1
					Sg. Selangor	10
					Sg. Sembah	2
					Sg. Serendah	1
			Sg. Sepang	4	Sg. Rambai	1
					Sg. Sepang	3
			Sg. Tenggi	4	Sg. Tenggi	4
Selangor/ Perak	1	5	Sg. Bernam	15	Sg. Bernam	8
					Sg. Dusun	1
					Sg. Inki	1
					Sg. Slim	3
					Sg. Trolak	2
Selangor/ Putrajaya/ N.Sembilan	1	15	Sg. Langat	34	Sg. Anak Chuau	1
					Sg. Balak	1
					Sg. Batang Benar	1
					Sg. Batang Labu	7
					Sg. Batang Nilai	2
					Sg. Beranang	1
					Sg. Buan	1
					Sg. Chuau	2
					Sg. Jijan	1
					Sg. Langat	9
					Sg. Limau Manis	1



Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Selangor/ WPKL	1	20	Sg. Klang	57	Sg. Pajam	2
					Sg. Rinching	2
					Sg. Semenyih	2
					Sg. Sering	1
					Sg. Air Busuk	1
					Sg. Ampang	2
					Sg. Anak Air Batu	1
					Sg. Batu	5
					Sg. Belongkong	1
					Sg. Bunos	3
					Sg. Damansara	5
					Sg. Gombak	4
					Sg. Jinjang	4
					Sg. Kerayong	4
					Sg. Keroh	3
					Sg. Klang	13
					Sg. Kuyoh	2
					Sg. Penchala	3
					Sg. Pusu	1
					Sg. Rasau	1
					Sg. Rumpit	1
					Sg. Semelah	1
					Sg. Toba	1
					Sg. Untut	1
Terengganu	13	34	Sg. Besut	6	Sg. Besut	5
			Sg. Chukai	6	Sg. Jertih	1
					Sg. Bungkus	1
					Sg. Chukai	1
					Sg. Ibok	2
					Sg. Ruang	2
			Sg. Dungun	6	Sg. Dungun	5
					Sg. Telembuh	1
			Sg. Ibai	3	Sg. Ibai	3

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Lembangan Sungai River Basin	Jumlah Stesen Diawasi Total Station Monitored	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
			Sg. Kemaman	10	Sg. Cherul	3
					Sg. Kemaman	3
					Sg. Neram	1
					Sg. Perasing	1
					Sg. Ransan	2
			Sg. Kertih	2	Sg. Kertih	2
			Sg. Kluang	1	Sg. Kluang	1
			Sg. Marang	3	Sg. Kerak	1
					Sg. Marang	1
					Sg. Temala	1
			Sg. Merang	1	Sg. Merang	1
			Sg. Merchang	2	Sg. Landas	1
					Sg. Merchang	1
			Sg. Paka	8	Sg. Besul	1
					Sg. Paka	3
					Sg. Rasau	3
					Sg. Rengat	1
			Sg. Setiu	7	Sg. Bari	1
					Sg. Chalok	3
					Sg. Setiu	2
					Sg. Tarom	1
			Sg. Terengganu	14	Sg. Berang	2
					Sg. Nerus	6
					Sg. Pueh	2
					Sg. Telemong	1
					Sg. Terengganu	3



Jadual 4.5 : Senarai Stesen Pemantauan Muka Sauk Loji Rawatan Air
Table 4.5 : List of the Water Intake Monitoring Station

Negeri State	Lembangan Sungai River Basin	Kod WKA Code WQR	Sungai River	ID Stesen Station ID	Lokasi Muka Sauk Water Intake Location
Perlis	Perlis	01	Terusan Mada	2PS13	Muka sauks Loji Rawatan Air Arau Fasa IV
				2PS14	Muka sauks Loji Rawatan Air TTPC, Sg. Baru
Kedah	Melaka	01PLC	Sg. Melaka	2LG05	Ulu Melaka
			Sg. Saga	2LG06	Padang Saga
	Kedah	03	Sg. Temin	2KD10	Changloon
			Sg. Ahning	2KD11	Padang Sanai
			Sg. Padang Terap	2KD12	Kuala Nerang
	Muda	05	Sg. Muda	2MD16	Jeneri
				2MD17	Jeniang
				2MD18	Bukit Selambau
				2MD20	Pinang Tunggal
			Sg. Nami	2MD21	Nami
			Sg. Sedim	2MD19	Bikan
P.Pinang	Pinang	06PP	Sg. Satu	2PG12	Batu Feringgi
Perak	Kurau	9	Sg. Air Hitam	2KU07	Muka sauks Loji Rawatan Air Jelai
	Seputang	10	Sg. Batu Tegoh	2SP18	Muka sauks Loji Rawatan Air Bukit Larut
	Perak	13	Sg. Sauk	2PK61	Muka sauks Loji Rawatan Air Sauk
			Sg. Manong	2PK62	Muka sauks Loji Rawatan Air Manong
			Sg. Woh	2PK63	Muka sauks Loji Rawatan Air Kuala Woh
			Sg. Tesong	2PK64	Muka sauks Loji Rawatan Air Sg. Klah
Selangor/ Perak	Bernam		Sg. Trolak	2BM14	Muka sauks Loji Rawatan Air Trolak Timur
			Sg. Gelinting	2BM15	Muka sauks Loji Rawatan Air Ulu Slim
Selangor	Klang	18	Sg. Gombak	1K53	Muka sauks Loji Rawatan Air Gombak
	Langat	19	Sg. Semenyih	1L09	Muka sauks Loji Rawatan Air Semenyih
			Sg. Batang Labu	1L26	Muka sauks Loji Rawatan Air Salak Tinggi

Negeri State	Lembangan Sungai River Basin	Kod WKA Code WQR	Sungai River	ID Stesen Station ID	Lokasi Muka Sauk Water Intake Location	
Melaka	Kesang	24	Sg. Chin-Chin	1KA08	Muka sauik Loji Rawatan Air Chin-chin	
Johor	Muar	25	Sg. Jelai	1MN23	Muka sauik Loji Rawatan Air Dangi	
			Sg. Muar	3MR38	Muka sauik Loji Rawatan Air Gombang	
			Sg. Jementah	3MR39	Muka sauik Loji Rawatan Air Jementah	
	Batu Pahat	26	Sg. Semberong Dam	3BP27	Semberong Dam, Jalan Air Hitam-Kluang	
	Benut	27B	Sg. Machap Dam	3BN10	Machap Dam, Pekan Machap	
	Pulai	29D	Sg. Pulai Dam	3PU04	Pulai Dam, Pekan Ulu Choh, Kangkar Pulai	
	Endau	32	Sg. Kahang	3ED38	Jalan Felda Kahang Timur, Kluang	
Pahang	Bertam	35P	Sg. Terla	2CH14	Muka sauik Loji Rawatan Air Kuala Terla (WTSI)	
			Sg. Bertam	2CH15	Muka sauik Loji Rawatan Air Habu (WWB)	
			Sg. Ulong	2CH16	Brinchang Dam (WTBH)	
	Pahang		Sg. Triang	4PH93	Muka sauik Loji Rawatan Air Sg. Triang	
			Sg. Gapoi	4PH95	Muka sauik Loji Rawatan Air Gapoi	
			Sg. Jempol	4PH96	Jmbtn Sg Jempol Jln Ladang Getah Lubuk Yu ~ Loji Air Sg Jerik	
				4PH97	Jmbtn Sg Jempol Jln Bkt Tajau ~ Jengka 3 (Loji Air Jengka 3)	
			Sg. Mentiga	4PH98	Jmbtn Sg Metiga Jln Muadzam ~ Felda Chini (Loji Air Chini)	
Terengganu	Terengganu	43	Sg. Terengganu	4TE14	Kg Serada Up Stream Muka Loji Air Serada	



Negeri State	Lembangan Sungai River Basin	Kod WKA Code WQR	Sungai River	ID Stesen Station ID	Lokasi Muka Sauk Water Intake Location
Kelantan	Kelantan	48	Sg. Chiku	4KE66	Muka sauks Felda Ciku 2 (Syarikat Air Kelantan)
			Sg. Pahi	4KE67	Muka Sauk Loji Air Pahi (Syarikat Air Kelantan)
			Sg. Kelantan	4KE68	Muka Sauk Loji Air Kelar Pasir Mas (syarika Air Kelantan)
	Golok	49	Sg. Jeduk	4GL10	Jamb. Sg Jeduk Kg Bt Gajah Jln Tnh Merah ~ Jeli (Sykt Air Kelantan)
Sarawak	Kerian	55	Sg. Selalang	55SG01	Selalang Water Intake
	Rajang	56	Sg. Pakan	56PN01	Pakan Water Intake
			Sg. Daro	56DR01	Daro Water Intake
			Sg. Jemoreng	56JG01	Jemoreng Water Intake
			Sg. Pila Parit	56PL01	Igan Water Intake
	Mukah	58	Sg. Mukah	58MH05	Mukah Water Intake
Sabah	Padas	72	Sg. Padas	72PD04	Water Intake Jabatan Air Beaufort
	Papar	75	Sg. Papar	75PP04	Jambatan Sekolah Kebangsaan Mandalipau
				75PP05	Water Intake Kogopon, Jabatan Air Papar
JUMLAH TOTAL	54	25	49	55	

Jadual 4.6 : Parameter-Parameter Pengukuran Kualiti Air Sungai
Table 4.6 : River Water Quality Parameters

Parameter	Unit
Oksigen Terlarut / Dissolved Oxygen (DO)	mg/l, % saturated
Permintaan Oksigen Biokimia / Biological Oxygen Demand (BOD)	mg/l
Permintaan Oksigen Kimia / Chemical Oxygen Demand (COD)	mg/l
Pepejal Terampai / Suspended Solid (SS)	mg/l
pH	unit
Ammoniacal Nitrogen (NH ₃ -N)	mg/l
Suhu / Temperature	°C
Konduktiviti / Conductivity	µS
Kemiskinan / Salinity	ppt
Kekeruhan / Turbidity	NTU
Pepejal terlarut / Dissolved solids	mg/l
Pepejal / Total solids	mg/l
Nitrat / Nitrate (NO ₃)	mg/l
Klorida / Chloride (Cl)	mg/l
Fosfat / Phosphate (PO ₄)	mg/l
Arsenik / Arsenic (As)	mg/l
Merkuri / Mercury (Hg)	mg/l
Kadmium / Cadmium (Cd)	mg/l
Kromium / Chromium (Cr)	mg/l
Plumbum / Lead (Pb)	mg/l
Zink / Zinc (Zn)	mg/l
Kalsium / Calcium (Ca)	mg/l
Ferum / Ferum (Fe)	mg/l
Kalium / Potassium (K)	mg/l
Magnesium / Magnesium (Mg)	mg/l
Natrium / Sodium (Na)	mg/l
Minyak dan Gris / Oil and Grease (O&G)	mg/l
Methylene Blue Active Substances (MBAS)	mg/l
<i>E-coli</i>	cfu/100ml
Total Coliform	cfu/100ml





Pada tahun 2018, sejumlah 8,118 sampel air sungai telah diuji dan sebanyak 323,986 data telah dijana merangkumi kesemua parameter kualiti air yang diukur. Kualiti air sungai dinilai berdasarkan Indeks Kualiti Air (IKA) dan Standard Kualiti Air Kebangsaan (*National Water Quality Standard for Malaysia, NWQSM*). IKA ditentukan dengan mengambilkira enam parameter penunjuk pencemaran utama iaitu Oksigen Terlarut (DO), Keperluan Oksigen Biokimia (BOD), Keperluan Oksigen Kimia (COD), Ammonia Nitrogen (NH_3N), pH dan Pepejal Terampai (SS).

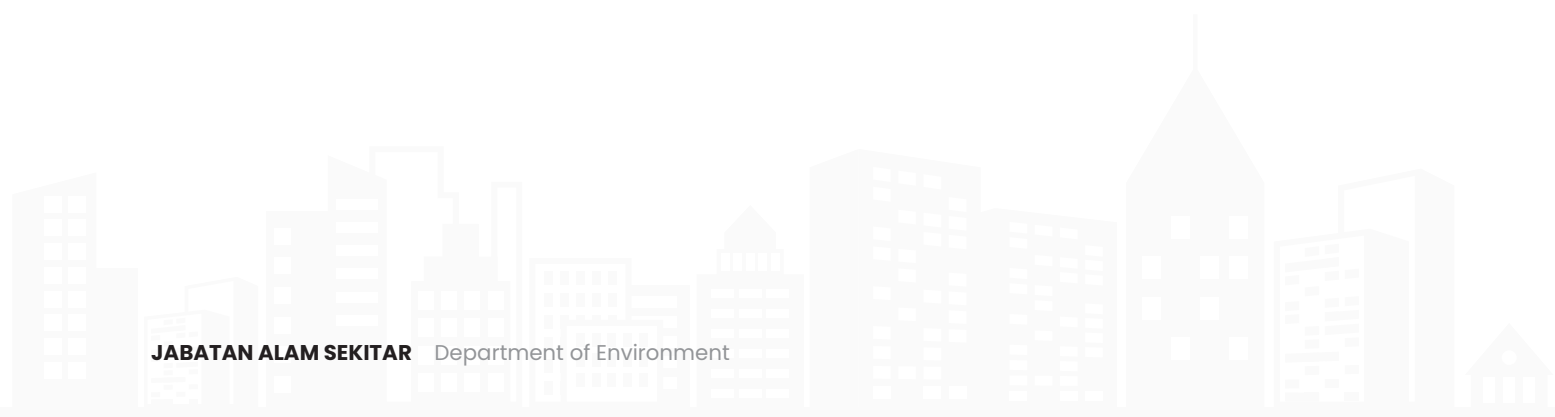
Pada tahun 2018, kualiti air sungai telah dinilai berdasarkan sejumlah 8,118 sampel air sungai yang telah diambil daripada sejumlah 1,353 stesen pengawasan manual yang merangkumi 638 sungai. Stesen-stesen tersebut adalah terdiri daripada 1,263 stesen ambien dan baseline, 55 stesen di hulu muka sauk terpilih, dan 35 stesen bagi projek *River of Life (RoL)*.

Jabatan Alam Sekitar masih memantau kualiti air sungai di bawah Program *River of Life (RoL)*. Objektif utama RoL adalah untuk membersihkan dan memperbaiki kualiti air di sepanjang 110 KM bahagian-bahagian Sungai Klang dan Sungai Gombak pada tahun 2020. JAS berperanan dalam melaporkan kualiti air sungai-sungai yang dipantau di dalam Lembangan Sungai Klang iaitu Sungai Klang, Sungai Gombak, Sungai Batu dan Sungai Jinjang. Senarai 35 stesen pemantauan bagi RoL adalah seperti di **Jadual 4.7**.

In 2018, a total of 8,118 river water samples were tested and a sum of 323,986 data was generated covering all of the water quality parameters. River water quality is appraised based on Water Quality Index (WQI) and National Water Quality Standard for Malaysia (NWQSM). The WQI is calculated by a formula which is derived for six principal parameters namely Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Ammoniacal Nitrogen ($\text{NH}_3\text{-N}$), Suspended Solids (SS) and pH.

In 2018, river water quality was assessed based on a total of 8,118 samples taken from a total of 1,353 manual monitoring stations covering 638 rivers. The stations comprised of 1,263 ambient and baseline stations, 55 stations located at upstream of selected water intakes, and 35 stations for River of Life (RoL) project.

The Department of Environment is still involved in the programme River of Life (RoL). The main objective of the RoL is to clean and improve water quality along 110 KM of the Klang and Gombak rivers in 2020. DOE's role is to report the Water Quality Regional, namely Sungai Klang, Sungai Gombak, Sungai Batu and Sungai Jinjang. The list of 35 monitoring stations in the RoL programed is as shown in **Table 4.7**.



Jadual 4.7 : Senarai Stesen Pemantauan Projek *River Of Life* (RoL)
Table 4.7 : List of the River of Life (RoL) Monitoring Station

Negeri State	Jumlah Sungai Diawasi Total River Monitored	Kod WKA Code WQR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Selangor/ WPKL	18	18	Klang	35	Sg. Batu	4
					Sg. Gombak	3
					Sg. Jinjang	3
					Sg. Klang	6
					Sg. Semelah	1
					Sg. Air Busuk	1
					Sg. Ampang	2
					Sg. Belongkong	1
					Sg. Bunos	3
					Sg. Kerayong	2
					Sg. Keroh	2
					Sg. Toba	1
					Sg. Untut	1
					Sg. Anak Air Batu	1
					Sg. Kuyoh	1
					Sg. Rasau	1
					Sg. Payong	1
					Sg. Penchala	1
JUMLAH TOTAL					18	35



Aktiviti yang berkaitan dengan pengawasan kualiti air sungai adalah seperti di **Jadual 4.8**.

Other activities attended by the DOE are shown in **Table 4.8**.

Jadual 4.8 : Program dan Aktiviti Program Pengawasan Kualiti Air Sungai
Table 4.8 : Programs and Activities Regarding to River Water Quality Monitoring Programme

TARIKH DATE	AKTIVITI DAN PROGRAM ACTIVITIES AND PROGRAMMES	TEMPAT VENUE
2 Januari 2018	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 1/2018	Kementerian Wilayah Persekutuan
31 Januari 2018	Mesyuarat Pasukan Petugas Khas (<i>Task Force</i>) Projek 'River Of Life' Untuk Skop Pembersihan Sungai Bil. 1/2018	Jabatan Pengairan dan Saliran, Malaysia
27 Februari 2018	Mesyuarat Pasukan Petugas Khas (<i>Task Force</i>) Projek 'River Of Life' Untuk Skop Pembersihan Sungai Bil. 2/2018	Jabatan Pengairan dan Saliran, Malaysia
22 Mac 2018	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 2/2018	Kementerian Wilayah Persekutuan
3-Apr-18	Mesyuarat Pasukan Petugas Khas (<i>Task Force</i>) Projek 'River Of Life' Untuk Skop Pembersihan Sungai Bil. 3/2018	Jabatan Pengairan dan Saliran, Malaysia
24-Apr-18	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 3/2018	Kementerian Wilayah Persekutuan
15 Mei 2018	"Mesyuarat Dan Bengkel Perundangan Berkaitan Pengurusan Sumber Air Di Bawah Projek Rmk-11: Kajian Pembangunan Dan Penggunaan <i>Total Maximum Daily Load (TMDL)</i> Bagi Kumpulan Kerja 4 : Kualiti Dan Standard, Dasar Sumber Air Negara (Dsan) Bil. 1/2018"	Jabatan Alam Sekitar Malaysia
16 Mei 2018	Mesyuarat Jawatankuasa Peneraju Kumpulan Kerja Dasar Sumber Air Negara (JPKKDSAN)	Jabatan Pengairan Dan Saliran Malaysia
18 Mei 2018	Mesyuarat Jawatankuasa Pasukan Petugas Dasar Sumber Air Negara (PPDSAN)	Jabatan Pengairan Dan Saliran Malaysia
7-Jun-18	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 4/2018	Kementerian Wilayah Persekutuan

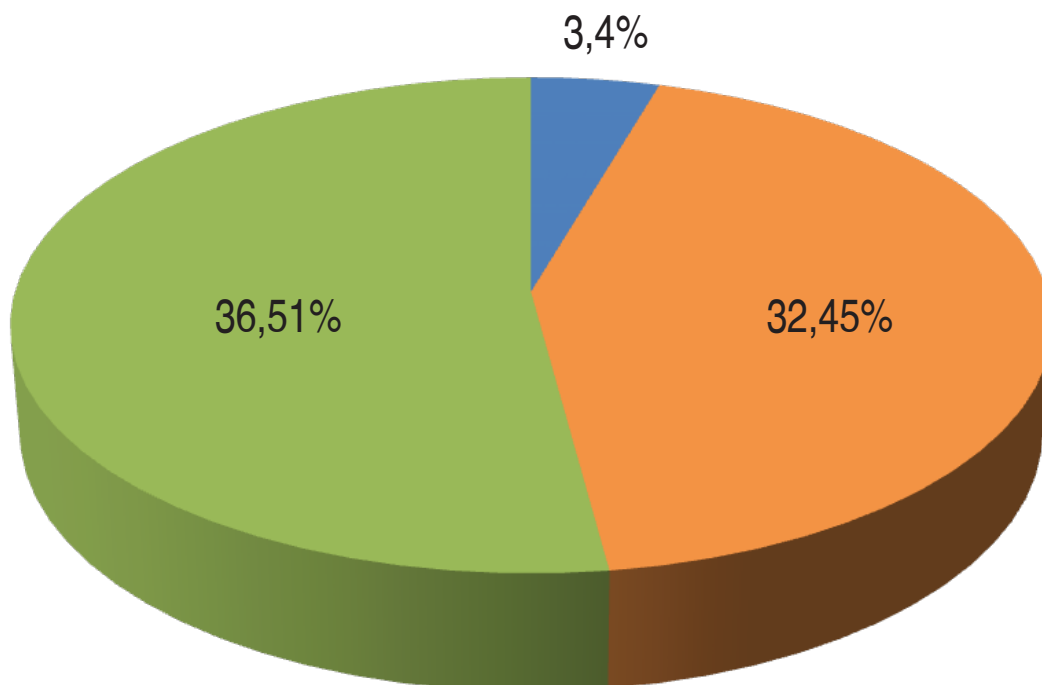
TARIKH DATE	AKTIVITI DAN PROGRAM ACTIVITIES AND PROGRAMMES	TEMPAT VENUE
7-Jun-18	Mesyuarat Pasukan Petugas Khas (<i>Task Force</i>) Projek ' <i>River Of Life</i> ' Untuk Skop Pembersihan Sungai Bil. 4/2018	Jabatan Pengairan Dan Saliran Malaysia
30-Jul-18	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 5/2018	Kementerian Wilayah Persekutuan
6-Sep-18	Mesyuarat Dan Bengkel Penyediaan Terma Rujukan Kajian Dasar Air Negara	Nilai Spring Resort
7-Sep-18	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 6/2018	Kementerian Wilayah Persekutuan
14-Sep-18	Mesyuarat Pasukan Petugas Khas (<i>Task Force</i>) Projek ' <i>River Of Life</i> ' Untuk Skop Pembersihan Sungai Bil. 5/2018	Jabatan Pengairan Dan Saliran Malaysia
2-Oct-18	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 7/2018	Kementerian Wilayah Persekutuan
16-Oct-18	Mesyuarat Pasukan Petugas Khas (<i>Task Force</i>) Projek ' <i>River Of Life</i> ' Untuk Skop Pembersihan Sungai Bil. 6/2018	Jabatan Pengairan Dan Saliran Malaysia
18 Oktober 2018	Taklimat Teknologi Polymer Block (Anjuran Bersama Eimas)	Institut Alam Sekitar Malaysia
30 – 31 Oktober 2018	"Mesyuarat Dan Bengkel Perundangan Berkaitan Pengurusan Sumber Air Di Bawah Projek Rmk-II : Kajian Pembangunan Dan Penggunaan <i>Total Maximum Daily Load (TMDL)</i> Bagi Kumpulan Kerja 4 : Kualiti Dan Standard, Dasar Sumber Air Negara (DSAN)"	Jabatan Alam Sekitar Malaysia
21 November 2018	Mesyuarat Penyediaan Terma Rujukan Kajian Dasar Air Negara	Kementerian Air, Tanah dan Sumber Asli
23-Nov-18	Mesyuarat Jawatankuasa Penyelarasan Dan Pelaksanaan (<i>Coordination And Implementation Committee, CIC</i>) Projek-Projek Di Bawah Greater Kuala Lumpur/Klang Valley (GKL/KV) Bil. 8/2018	Kementerian Wilayah Persekutuan
28-29 November 2018	Mesyuarat Penyediaan Terma Rujukan Kajian Dasar Air Negara	Kementerian Air, Tanah dan Sumber Asli
12 Disember 2018	Mesyuarat Pasukan Petugas Khas (<i>Task Force</i>) Projek ' <i>River Of Life</i> ' Untuk Skop Pembersihan Sungai Bil. 7/2018	Jabatan Pengairan Dan Saliran Malaysia



■ Perundangan Swasta yang Dilantik Oleh Kerajaan

■ Agensi-Agensi atau Jabatan Kerajaan

■ Penuntut dan Pensyarah IPTA dan IPTS, Pelajar Malaysia di Universiti/Kolej Luar Negara



Rajah 4.1 : Bilangan permohonan data kualiti air sungai yang diterima oleh JAS
Figure 4.1 : Number of application for water quality data received by DOE



PENGAWASAN KUALITI AIR TANAH

Program Pengawasan Kualiti Air Tanah Kebangsaan telah dimulakan pada tahun 1997 di Semenanjung Malaysia dan diperkembangkan ke Sabah dan Sarawak pada tahun 2003. Sehingga kini terdapat 119 stesen pengawasan kualiti air tanah di seluruh Malaysia. (14) stesen pengawasan terletak di Sabah, (12) di Sarawak dan selebihnya di Semenanjung Malaysia.

Pengukuran parameter-parameter dijalankan secara insitu dan analisa makmal. **Jadual 4.9** menunjukkan parameter yang dianalisa secara insitu dan analisa di makmal.

Peralatan yang digunakan semasa persampelan air tanah termasuklah pam 'hydro lift', tiub HDPE, alat ukur kedalaman air, generator, botol persampelan/alat ujian - larutan pengawetan, kotak kedap ais dan *multiprob*.

GROUNDWATER QUALITY MONITORING

Groundwater quality monitoring was established in 1997 for Peninsular Malaysia and extended to cover Sabah and Sarawak in 2003. Until now, there are 119 groundwater monitoring stations throughout Malaysia. (14) monitoring stations are located in Sabah, (12) in Sarawak and the rest in Peninsular Malaysia

Measurement of parameters is carried out in in-situ and laboratory analysis. **Table 4.9** shows parameters which is analyzed in-situ and laboratory.

The equipments that is used in groundwater sampling are hydro lift pump, HDPE tubing, water depth sensor, generator, sampling bottle/preservative kit, coolbox and multiprobe.

Jadual 4.9 : Kaedah Analisa dan Parameter
Table 4.9 : Analysis Method And Parameter

KAEDAH ANALISA ANALYSIS METHOD	PARAMETER	GAMBARAN PICTURE
<i>In-Situ</i> Insitu	Suhu/Temperature pH Konduktiviti/Conductivity Kekeruhan/Turbidity Kemasinan/Salinity Oksigen Terlarut/Dissolved Oxygen	
Makmal Lab	Sebatian Organik Meruap (VOC) Volatile Organic Compounds (VOCs) Hidrokarbon/Hydrocarbons Racun Perosak/Pesticides Logam Berat/Heavy Metal Anion/Anions Koliform/Total Coliform Sebatian Berfenol/Phenolic Compounds Radioaktif/Radioactivity Jumlah Keliatan/Total Hardness Jumlah Pepejal Terlarut/Total Dissolved Solids	

PROJEK-PROJEK YANG DIJALANKAN DI BAWAH RANCANGAN MALAYSIA KE 11 (RMK 11) – TAHUN 2018

Pada tahun 2018 Jabatan Alam Sekitar telah menjalankan projek sambungan tahun 2017 di bawah RMK 11. Projek tersebut adalah seperti berikut :-

Rangkaian Stesen Pengawasan Air Tanah Kebangsaan Di Malaysia

Projek telah bermula pada tahun 2017 dan telah berakhir pada tahun 2018. Program ini bertujuan meningkatkan rangkaian pengawasan air tanah yang lebih praktikal ke arah mendapatkan kualiti air tanah yang komprehensif dan menyeluruh. Disamping itu, ianya juga akan meningkatkan tahap dan kemampuan kualiti hidup rakyat melalui langkah-langkah proaktif di dalam pengawalan punca-punca yang menyebabkan pencemaran air tanah melalui pelaporan status kualiti air tanah yang tepat. Melalui projek ini sebanyak sepuluh (10) stesen pengawasan tambahan telah dibina di Semenanjung Malaysia. Senarai sepuluh (10) stesen pengawasan kualiti air tanah adalah sebagaimana **Jadual 4.10**.

PROJECT UNDER THE 11th MALAYSIAN PLAN

In year 2018, The Department of Environment has conducted project under the 11th Malaysian Plan. The project is as follow :-

Groundwater Monitoring Station Network In Malaysia

The project was started in the year 2017 and has been completely built in year 2018. The objective of the project is to enhance more practical groundwater monitoring network to achieve a comprehensive quality of groundwater. In addition, it will also increase the level and capability of the people's livelihood through proactive measures in the control of the cause of pollution ground water through proper groundwater quality reporting. Through this project, an additional ten (10) monitoring stations has been built in Peninsular Malaysia. The list of ten (10) groundwater quality monitoring stations is as shown in **Table 4.10**.

Jadual 4.10 : Stesen Pengawasan Kualiti Air Tanah dibina di bawah Projek RMK 11
Table 4.10 : Groundwater Quality Monitoring Station built under the 11th MP Project

NEGERI STATE	PREMIS PREMISES	ALAMAT ADDRESS	GUNATANAH LANDUSE
Kedah	Sekolah Kebangsaan Kepala Batas	Mukim Bukit Tinggi, Daerah Kubang Pasu	Bandar/Pinggir Bandar Urban/Suburban
	Tapak Pejabat Dan Rumah Pegawai Imigresen	Lot 1384, Mukim Ayer Hangat, Langkawi	Pelancongan Tourism
Melaka	Tapak Pelupusan Sampah Sungai Udang	Tapak Pelupusan Sanitari Sungai Udang 76300 Melaka	Tapak Pelupusan Sampah Sanitary Landfill
	Sekolah Kebangsaan Bari Pantai	Lot 2881, Mukim Chalok, Daerah Setiu	Perindustrian Industry
Terengganu	Sekolah Kebangsaan Telaga	Lot 4664, Mukim Kuala Berang, Daerah Hulu Terengganu	Pertanian Agriculture
Pahang	Lynas (M) Sdn Bhd	Pt 17212, Jalan Gebeng 3, Kawasan Perindustrian Gebeng, Mukim Sg Karang, Kuantan	Perindustrian Industry
Johor	Tapak Pelupusan Sanitari Sisa Pepejal Ladang Cep	Sebhg. Lot 2075, Mukim Renggam, Daerah Kluang	Tapak Pelupusan Sampah Sanitary Landfill
Negeri Sembilan	Tapak Pelupusan Sampah Tanah Merah	Lot 7212, Mukim Jimah, Daerah Port Dickson	Tapak Pelupusan Sampah Sanitary Landfill
Kelantan	Sekolah Menengah Cherang Ruku	Pekan Cherang Ruku, 16700 Cherang Ruku	Luar Bandar Rural
Perlis	Pembangunan Lembah Chuping	Mukim Titi Tinggi, Perlis	Perindustrian Industry





BENGKEL DI BAWAH PROJEK RMK-11 BAGI PROJEK-PROJEK STESEN PENGAWASAN KUALITI AIR TANAH KEBANGSAAN

Bengkel-bengkel yang telah dijalankan di bawah projek RMK-11 bagi projek-projek Stesen Pengawasan Kualiti Air Tanah adalah seperti di bawah :-

1) Bengkel Pemantapan Program Pengawasan Kualiti Air Tanah Kebangsaan 2018 di bawah Projek RMK 11

Bengkel ini telah dijalankan pada 2 hingga 6 September 2018 di Primula Beach Hotel, Kuala Terengganu. Objektif Bengkel adalah:-

- i. Menerangkan objektif penambahan dan pembinaan Stesen Pengawasan Air Tanah Kebangsaan dengan Jabatan Alam Sekitar Negeri di bawah Projek Rancangan Malaysia Ke-11 (RMK11), dan kronologi pembinaan stesen ini serta skop dan spesifikasi perkhidmatan pihak kontraktor yang telah dilantik kepada Jabatan Alam Sekitar
- ii. Melatih pegawai JAS membuat persampelan pengawasan air tanah dan memberikan penelitian yang khusus kepada pelaksanaan konsep Jaminan Kualiti (QA) dan Kawalan Kualiti (QC) Program Pengawasan Air Tanah ; dan
- iii. Melaksanakan program pengawasan air tanah mengikut protokol pengawasan yang diamalkan diperingkat serantau dan antarabangsa

WORKSHOP UNDER THE PROJECTS OF 11th MALAYSIAN PLAN FOR NATIONAL GROUNDWATER MONITORING STATION

Workshop under the 11th Malaysian Plan for National Groundwater Monitoring Station projects was held as below :-

1) Workshop on Enhancement of the National Groundwater Monitoring Program 2018 under the 11th Malaysian Plan

Workshop was held on 2nd until 6th September 2018 at Primula Beach Hotel, Kuala Terengganu. The objectives of the Workshop are: -

- i. To explain the objectives of National Groundwater Monitoring Project under the 11th Malaysia Planning Project to state DOE and the chronology of the construction of the stations including the scope and specifications services by the contractor that has been appointed by the Department of Environment
- ii. Train the Department of Environment (DOE) officers to perform ground water monitoring sampling and provide specific research on the implementation of the Groundwater Surveillance Program Quality Control (QA) Quality Control (QC) concept; and
- iii. Implementation of groundwater monitoring programs in accordance with monitoring protocols adopted at regional and international levels

Bengkel ini dikendalikan oleh Bahagian Air Dan Marin dan RBI Cosultant. RBI Consultant merupakan jururunding dan kontraktor bagi projek RMK 11.

Peserta Bengkel terdiri dari pegawai-pegawai dari Jabatan Alam Sekitar Negeri dan Ibu Pejabat.

2) Pembentangan Draf Laporan Akhir dan Bengkel Projek Penambahan Rangkaian Stesen Pengawasan Air Tanah Kebangsaan di Malaysia Dan Bengkel Penggubalan Modul Pengawasan Air Tanah.

Bengkel ini telah dijalankan pada 24 hingga 25 Oktober 2018 di RHR Hotel, Bangi, Selangor. Objektif Bengkel adalah:-

- i. Menilai Draf Laporan Akhir Projek Penambahan Rangkaian Stesen Pengawasan Air Tanah Kebangsaan Di Bawah Rancangan Malaysia Ke 11 (RMK 11);
- ii. Merangka dan menggubal Modul Pengawasan Kualiti Air Tanah bagi pegawai-pegawai Jabatan Alam Sekitar; dan
- iii. Perkongsian pengalaman dan peranan agensi-agensi kerajaan dan pihak swasta berkaitan

Bengkel ini dikendalikan oleh Seksyen Pengawasan Air Tanah dan Bahagian Air Dan Marin. Peserta Bengkel terdiri dari pegawai Jabatan Alam Sekitar Negeri dan Ibu Pejabat.

The workshop was conducted by Water And Marine Division and RBI Consultant. RBI Consultant is a consultant and contractor for the 11th Malaysian Plan project.

The Workshop participants are Department of Environment (DOE) Officers (DOEs) from states and headquarters.

2) Presentation on Draft Final Report and Workshop for Project Network for Groundwater Monitoring Stations in Malaysia

Workshop was held on 24th until 25th Oktober 2018 at RHR @ Uniten Hotel in Bangi, Selangor. The objectives of the workshop:

- i Evaluating the Final Report of the Project Network for Groundwater Monitoring Stations in Malaysia Under The 11th Malaysia Plan (RMK 11);
- ii. Draft and formulate the Groundwater Quality Monitoring Module for the officers of Department of Environment references; and
- iii. Sharing experiences and the roles of government agencies and private sector related to environment.

The workshop was conducted by Water and Marine Division. Participants are Department of Environment (DOE) Officers (DOEs) from states and headquarters.





Bengkel Pemantapan Program Pengawasan Kualiti Air Tanah Kebangsaan 2018 di bawah Projek Rancangan Malaysia Ke 11
Workshop on Enhancement of the National Groundwater Monitoring Program 2018 under the 11th Malaysia Plan



Lawatan Peserta Bengkel ke Stesen Air Tanah
Workshop Participants Visit Groundwater Station



Pembentangan Draf Laporan Akhir Projek Penambahan Rangkaian Stesen Pengawasan Air Tanah Kebangsaan Di Malaysia Dan Bengkel Penggubalan Modul Pengawasan Air Tanah
Presentation of Draft Final Report And Workshop Project Network Of Groundwater Monitoring Station In Malaysia

RANCANGAN KONTINGENSI KEBANGSAAN KAWALAN TUMPAHAN MINYAK

Rancangan Kontingensi Kebangsaan Kawalan Tumpahan Minyak (RKKKTM) merupakan pelan kontingensi yang menyediakan garis panduan bagi menghadapi kejadian tumpahan minyak yang berlaku di perairan Malaysia. RKKKTM ditadbir oleh Jawatankuasa Kebangsaan Kawalan Tumpahan Minyak (JKKTM) yang dianggotai oleh tujuh belas (17) Jabatan dan agensi. Jawatankuasa ini dipengerusikan oleh Ketua Pengarah Jabatan Alam Sekitar Malaysia. Kesiapsiagaan kawalan tumpahan minyak adalah melalui penempatan peralatan mengawal tumpahan minyak yang ditempatkan di lokasi-lokasi strategik seperti **Peta 4.2**. Jabatan Alam Sekitar (JAS) juga memberi penekanan terhadap latihan-latihan berstruktur dan berkala bagi semua kakitangan yang terlibat dalam tindakbalas tumpahan minyak. Latihan-latihan berkenaan adalah bagi memastikan semua kakitangan JAS dan agensi-agensi yang akan terlibat dalam tindakbalas tumpahan minyak dibekalkan dengan pengetahuan dan kemahiran yang mencukupi dalam pengendalian peralatan dan pengurusan krisis. Resolusi 6 di dalam International Convention on Oil Spill Preparedness and Response (OPRC) 1990 telah menggariskan obligasi negara terhadap komitmen di peringkat antarabangsa berhubung hal-ehwal berhubung dengan latihan. Keperluan latihan ini telah dimasukkan ke dalam mekanisme tindakbalas RKKKTM dan dilaksanakan secara berterusan.

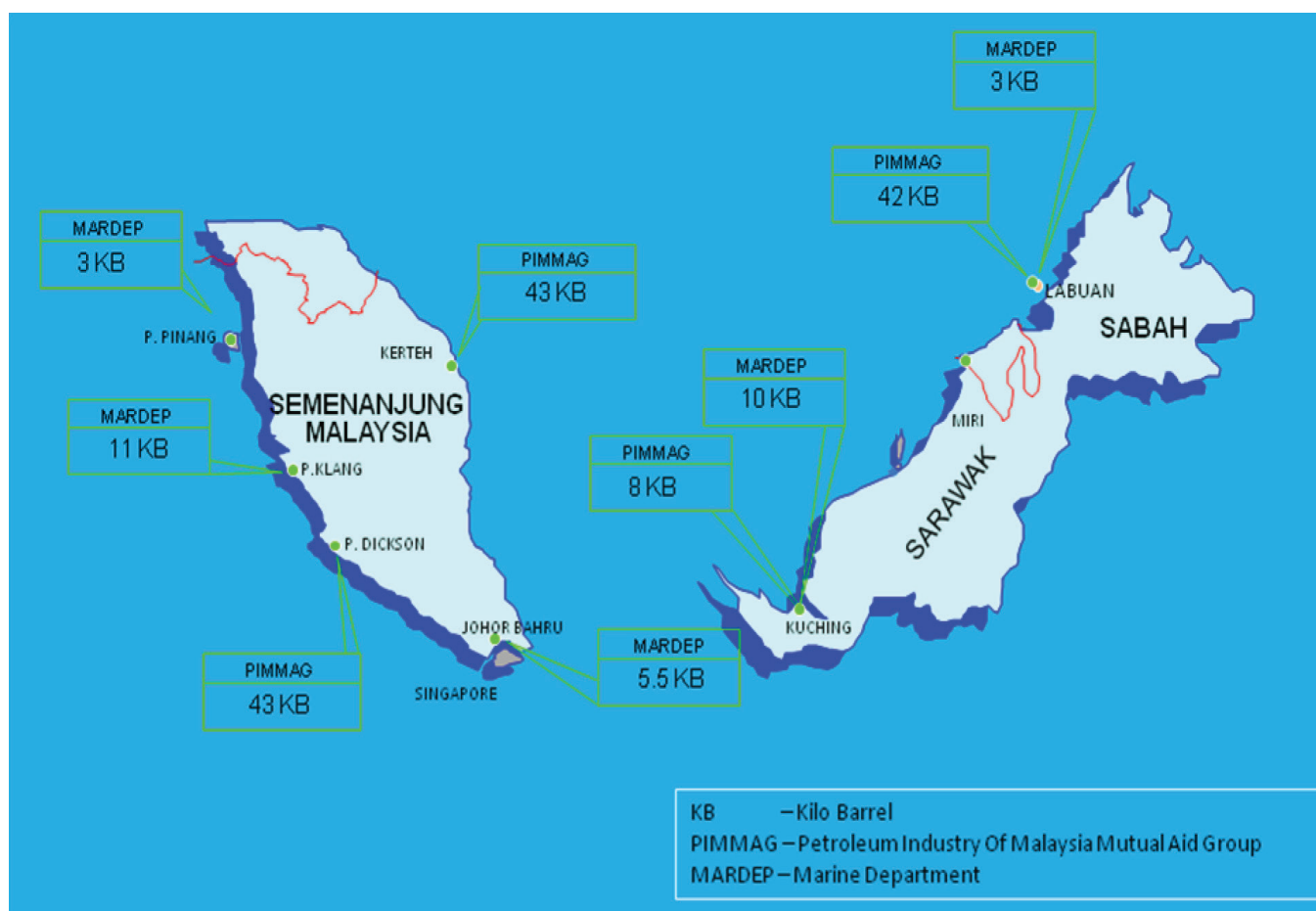
NATIONAL OIL SPILL CONTINGENCY PLAN

The National Oil Spill Contingency Plan (NOSCP) is a contingency plan which provides guidelines to address oil spill incident in Malaysian waters. The NOSCP is administered by the National Oil Spill Control Committee (NOSCC) consisting of seventeen (17) member departments and agencies. The committee is chaired by the Director General of Department of Environment Malaysia (DOE). Oil spill control preparedness is executed by positioning the Oil Spill Response Equipment (OSRE) at strategic locations as shown in **Map 4.2**. DOE places equal emphasis on scheduled and periodical training activities for personnel involved in oil spill response. Such training is aimed to ensure DOE officers involved in oil spill response are well equipped with necessary knowledge and skills in equipment handling and crisis management. Resolution 6 of the International Convention on Oil Spill Preparedness and Response (OPRC) 1990 provides a Country obligation for an International Commitment to training and preparedness. This preparedness and training requirement has been incorporated into NOSCP response system and continuously implemented.



Di sepanjang tahun 2018, sebanyak 13 aktiviti berkaitan dengan Kawalan tumpahan minyak telah dianjurkan/dihadiri/dilaksanakan oleh pegawai-pegawai JAS bagi tujuan peningkatan kemahiran dan perkongsian kepakaran dalam bidang ini. Antara aktiviti yang telah dilaksanakan adalah seperti **Jadual 4.11**.

Throughout 2018, a total of 13 activities related to oil spill were organized/attended/conducted by DOE officers for capacity building and sharing of expertise in this field. The activities is shown in **Table 4.11**.



Peta 4.2 : Lokasi Peralatan Melawan Tumpahan Minyak Dan Keupayaan Di Malaysia, 2018.
Map 4.2 : Location Of Oil Spill Equipment Stockpile And Capability In Malaysia, 2018.

Jadual 4.11 : Aktiviti Kawalan Tumpahan Minyak 2018
Table 4.11 : Oil Spill Activities 2018

BIL NO	AKTIVITI ACTIVITIES	TARIKH DATES
1	Program Verifikasi Pelan Tindakbalas Kawalan Tumpahan Minyak Tier 1 di Pelabuhan Kerteh Tier 1 Oil Spill Response Plan Verification Program in Kerteh Port	5 Februari 5 February 2018
2	Program Verifikasi Pelan Tindakbalas Kawalan Tumpahan Minyak Tier 1 di Pelabuhan Kemaman Tier 1 Oil Spill Response Plan Verification Program in Kemaman Port	7 Februari 7 February 2018
3	Program Verifikasi Pelan Tindakbalas Kawalan Tumpahan Minyak Tier 1 di Pelabuhan Kuantan Tier 1 Oil Spill Response Plan Verification Program in Kuantan Port	8 Februari 8 February 2018
4	Majlis Menandatangani Memorandum Persefahaman Kerjasama Dalam Membangunkan Pangkalan Data Cetak-Jari Hidrokarbon Antara Kerajaan Malaysia dan PETRONAS Memorandum of Understanding Signing Ceremony Between Government of Malaysia and PETRONAS in Developing Hydrocarbon Fingerprinting	21 Februari 21 February 2018
5	Bengkel User Acceptance Test (UAT) untuk Pegawai-Pegawai Jabatan Alam Sekitar di EIMAS User Acceptance Test (UAT) Workshop for Department of Environment Officers at EIMAS	1 hingga 3 Ogos 1 to 3 August 2018
6	Bengkel Pengoperasian dan Penggunaan Dispersant oleh Negara-negara Berpantai dan Bengkel Meningkatkan Kesedaran Berkenaan Dispersant di Selat Melaka dan Singapura The Regional Workshop on the Dispersant Usage and Operation by the Littoral States and Workshop on Enhancing Awareness on Dispersant in the Straits of Malacca and Singapore	13 hingga 15 Ogos 13 to 15 August 2018
7	Mesyuarat Teknikal Revolving Fund Committee (RFC) Revolving Fund Committee Technical Meeting (RFC)	15 hingga 17 Ogos 15 to 17 August 2018
8	Bengkel Final Acceptance Test (FAT) Bagi Sistem Hydrocarbon Fingerprinting kepada PETRONAS di Menara Berkembar KLCC PETRONAS Final Acceptance Test on Hydrocarbon Fingerprinting Workshop for PETRONAS at PETRONAS KLCC Twin Tower	14 September 14 September 2018
9	Bengkel Final Acceptance Test (FAT) bagi Sistem Hydrocarbon Fingerprinting kepada Jabatan Kimia Malaysia di Bahagian ICT JAS Putrajaya Final Acceptance Test (FAT) on Hydrocarbon Fingerprinting System Workshop for Department of Chemistry at ICT Division DOE Putrajaya	19 hingga 20 September 19 to 20 September 2018
10	Bengkel Final Acceptance Test (FAT) Sistem Hydrocarbon Fingerprinting kepada Pegawai Jabatan Alam Sekitar di Bahagian ICT JAS Putrajaya Final Acceptance Test (FAT) on Hydrocarbon Fingerprinting System Workshop for Department of Environment Officers at ICT Division DOE Putrajaya	19 hingga 20 September 19 to 20 September 2018
11	Bengkel Final Acceptance Test (FAT) Sesi Kedua Bagi Sistem Hydrocarbon Fingerprinting kepada Pegawai Jabatan Alam Sekitar di EIMAS Second Session of Final Acceptance Test (FAT) on Hydrocarbon Fingerprinting System Workshop to Department of Environment Officers at EIMAS	19 hingga 20 September 19 to 20 September 2018
12	Mesyuarat Jawatankuasa Induk ke-37 Revolving Fund Committee (RFC) 37 th Meeting of the Revolving Fund Committee	14 hingga 16 November 14 to 16 November 2018





Program Verifikasi Pelan Tindakbalas Kawalan Tumpahan Minyak Tier 1 di Pelabuhan Kerteh, Terengganu pada 5 Februari 2018.

Tier 1 Oil Spill Response Plan Verification Program in Kerteh Port, Terengganu on 5 February 2018.



Program Verifikasi Pelan Tindakbalas Kawalan Tumpahan Minyak Tier 1 di Pelabuhan Kemaman, Terengganu pada 7 Februari 2018.

Tier 1 Oil Spill Response Plan Verification Program in Kemaman Port on 7 February 2018.



Program Verifikasi Pelan Tindakbalas Kawalan Tumpahan Minyak Tier 1 di Pelabuhan Kuantan, Pahang pada 8 Februari 2018.

Tier 1 Oil Spill Response Plan Verification Program in Kuantan Port, Pahang on 8 February 2018.



Majlis Menandatangani Memorandum Persefahaman Kerjasama Dalam Membangunkan Pangkalan Data Cetak-Jari Hidrokarbon Antara Kerajaan Malaysia dan Petronas pada 21 Februari 2018.

Memorandum of Understanding Signing Ceremony Between Government of Malaysia and PETRONAS in Developing Hydrocarbon Fingerprinting on 21st February 2018.





Bengkel *Final Acceptance Test (FAT)* Bagi Sistem *Hydrocarbon Fingerprinting* kepada PETRONAS di Menara Berkembar KLCC PETRONAS pada 14 September 2018.
Final Acceptance Test on Hydrocarbon Fingerprinting System Workshop for PETRONAS at PETRONAS KLCC Twin Tower on 14 September 2018.



Bengkel *Final Acceptance Test (FAT)* bagi Sistem *Hydrocarbon Fingerprinting* kepada Jabatan Kimia Malaysia di Bahagian ICT JAS Putrajaya pada 19 dan 20 September 2018.
Final Acceptance Test (FAT) on Hydrocarbon Fingerprinting System Workshop for Department of Chemistry at ICT Division DOE Putrajaya from 19 to 20 September 2018.

JAWATANKUASA TABUNG PUSINGAN BAGI SELAT MELAKA DAN SELAT SINGAPURA (RFC)

Tabung RFC ini telah ditubuhkan pada 11 Februari 1981 bagi tujuan kegunaan dalam melawan kejadian tumpahan minyak dari kapal-kapal yang melalui Selat Melaka dan Selat Singapura

Pengurusan Tabung ini dilaksanakan secara bergilir-gilir dikalangan tiga (3) buah negara anggota iaitu Malaysia, Singapura dan Indonesia bagi tempoh lima (5) tahun setiap giliran. Pada tahun 2011, pengurusan tabung ini ditadbir oleh *Directorate General Sea Transportation* di bawah Kementerian Pengangkutan negara Indonesia untuk tempoh lima (5) tahun.

Di antara aktiviti yang dilaksanakan oleh Jawatankuasa Tabung Pusingan pada tahun 2018 adalah seperti berikut:

- i. Bengkel Pengoperasian dan Penggunaan Dispersant oleh Negara-negara Berpantai dan Bengkel Meningkatkan Kesedaran Berkenaan *Dispersant* di Selat Melaka dan Singapura di Hotel Bayview, Pulau Pinang pada 13 hingga 15 Ogos 2018. Program tersebut dihadiri oleh delegasi luar negara daripada Singapura dan Indonesia serta peserta dari agensi-agensi kerajaan, swasta dan universiti.
- ii. Mesyuarat Teknikal *Revolving Fund Committee* (RFC) pada 15 hingga 17 Ogos 2018 di Hotel Bayview Pulau Pinang. Mesyuarat dihadiri oleh wakil-wakil dari *Maritime Port Authority (MPA)* Singapura, *Ministry of Transportation of the Republic Indonesia*, Jabatan Alam Sekitar Malaysia dan Jabatan Laut Malaysia.

STRAITS OF MALACCA AND SINGAPORE REVOLVING FUND COMMITTEE (RFC)

RFC Fund was established on February 11, 1981 for the purpose to be used in of combating oil spills from ships passing through the Straits of Malacca and Singapore.

The Fund is administered on a rotation basis among the three (3) member countries, namely Malaysia, Singapore and Indonesia for a period of five (5) years each. In 2011, the fund is administered by Directorate General Sea Transportation under Ministry of Transportation, Indonesia for duration of five (5) years.

Among the activities carried out by the RFC in the year 2018 are:

- i. The Regional Workshop on the Dispersant Usage and Operation by the Littoral States and Workshop on Enhancing Awareness on Dispersant in the Straits of Malacca and Singapore in Bayview Hotel, Penang on 13th August to 15th August 2018. The program involved international delegation from Singapore and Indonesia as well as government agencies, private sector and university.
- ii. Revolving Fund Committee Technical Meeting (RFC) from 15th August to 17th August 2018 at Bayview Hotel, Penang. The meeting was attended by delegations from Maritime Port Authority (MPA) Singapore, Ministry of Transportation of the Republic Indonesia, Department of Environment Malaysia and Marine Department of Malaysia.



iii. Mesyuarat Jawatankuasa Induk ke-37 *Revolving Fund Committee (RFC)* pada 14 hingga 16 November 2018 di Hotel Seri Pacific Kuala Lumpur. Mesyuarat dihadiri oleh ahli-ahli RFC dari *Maritime Port Authority (MPA) Singapura, Ministry of Transportation of the Republic Indonesia, Jabatan Alam Sekitar Malaysia, Kaunselor Malacca Straits Council of Japan* dan wakil dari Jabatan Laut Malaysia.

iii. 37th Meeting of the Revolving Fund Committee (RFC) from 14th November to 16th November 2018 at Seri Pacific Hotel Kuala Lumpur. The meeting was attended by RFC members from Maritime Port Authority (MPA) Singapore, Ministry of Transportation of the Republic Indonesia, Department of Environment Malaysia, Counsellor Malacca Straits Council of Japan and representative from Department of Marine Malaysia.



Bengkel Pengoperasian dan Penggunaan Dispersant oleh Negara-negara Berpantai dan Bengkel Meningkatkan Kesedaran Berkenaan Dispersant di Selat Melaka dan Singapura di Hotel Bayview, Pulau Pinang pada 13 hingga 15 Ogos 2018.



The Regional Workshop on the Dispersant Usage and Operation by the Littoral States and Workshop on Enhancing Awareness on Dispersant in the Straits of Malacca and Singapore in Bayview Hotel, Penang on 13th August to 15th August 2018.



Mesuarat Teknikal *Revolving Fund Committee (RFC)* pada 15 hingga 17 Ogos 2018 di Hotel Bayview Pulau Pinang.
Revolving Fund Committee Technical Meeting (RFC) from 15th August to 17th August 2018 at Bayview Hotel, Penang.



Mesuarat Jawatankuasa Induk ke-37 *Revolving Fund Committee (RFC)* pada 14 hingga 16 November 2018 di Hotel Seri Pacific Kuala Lumpur.
 37th Meeting of the *Revolving Fund Committee (RFC)* from 14th November to 16th November 2018 at Seri Pacific Hotel Kuala Lumpur.



PEMBANGUNAN SISTEM CETAK JARI HIDROKARBON

Malaysia merupakan negara pesisiran maritim yang dikelilingi oleh Laut China Selatan, Selat Melaka dan Laut Sulu. Kawasan-kawasan ini kaya dengan sumber petroleum terutama di kawasan Zon Ekonomi Eksklusif (ZEE) Malaysia. Faktor ini telah meletakkan Perairan Wilayah dan kawasan ZEE Malaysia sebagai kawasan yang berisiko tinggi untuk berlakunya kes pencemaran marin terutamanya pencemaran minyak.

Kebanyakan kes pencemaran minyak di perairan negara sukar dikenal pasti puncanya kerana ketiadaan pangkalan data cetak-jari hidrokarbon yang dibangunkan dalam negara. Justeru itu, JAS telah mengorak langkah proaktif dengan membangunkan satu sistem iaitu *Hydrocarbon Fingerprinting System (HyFIS)* yang mengandungi pangkalan data cetak-jari hidrokarbon. Objektif utama pembangunan sistem ini ialah untuk menangani kes-kes pencemaran minyak di laut terutama bagi punca yang sukar dikenalpasti. Sistem HyFIS akan membantu meningkatkan kecekapan pegawai JAS dalam siasatan dengan mengecilkan skop carian punca tersebut dengan melakukan pencarian punca menggunakan sistem ini. Langkah ini juga membawa satu lembaran baru kepada JAS dalam mempertingkatkan tindakan penguatkuasaan ke atas kes-kes pencemaran marin negara melalui pendekatan forensik alam sekitar.

Sistem ini telah dibangunkan dengan kerjasama Jabatan Kimia Malaysia (JKM) dan PETRONAS. Satu Memorandum Persefahaman (MoU) Kerjasama Dalam Membangunkan Pangkalan Data Cetak-Jari Hidrokarbon Antara Kerajaan Malaysia dan PETRONAS telah ditandatangani pada 21 Februari 2018.

DEVELOPMENT OF HYDROCARBON FINGERPRINTING SYSTEM

Malaysia is a maritime coastline surrounded by the South China Sea, the Straits of Malacca and the Sulu Sea. These areas are rich in petroleum resources especially in Malaysia's Exclusive Economic Zone (EEZ). This factor has placed Malaysian Territory and ZEE Malaysia as a high-risk area to deal with marine pollution, especially oil pollution.

Most of the oil pollution cases occurred are difficult to identify because the hydrocarbon fingerprinting database has not been developed yet in Malaysia. To tackle this issue, DOE has been proactive in developing a system called the Hydrocarbon Fingerprinting System (HyFIS) that contains the hydrocarbon fingerprinting database. The main objectives in developing the system is to handle the oil pollution cases at sea where the sources are difficult to be identified. HyFIS will increase the efficiency of DOE officers in investigating the cases by narrowing down the scope by searching for the source using the system. This step has brought a new shift to the DOE in enhancing the enforcement on marine pollution cases through the environmental forensic approach.

This system was developed in collaboration with the Department of Chemistry Malaysia and PETRONAS. A Memorandum of Understanding (MoU) on Cooperation in Developing Hydrocarbon Print-In-Stroke Database Between the Government of Malaysia and PETRONAS was signed on 21 February 2018.

Sepanjang pembangunan sistem ini, sebanyak 11 bengkel telah diadakan melibatkan semua pengguna sistem ini.

Throughout the development of this system, a total of 11 workshops were organized and attended by all the users of the system.



Bengkel *User Acceptance Test (UAT)* untuk Pegawai-Pegawai Jabatan Alam Sekitar di EIMAS pada 1 hingga 3 Ogos 2018.

User Acceptance Test (UAT) Workshop for Department of Environment Officers at EIMAS from 1st August to 3rd August 2018.



PENCEMARAN MARIN MARINE POLLUTION

Sepanjang tahun 2018, sejumlah 45 kes aduan pencemaran tumpahan minyak telah dilaporkan kepada Jabatan Alam Sekitar iaitu 18 kes berlaku di Laut China Selatan, 1 kes di Laut Sulu, 17 kes di Selat Melaka dan 9 kes di Selat Johor (**Jadual 4.12**).

Daripada 45 jumlah kes tumpahan minyak yang berlaku pada tahun 2018, 31 kes daripada punca yang tidak diketahui seperti pencemaran bebola tar, 8 kes berpunca daripada kapal dan 6 kes berlaku di pelabuhan yang berpunca daripada kebocoran injap dan paip pemindah (**Jadual 4.13**).

MARINE POLLUTION

Throughout 2018, there were 45 cases of marine pollution from oil spills were reported to Department of Environment whereby 18 cases occurred in the South China Sea, 1 case in the Sulu Sea, 17 cases in the Straits of Malacca and 9 cases in the Straits of Johore (**Table 4.12**).

Out of 45 cases of oil spill in 2018, 31 cases from unknown sources such as tarball pollution, 8 cases originated from ships and 6 cases happened at port due to valves and pipe transfer leakage (**Table 4.13**).

Jadual 4.12 : Kejadian Pencemaran Minyak 2018
Table 4.12 : Oil Pollution Incidents 2018

LOKASI LOCATION	KAWASAN AREA		BIL. KES NO. OF CASES	NEGERI STATE
Laut China Selatan South China Sea	Perairan Malaysia Malaysia Territory	Semenanjung Peninsular	11	Pahang (5) Terengganu (1) Johor (5)
		Malaysia Timur East Malaysia	7	Sabah (2), Sarawak (4) Labuan (1)
	Zon Ekonomi Eksklusif (EEZ) Exclusive Economic Zone (EEZ)		-	-
Laut Sulu Sulu Sea	Perairan Malaysia Malaysia Territory	Sabah	1	Sabah (1)
Selat Melaka Straits of Malacca	Perairan Malaysia Malaysia Territory		17	Pulau Pinang (3) Perak (1), Melaka (1) Selangor (8), Johor (3) Kedah (1)
Selat Johor Straits of Johor	Perairan Malaysia Malaysia Territory	Barat/West	5	Johor (5)
		Timur/East	4	Johor (4)
JUMLAH TOTAL			45	

Jadual 4.13 : Bilangan Kes Tumpahan Minyak Mengikut Punca, 2018
Table 4.13 : Number Of Oil Spill Incidents By Source, 2018

PUNCA SOURCE	KEJADIAN INCIDENT	BILANGAN NUMBER
Jumlah Total		45
Kapal Vessel	Perlanggaran Collision	1
	Terkandas/karam Grounding/sink	-
	Pemindahan minyak dari kapal ke kapal Ship to ship transfer	3
	Pengisian minyak Fuel Filling	2
	Kerosakan enjin Engine damage	2
Pelabuhan/terminal Port/terminal	Kebocoran injap Valves leakage	5
	Kebocoran paip pemindah Transfer pipe leakage	1
Lain-lain Others	Punca tidak dapat dikenal pasti Unknown source	31



Kejadian Tumpahan
Minyak Di Laut
Occurrence of Oil Spill at
Sea



Aktiviti Pembersihan
Tumpahan Minyak
Di Pantai
Oil Spill Cleanup Activities



PROJEK-PROJEK YANG DIJALANKAN DIBAWAH RANCANGAN MALAYSIA KE 11 (RMK-11)

Jabatan Alam Sekitar (JAS), sejak awal penubuhan telah berusaha menguatkuasakan Akta Kualiti Alam Sekeliling, 1974 ke atas punca-punca pencemaran termasuk punca-punca yang menyumbang kepada pencemaran air. Penguatkuasaan ke atas punca-punca yang menyumbang kepada pencemaran air oleh JAS sejak beberapa tahun kebelakangan ini menunjukkan bahawa punca-punca yang dipantau oleh JAS telah mencapai tahap pematuhan yang tinggi. Namun, indeks kualiti air sungai tidak menunjukkan peningkatan kualiti air sungai seiring dengan peningkatan tahap pematuhan punca-punca pencemaran terhadap Akta Kualiti Alam Sekeliling, 1974.

Kemerosotan kualiti air sungai yang berlaku pada masa ini menunjukkan bahawa terdapat sungai-sungai yang sudah tidak lagi mampu menampung beban pencemaran secara berterusan. Daya tampung (*carrying capacity*) sungai untuk menerima beban pencemar telah menyusut dan sudah tidak mampu lagi untuk mengekalkan kualiti air sungai dalam keadaan yang baik dan sesuai bagi kegunaan berfaedah. Kaedah kawalan pelepasan efluen berasaskan kepekatan bahan pencemar dari sektor industri yang tertakluk di bawah Akta Kualiti Alam Sekeliling 1974 sahaja tidak berupaya mengawal pencemaran yang masuk ke dalam sungai bagi memastikan kegunaan berfaedah sungai dipulihara dan kualiti air sungai dapat ditingkatkan.

Justeru, JAS telah mengambil inisiatif untuk menjalankan Kajian Pembangunan dan Pelaksanaan *Total Maximum Daily Load (TMDL)* di bawah Rancangan

PROJECTS UNDER THE 11th MALAYSIA PLAN (RMK-11)

The Department of Environment (DOE) since its establishment has enforced the Environmental Quality Act, (EQA) 1974 on pollution sources including the sources that contribute to water pollution. Enforcement of the sources subjected to EQA 1974 by the DOE over the past few years has shown that sources monitored and enforced by the DOE has reached a high level of compliance. However, the river water quality index does not show improved river water quality as the level of compliance of the act.

The current deterioration of river water quality indicates that rivers are no longer able to cope with pollutant loading on an ongoing basis. The carrying capacity of rivers to receive pollutant loads has shrunk and is no longer able to maintain river water quality in good condition and suitable for its beneficial use. The effluent discharge control method based on pollutant concentration from the industrial sector subjected to the Environmental Quality Act 1974 alone is not capable of controlling the pollution entering the river to ensure that the beneficial use of the river is conserve and the river's water quality can be improved.

Therefore, the DOE has taken the initiative to carry out the Total Maximum Daily Load (TMDL) Development and Implementation Study under the Eleventh

Malaysia Kesebelas (RMKe-11). Kajian ini mengambil masa selama 24 bulan yang bermula pada akhir tahun 2016 hingga akhir tahun 2018 melalui perunding yang dilantik. Pelaksanaan TMDL ini telah lama diamalkan secara meluas oleh beberapa negara maju di dunia. Mekanisma pelaksanaannya adalah bermula dengan penetapan Jumlah Beban Harian Maksimum atau *Total Maximum Daily Load (TMDL)* yang boleh diterima oleh sesebuah jasad air seperti sungai agar tidak menyebabkan kemerosotan terhadap kualiti air serta untuk memperbaiki kualiti air ke arah sasaran kegunaan berfaedah yang dikehendaki. Melalui pendekatan ini selain punca industri yang dikawal di bawah Jabatan Alam Sekitar, punca-punca lain seperti premis komersial, restoran dan pasar-pasar basah, ladang-ladang pertanian dan penternakan, kawasan pembukaan tanah, pengkuarian pasir dan lain-lain lagi yang dikawal di bawah bidangkuasa pelbagai agensi akan diambilkira.

Lembangan Sungai Semenyih dipilih sebagai kawasan kajian memandangkan lembangan ini mempunyai Loji Rawatan Air (LRA) utama bagi kegunaan penduduk Lembah Klang, Selangor dan Putrajaya. Sistem sungai yang terdapat dalam Lembangan ini dikongsi oleh dua negeri iaitu Selangor dan Negeri Sembilan.

Agensi yang berkepentingan (*stakeholder*) telah dilibatkan sepanjang kajian dilaksanakan. Ianya bagi memastikan cadangan pelaksanaan TMDL yang dibentuk dari hasil kajian adalah praktikal dan sesuai dilaksanakan oleh semua agensi pelaksana dalam mengawal aktiviti pembangunan dan penguatkuasaan ke atas punca pencemaran yang menyumbang kepada beban pencemaran sungai yang tertakluk di bawah agensi masing-masing. Antara agensi utama

Malaysia Plan (RMK11). The study takes 24 months of which started from the end of 2016 and completed by the end of 2018 through an appointed consultant. The implementation of TMDL has been widely practiced by various developed countries in the world. The implementation mechanism starts with the setting of Maximum Daily Load (TMDL) that can be received by water body such as a river so as not to cause deterioration of water quality as well as to improve water quality towards the targeted beneficial uses. Through this approach, besides the industrial sources controlled by the DOE, other sources such as commercial premises, restaurants and wet markets, agricultural and livestock farms, land clearing, sand quarrying and others, under the jurisdiction of various agencies will also be taken into account.

Sungai Semenyih Basin was chosen as a study area as it has a main water treatment plant (LRA) for the residents of the Klang Valley, Selangor and Putrajaya. The river system in the Basin is shared by two states namely Selangor and Negeri Sembilan.

All stakeholders were involved during the study. This is to ensure that TMDL's proposed implementation from the results of the study is practical and applicable by all implementing agencies in regulating all development and enforcement activities on the sources of pollution which contribute to the river pollution. Among the major Federal and State agencies that have been directly involved are agencies under the Ministry of Energy, Science, Technology, Climate Change and Environment, Ministry of



Persekutuan dan Negeri yang telah terlibat secara langsung adalah agensi-agensi di bawah Kementerian Tenaga, Sains, Teknologi, Perubahan Iklim dan Alam Sekitar, Kementerian Air, Tanah dan Sumber Asli, Kementerian Pertanian dan Industri Asas Tani, Kementerian Perumahan dan Kerajaan Tempatan, Kementerian Kesihatan Malaysia, Badan Kawalselia Air Negeri dan Pihak Berkuasa Tempatan.

Hasil kajian ini menyenaraikan langkah dan juga cadangan pelaksanaan langkah pemuliharaan kualiti air sungai melalui pendekatan kawalan had kuantiti beban pencemar berbanding standard/had kepekatan pencemar yang telah diamalkan sejak sekian lama. Pelaksanaan TMDL dengan berkesan akan mampu memberikan hasil yang positif terhadap kualiti air sungai sungguhpun ia akan mengambil masa yang panjang.

Water, Land and Natural Resources, Ministry of Agriculture and Agro-based Industry, Ministry of Housing and Local Government, Ministry of Health Malaysia, State Water Regulatory Authority and Local Authorities.

This study outlined the steps and recommendations of the implementation of the river water quality conservation measures through the control limit of the pollutant load quantity compared to the pollutant concentration standard/limit that has been practiced ever since. The implementation of TMDL will effectively provide a positive result to the river water quality although it will take a long time.

PROGRAM PENGAWASAN KUALITI ALAM SEKITAR

Program Pengawasan Kualiti Alam Sekitar atau EQMP merupakan program yang merangkumi pengumpulan data bagi pemantauan kualiti udara, kualiti air sungai dan kualiti air marin di seluruh Malaysia bagi tujuan melaporkan tahap sebenar kualiti alam sekitar negara dalam usaha untuk memantau, mencegah dan mengawal pencemaran.

Sistem pengawasan EQMP akan berperanan sebagai mekanisme amaran awal bagi kejadian pencemaran alam sekitar seperti jerebu, tumpahan minyak, bencana industri dan pelupusan haram buangan serta toksik berbahaya. Ia juga boleh membantu pembuat dasar dan pembuat keputusan ke atas

ENVIRONMENTAL QUALITY MONITORING PROGRAMME (EQMP)

Environmental Quality Monitoring Programmes or EQMP is a programme that includes data collection for monitoring of air quality, river water quality and marine water quality throughout Malaysia for the purpose of reporting the actual level of environmental quality in order to monitor, prevent and control the pollution.

The EQMP's monitoring system will serve as an early warning mechanisms for the occurrence of environmental pollution such as haze, oil spill disaster and illegal disposal of toxic and harmful industrial wastes. It can also assist policy and decision makers to provide inputs enforcement activities conducted by the

aktiviti penguatkuasaan Jabatan Alam Sekitar dan agensi berkaitan dalam menyediakan input kepada perancangan projek-projek pembangunan.

DOE and related agencies as well as for planning of projects development.

Sepanjang tahun 2018, semua stesen-stesen pengawasan beroperasi membekalkan data kualiti alam sekitar kepada pihak JAS.

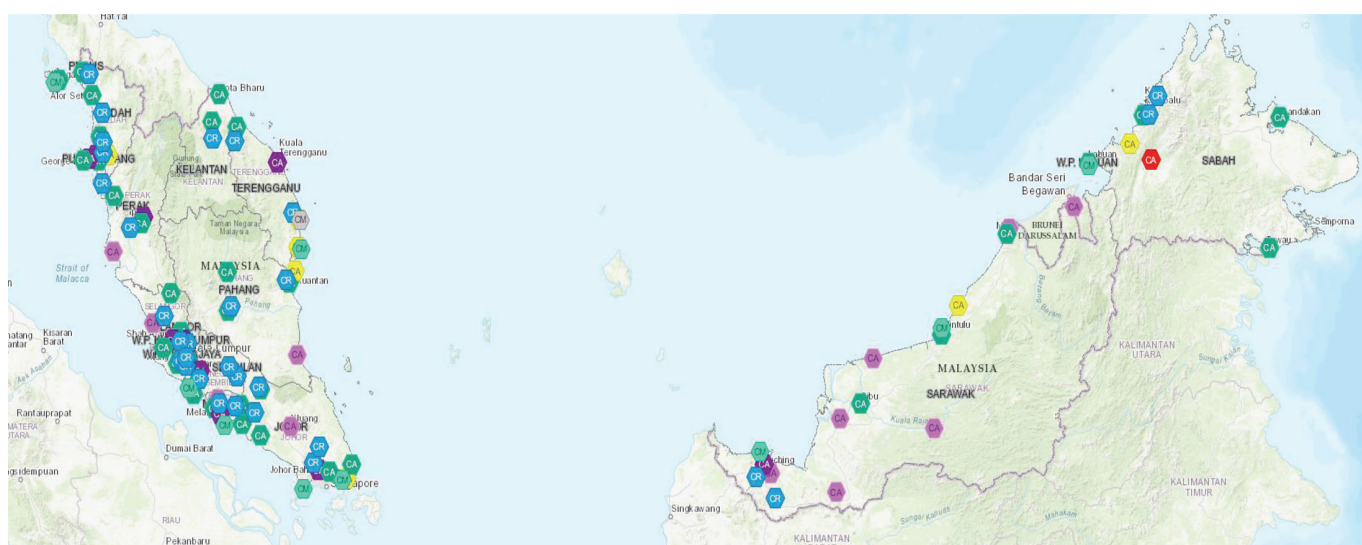
In the year 2018, all monitory stations operated and supplied environmental quality data to the DOE.

Jadual 4.14 : Bilangan Stesen Pengawasan Alam Sekitar di Malaysia
Table 4.14 : Number of Environmental Monitoring Station in Malaysia

KOMPONEN COMPONENT	STESEN AUTOMATIK AUTOMATIC STATION	STESEN MANUAL MANUAL STATION
Udara Air	65	14
Air Sungai River Water	30	1,353
Air Marin Marine Water	10	388
JUMLAH STESEN TOTAL NO. OF STATIONS	105	1,755

Berikut disertakan taburan stesen automatik pengawasan kualiti alam sekitar bagi stesen kualiti udara, kualiti air sungai dan kualiti air marin di Malaysia.

The following is the distribution of continuous monitoring stations of air quality, river water quality and marine water quality in Malaysia.



Rajah 4.2 : Taburan Stesen Pengawasan Kualiti Udara, Air Sungai dan Air Marin Automatik, 2018

Figure 4.2 : Distribution of Continuous Air, River and Marine Quality Monitoring Station, 2018

Bagi stesen-stesen manual pengawasan kualiti alam sekitar, berikut adalah persampelan manual yang telah dijalankan bagi tahun 2018:

For manual stations of environmental quality monitoring, the following is the number of manual sampling conducted in year 2018:

Jadual 4.15 : Bilangan Persampelan Manual Tahun 2018
Table 4.15 : Number Of Manual Sampling, 2018

KOMPONEN COMPONENT	STESEN MANUAL MANUAL STATION	FREKUENSI PERSAMPELAN SAMPLING FREQUENCY	BILANGAN PERSAMPELAN TOTAL NO. OF SAMPLING
Udara Air	14	Setiap 6 hari Every 6 days	854
Air Sungai River Water	1,353	6 kali setahun 6 times a year	8,086
Air Marin Marine Water	388	6 kali setahun 6 times a year	2,268

Dalam Komponen Udara, selain daripada stesen automatik dan manual, program EQMP ini juga menyediakan stesen pengawasan kualiti udara automatik bergerak atau *Mobile Continuous Air Quality Monitoring (MCAQM)* bagi memenuhi aspirasi penempatan stesen pengawasan kualiti udara di seluruh negara. Sebanyak tiga (3) buah stesen pengawasan kualiti udara bergerak disediakan yang mana ianya ditempatkan setiap satu (1) buah di Semenanjung, Sabah dan Sarawak. Gambarfoto dibawah menunjukkan stesen pengawasan kualiti udara bergerak yang ditempatkan di lokasi Johan Setia, Klang, Selangor bagi memantau tahap kualiti udara setempat di kawasan tersebut.

In the Air Component, EQMP also provides Mobile Continuous Water Quality Monitoring (MCAQM) to meet the aspirations of the placement of monitoring stations air quality across the country. A total of three (3) mobile air quality monitoring stations available, which are placed every one (1) in Peninsular Malaysia, Sabah and Sarawak. Below show mobile air quality monitoring stations located on site Johan Setia, Klang, Selangor for monitoring air quality levels in the area.



Stesen Pengawasan Kualiti Udara Bergerak
Mobile Continuous Air Quality Monitoring (MCAQM)



Jadual 4.16 : Senarai Program/Aktiviti/Latihan yang Dilaksanakan Di bawah Program EQMP Sepanjang Tahun 2018

Table 4.16 : List of Programme/Activities/Training of EQMP, 2018

BIL NO	TARIKH DATE	PROGRAM / AKTIVITI / LATIHAN PROGRAMME / ACTIVITIES / TRAINING	LOKASI LOCATION
1	3 Mac 2018	Perasmian Stesen Marin Santubong, Sarawak	Santubong, Sarawak
2	5 hingga 9 Mac 2018	Kursus Statistik Pengurusan Alam Sekitar	Puchong, Selangor
3	19 hingga 23 Mac 2018	Kursus EQMP Zon Timur dan QUAL2K	Kuala Besut, Terengganu
4	17 Mac 2018	Perasmian Stesen Udara, Tangkak Johor	Tangkak, Johor
5	14 hingga 18 Mei 2018	Kursus EQMP Negeri Sabah	Kota Kinabalu, Sabah
6	9 hingga 13 Julai 2018	Kursus EQMP Negeri Sarawak	Kuching, Sarawak
7	6 hingga 10 Ogos 2018	Kursus Pencemaran Udara	Bangi, Selangor
8	1 hingga 5 Okt 2018	Kursus EQMP (Pengarah JAS Malaysia)	Kuala Lumpur
9	29 Okt hingga 2 Nov 2018	Kursus EQMP Zon Utara	Alor Setar, Kedah
10	12 hingga 15 November 2018	Kursus Asas Renang dan Menyelamat	Putrajaya
11	14 hingga 16 November 2018	Better Air Quality (BAQ) Conference 2018	Kuching, Sarawak
12	17 hingga 21 December 2018	Kursus EQMP Zon Selatan	Johor Bahru, Johor



Latihan asas renang dan menyelamat kepada pegawai JAS yang terlibat dalam pengawasan kualiti air
Basic swimming and rescue training course for DOE officers involve in water quality monitoring

**Jadual 4.17 : Senarai Lawatan Rasmi Daripada Pihak Luar Ke Pusat Data Alam Sekitar (EDC)
Di Bawah Program EQMP Sepanjang Tahun 2018**

Table 4.17 : List of Official Visits To The Environmental Data Centre (EDC) In Year 2018

BIL NO	TARIKH DATE	LAWATAN RASMI DARIPADA AGENSI AWAM/SWASTA OFFICIAL VISITS FROM PUBLIC/SPECIAL AGENCIES
1	30 Januari 2018	Ketua Pengarah Agensi Pengurusan Bencana Negara (NADMA), Jabatan Perdana Menteri
2	29 Mac 2018	Jabatan Alam Sekitar Negeri Kedah
3	29 Mac 2018	Pelajar Universiti Kebangsaan Malaysia
4	19 Julai 2018	National Environment Agency, Singapore
5	26 Julai 2018	Datuk Seri KSU Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC)
6	26 Ogos 2018	Peserta Malaysia Technical Cooperation Programme (MTCP)
7	29 Ogos 2018	Jabatan Alam Sekitar Wilayah Persekutuan Kuala Lumpur
8	16 Oktober 2018	Pegawai-pegawai GHSSE, PETRONAS
9	15 November 2018	Pegawai-Pegawai Projek Lebuhraya Utara Selatan (PLUS)
10	14 Disember 2018	Media ASTRO AWANI



Lawatan Rasmi Ketua Setiausaha MESTECC dan Ketua Pengarah Agensi Pengurusan Bencana Negara (NADMA) ke EDC, JAS

Official Visit from the Secretary General of MESTECC and Director General of the National Disaster Management Agency (NADMA) to EDC, DOE



PENGUATKUASAAN TERHADAP AKTIVITI PEMBAKARAN TERBUKA

Kes pembakaran terbuka dikesan melalui operasi rondaan mencegah pembakaran terbuka yang dilaksanakan oleh JAS Negeri di kawasan-kawasan yang dikenalpasti sebagai kawasan yang berisiko berlaku kebakaran dan sering menerima aduan daripada orang awam. Di samping itu maklumat *hotspots* juga diperolehi melalui satelit yang dipantau dan dilaporkan oleh ASEAN Specialised Meteorological Centre (ASMC) yang berpusat di Singapura. Pada tahun 2018 sebanyak kes 520 *hotspots* di seluruh negara telah dilaporkan melalui satelit (**Jadual 4.18**).

Sebanyak 2,768 kes pembakaran terbuka pula telah dikesan pada tahun 2018 (**Jadual 4.19, Jadual 4.20 dan Rajah 4.3**) dan dilaporkan oleh setiap JAS Negeri melalui sistem atas talian dalam JAS iaitu Sistem Elektronik Kawalan Alam Sekitar (e-KAS) dibawah Sub-Modul Pembakaran Terbuka dan Sub-Modul Aduan. Kejadian pembakaran terbuka yang utama sering berlaku adalah pembakaran sampah sarap di kawasan perumahan, pembakaran sampah sarap di tepi bahu jalan dan pembakaran untuk aktiviti keagamaan atau penyembahan yang dikategorikan sebagai lain-lain aktiviti (1,767 kes), belukar (297 kes) dan pertanian (233 kes) terutamanya semasa cuaca panas dan kering iaitu pada bulan Julai (377 kes) dan Ogos (585 kes). Daripada 2,768 kes pembakaran terbuka tersebut, 273 kes telah dikompaun dengan jumlah kompaun yang dikutip ialah sebanyak RM 328,200.00

ENFORCEMENT AGAINST OPEN BURNING ACTIVITIES

Open burning cases were detected during daily ground surveillance conducted by DOE State Offices at fire-prone areas, which have frequent public complaints and also through hotspots detected via satellites reported by the ASEAN Specialised Meteorological Centre (ASMC) based in Singapore. Throughout the year of 2018, a total of 520 hotspots were detected via satellites (**Table 4.18**).

A total of 2,768 open burning cases were detected in 2018 (**Table 4.19, Table 4.20 and Figure 4.3**) and these cases were reported by the DOE State Offices via DOE's internal online system (e-KAS) under the Open Burning Sub-Module and Complaint Sub-Module. Frequent open burning incidents were found to occur from activities such as burning of garbage in residential area, garbage burning by roadside and burning of any articles as part of religious rites or worshipping activities (categorised as other activities) (1,767 cases), bushes (297 cases) and agricultural areas (233 cases) that normally occurred during the hot and dry period in the months of July (377 cases) and August (585 cases). Out of the 2,768 open burning cases detected, 273 cases were issued with compounds amounted up to RM 328,200.00

Berdasarkan kepada data bilangan *hotspots* serta pembakaran terbuka bagi tempoh 5 tahun kebelakang iaitu dari tahun 2014 sehingga 2018 (**Rajah 4.4**), tahun 2017 mencatatkan jumlah bilangan *hotspots* dan kes pembakaran terbuka yang paling rendah. Manakala kes *hotspots* dan pembakaran terbuka tertinggi dalam tempoh tersebut dicatatkan pada tahun 2014 iaitu bilangan *hotspots* sebanyak 4,354 dan bilangan kes pembakaran terbuka sebanyak 6,083 kes.

According to the data on hotspot numbers and open burning for the last 5 year period which is from 2014 to 2018 (**Figure 4.4**), 2017 recorded the lowest number of hotspots and open burning cases. The high of hotspot number and open burning cases during the period were recorded to be the highest in 2014, which recorded at 4,354 of hotspots and 6,083 of open burning cases.

Jadual 4.18 : Bilangan Kes Hotspots Dikesan Melalui Satelit Mengikut Negeri, 2018
(Sumber: ASMC)

Table 4.18 : Number of Hotspots Detected through Satellite by States, 2018
(Source: ASMC)

NEGERI STATE	BULAN MONTH												JUMLAH TOTAL
	JAN JAN	FEB FEB	MAR MARCH	APR APR	MEI MAY	JUN JUNE	JUL JULY	OGOS AUG	SEP SEPT	OKT OCT	NOV NOV	DIS DEC	
Johor	1	2	5	0	5	0	0	3	3	0	0	0	19
Kedah	0	0	3	0	0	0	0	0	0	0	0	0	3
Kelantan	0	1	5	4	2	0	1	6	1	0	0	0	20
Melaka	0	0	0	0	1	0	0	0	0	0	0	0	1
Negeri Sembilan	0	0	2	1	0	0	3	2	0	1	0	0	9
Pahang	0	5	18	19	19	17	27	41	16	7	3	0	172
Perak	0	0	2	0	0	0	2	3	0	0	0	0	7
Perlis	0	0	1	0	0	0	0	0	0	0	0	0	1
Pulau Pinang	0	0	2	0	0	0	0	0	0	0	0	0	2
Sabah	0	5	15	7	5	5	7	26	12	7	3	1	93
Sarawak	4	11	24	14	12	10	42	43	9	3	0	2	174
Selangor	0	2	0	0	0	0	1	1	0	0	0	0	4
Terengganu	0	1	4	2	1	2	1	3	0	0	1	0	15
W.P. Kuala Lumpur/ Putrajaya	0	0	0	0	0	0	0	0	0	0	0	0	0
W.P. Labuan	0	0	0	0	0	0	0	0	0	0	0	0	0
Jumlah Total	5	27	81	47	45	34	84	128	41	18	7	3	520
JUMLAH KESELURUHAN / TOTAL : 520													

Jadual 4.19 : Bilangan Kes Pembakaran Terbuka Mengikut Negeri, 2018
Table 4.19 : Number Of Open Burning Cases By States, 2018

NEGERI STATE	KATEGORI / CATEGORIES								JUMLAH TOTAL
	Ladang Plantation	Pertanian Agriculture	Belukar Bushes	Hutan Forest	Tapak Pembinaan Construction Sites	Tapak Pelupusan Disposal Sites	Industri Industry	Lain-lain Others*	
Johor	20	11	15	3	8	18	2	243	320
Kedah	6	8	16	4	6	11	0	102	153
Kelantan	5	3	2	16	2	3	0	39	70
Melaka	8	14	25	1	7	6	0	105	166
Negeri Sembilan	5	8	12	2	3	16	0	58	104
Pahang	24	11	122	42	5	2	0	55	261
Perak	8	12	10	3	8	7	2	107	157
Perlis	2	1	1	0	0	0	0	7	11
Pulau Pinang	1	22	7	5	0	13	0	167	215
Sabah	11	82	6	10	4	4	6	145	268
Sarawak	54	44	43	22	1	0	13	28	205
Selangor	1	3	2	2	2	30	1	468	509
Terengganu	1	5	30	11	0	3	4	68	122
W.P. Kuala Lumpur/ Putrajaya	0	9	6	0	6	10	0	172	203
W.P. Labuan	0	0	0	0	1	0	0	3	4
JUMLAH TOTAL	146	233	297	121	53	123	28	1767	2,768
JUMLAH KESELURUHAN / TOTAL : 2,768									

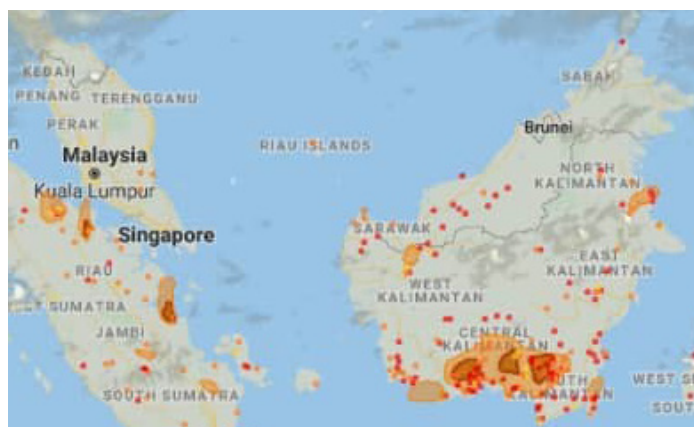
Jadual 4.20 : Bilangan Kes Pembakaran Terbuka Bulanan, 2018
Table 4.20 : Number of Open Burning Cases by Month, 2018

NEGERI STATE	KATEGORI / CATEGORIES								JUMLAH TOTAL
	Ladang Plantation	Pertanian Agriculture	Belukar Bushes	Hutan Forest	Tapak Pembinaan Construction Sites	Tapak Pelupusan Disposal Sites	Industri Industry	Lain-lain Others*	
Januari January	6	5	6	0	10	7	4	98	136
Februari February	14	14	31	9	5	11	1	151	236
Mac March	22	27	48	13	4	8	6	155	283
April April	11	19	28	9	1	7	3	115	193
Mei May	12	14	25	11	6	4	2	48	122
Jun June	4	14	22	8	3	10	1	99	161
Julai July	25	30	42	18	11	24	3	224	377
Ogos August	39	64	52	32	4	15	4	375	585
September September	1	24	21	10	4	22	0	125	207
Oktober October	8	12	12	4	3	3	1	136	179
November November	1	3	6	5	1	9	1	102	128
Disember December	3	8	4	2	1	3	2	138	161
JUMLAH TOTAL	146	234	297	121	53	123	28	1766	2,768
JUMLAH KESELURUHAN / TOTAL : 2,768									

Nota/Note :

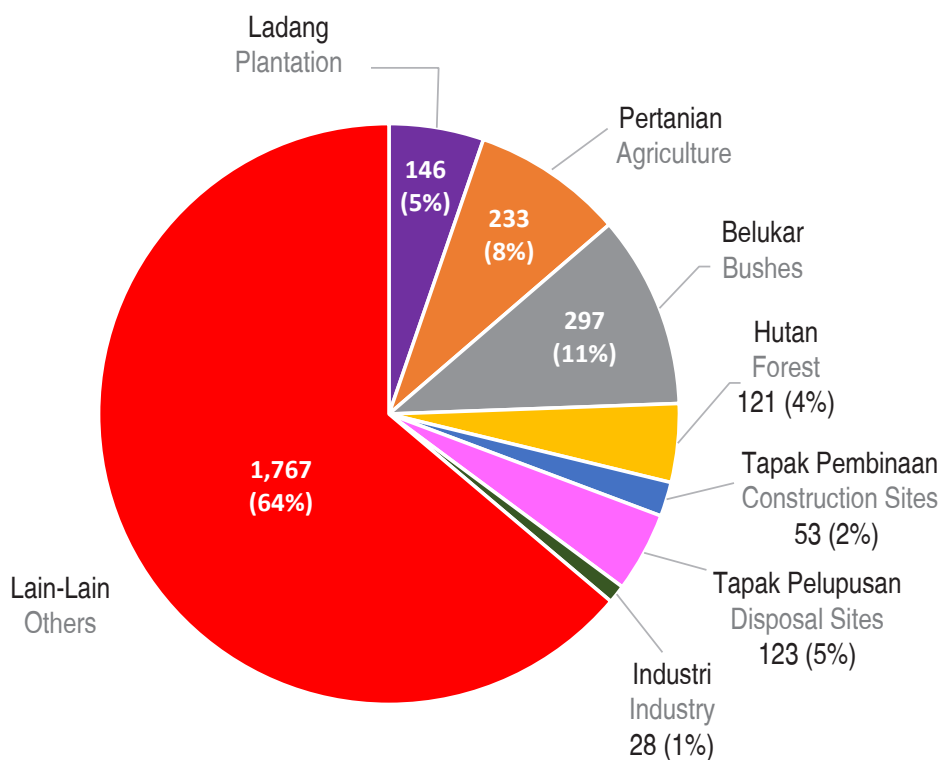
*Lain-lain - Pembakaran sampah sarap di kawasan perumahan, tepi jalan dan aktiviti keagamaan/penyembahan

*Others - Burning of garbage in residential areas, streets and religious activities/worship



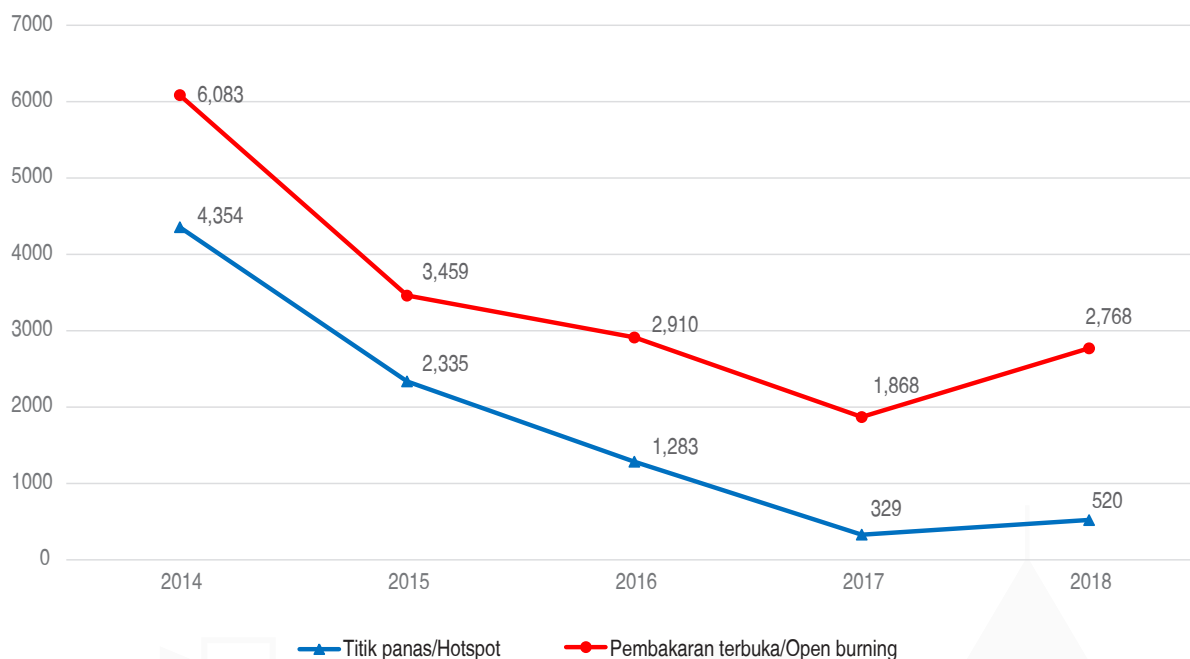
Taburan Hotspots dan
Pembakaran Terbuka
Hotspots Distribution and Open
Burning

Kes Pembakaran Terbuka Pada Tahun 2018 Open Burning Cases For 2018



Rajah 4.3 : Bilangan kes pembakaran terbuka mengikut kategori, 2018
Figure 4.3 : Number of open burning cases by categories, 2018

Bilangan Kes *Hotspots* dan Pembakaran Terbuka Di Malaysia Dari 2014 Sehingga 2018 Number Of Hotspots and Open Burning Cases In Malaysia From 2014 To 2018



Rajah 4.4 : Bilangan *hotspots* dan kes pembakaran terbuka dari tahun 2014 sehingga 2018
Figure 4.4 : Number of hotspots and open burning cases from 2014 to 2018

PROTOKOL MONTREAL DAN PERLINDUNGAN LAPISAN OZON

Latarbelakang

Malaysia telah meratifikasi Konvensyen Vienna bagi Perlindungan Lapisan Ozon dan Protokol Montreal mengenai Bahan-bahan Pemusnah Lapisan Ozon pada 29 Ogos 1989. Sebagai negara Parti kepada Protokol Montreal, Malaysia telah memenuhi obligasi untuk menghentikan pengimportan klorofluorokarbon (CFC), halon dan karbon tetraklorida (CTC) mulai 1 Januari 2010. Manakala bahan pemusnah ozon seperti Metil Bromida telah dikawal pengimportan mulai 1 Januari 2015 untuk kegunaan kuarantin dan pra penghantaran melalui kapal. Manakala penghapusan hidroklorofluorokarbon (HCFC) sedang dijalankan dan akan diberhentikan pengimportan menjelang tahun 2030.

Pada Mesyuarat Parti ke 28 yang telah diadakan di Rwanda, Kigali, Parti-Parti telah bersetuju dengan penyusutan terhadap Bahan Hidrofluorokarbon (HFC) dan dikenali sebagai Pindaan Kigali. Pindaan Kigali akan mula berkuatkuasa pada 1 Januari 2019 atau apabila 20 buah negara telah meratifikasikannya.

Pematuhan Terhadap Protokol Montreal

Bagi fasa seterusnya Malaysia perlu menghapuskan penggunaan HCFC secara berperingkat mulai 2013 sehingga dihapuskan sepenuhnya menjelang 2030 seperti yang telah ditetapkan di bawah Protokol Montreal. Bagi mencapai sasaran ini, Pelan Pengurusan Penghapusan HCFC (HPMP) telah digubal yang menggariskan polisi

MONTREAL PROTOCOL AND PROTECTION OF THE OZONE LAYER

Background

Malaysia ratified the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer on 29 August 1989. As a Party to the Montreal Protocol, Malaysia has complied to the obligation to stop importing chlorofluorocarbon (CFC), halon and carbon tetrachloride (CTC) by 1 January 2010. Other ozone depleting substances such as methyl bromide will only be allowed for quarantine and pre shipment activities from January 2015 while hydrochlorofluorocarbon (HCFC) will be phased out by 2030.

During the 28th Meeting of Parties that was held in Rwanda, Kigali, Parties have agreed with the Hydrofluorcarbon (HFC) phase down known as Kigali Amendment. The amendment will come into force on 1st January 2019 or after twenty (20) countries have ratified the amendment.

Compliance to Montreal Protocol

Malaysia is obligated to phase out HCFC in stages by 2030 under the Montreal Protocol starting from 2013. To meet the phase out target, the HCFC Phase-out Management Plan (HPMP) was formulated that outlined the policies and long term strategies for the phase-out of



dan strategi jangka panjang untuk menghapuskan penggunaan HCFC mulai tahun 2012 hingga 2040. **Jadual 4.21** menunjukkan jadual strategi dan polisi dalam pelaksanaan HPMP. **Rajah 4.5** menunjukkan jadual penghapusan HCFC dalam mematuhi Protokol Montreal di mana HCFC akan dikurangkan sebanyak 10% menjelang 2015, 35% pada 2020, 67.5 % pada 2025, 97.5 % pada tahun 2030 (dengan 2.5 % dihadkan kepada sektor perkhidmatan sahaja) dan HCFC menjadi larangan mutlak pada tahun 2040. **Rajah 4.6** menunjukkan pengimportan HCFC pada tahun 2018 yang berjumlah 4,278 metrik tan.

Pada 1 Januari 2013, selaras dengan pewartaan Perintah Kastam (Larangan Import) 2012 pada 31 Disember 2012 yang berkuatkuasa pada 1 Januari 2013, Malaysia telah melaksanakan sistem kuota bagi mengimport HCFC oleh pengimport yang berdaftar dengan JAS. Permohonan permit kelulusan atau *Approved Permit (AP)* diproses melalui sistem atas talian, e-Permit mengikut agihan kuota HCFC yang diperuntukkan berdasarkan garis dasar atau takat beku berjumlah sebanyak 515.8 ODPT (*Ozone Depleting Potential Tonnes*) atau sebanyak 7,900 Metrik Tan.

Sistem atas talian, "e-Permit", telah diwujudkan untuk memproses dan seterusnya meluluskan permohonan import dan eksport HCFC. Sistem atas talian ini melibatkan jaringan di antara pengimport/pengesport berdaftar HCFC, Jabatan Alam Sekitar dan Sistem Maklumat Kastam (SMK), Jabatan Kastam DiRaja Malaysia. Sistem ini diwujudkan selaras dengan kehendak strategi HPMP iaitu pelaksanaan sistem Kelulusan Permit (AP) dan kuota bagi kawalan import HCFC. Bagi tahun 2018, sebanyak dua ratus enam puluh empat (264) permohonan untuk mengimport HCFC telah diterima daripada 16 pengimport berdaftar dan sebanyak lima (5) permohonan untuk mengeksport HCFC telah diterima melalui sistem e-Permit.

HCFC starting from 2012 until 2040. **Table 4.21** shows the policies and strategies of HPMP. **Figure 4.5** shows the HCFC phase out schedule for Malaysia whereby HCFC will be reduced by 10 % in 2015, 35% in 2020, 67.5% in 2025 , 97.5% by 2030 (2.5% is strictly for servicing sector) and subsequently total ban on HCFC will be imposed by 2040. **Figure 4.6** shows the importation of HCFC in 2018 amounted to 4,278 metric tonnes.

On 1st January 2013, Malaysia implemented the quota system for the importation of HCFC. Application for Approval Permit (AP) was processed by DOE through an online 'e-Permit' system within the quota given with the total amount of HCFC allocated according to baseline level or freeze limit of 515.8 ODPT (ozone depleting potential tonnes) or 7,900 metric tonnes.

The on-line system, "e-Permit", was developed to process and approve import and export of HCFC from registered importers and exporters. The on-line system is a linkage network between the HCFC importers/exporters, Department of Environment Malaysia and the Customs Information System of the Royal Customs of Malaysia. The establishment of this system is in line with the HPMP strategy which is the implementation of Approved Permit (AP) and quota system for import of HCFC. In 2018, two hundred sixty four (264) applications to import HCFC from sixteen (16) registered importers and five (5) applications to export HCFC were received via the system.

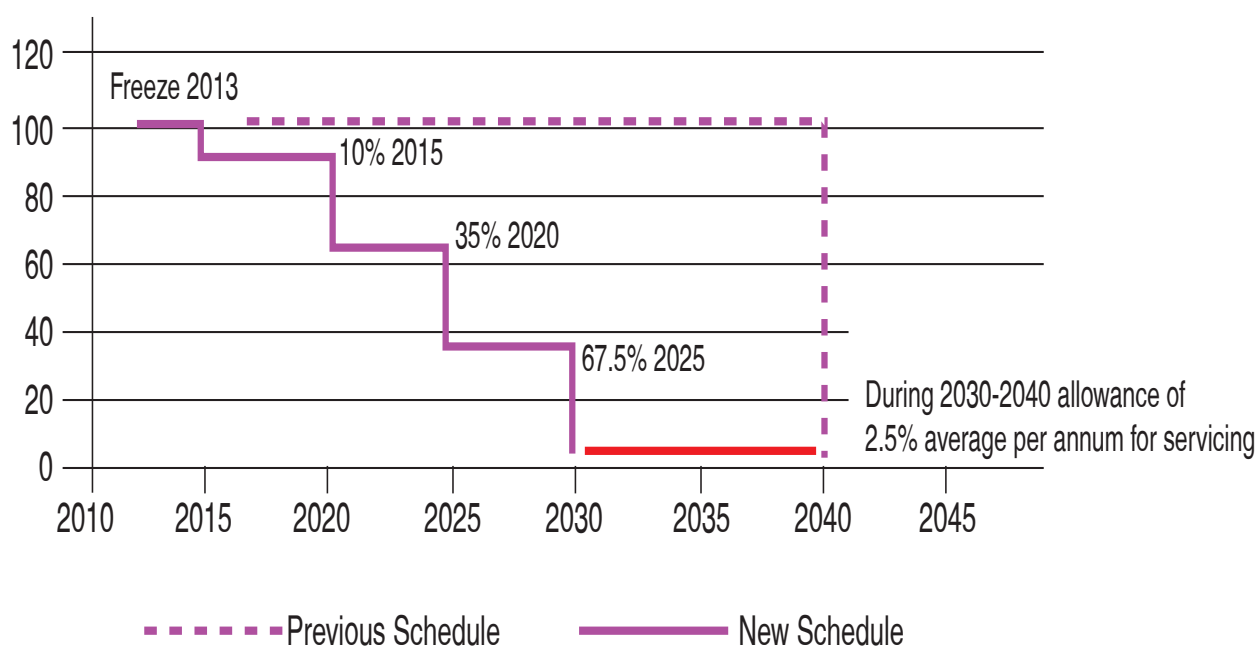
**Jadual 4.21 : Polisi dan Strategi Perundangan Pelan Penghapusan HCFC (HPMP)
(2012–2040)**

**Table 4.21 : Policies And Regulatory Actions Of HCFC Phase Out Management Plan (HPMP)
(2012–2040)**

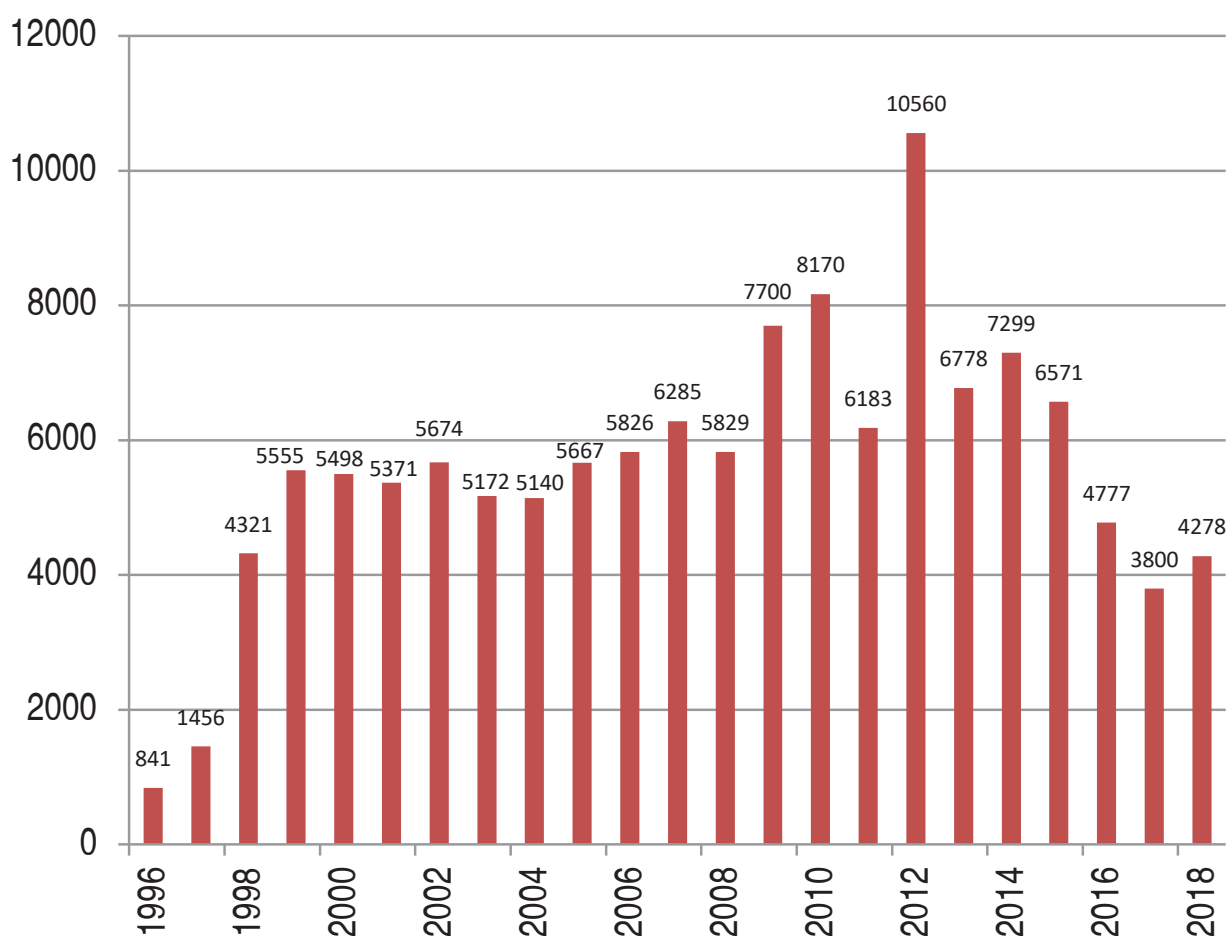
TAHUN YEAR	POLISI DAN TINDAKAN PERUNDANGAN POLICIES AND REGULATORY ACTIONS
2012	Mewujudkan sistem AP bagi pengagihan kuota import HCFC berdasarkan <i>baseline</i> atau purata import 2009/ 2010 Establishment of AP for HCFC import quota based on National average consumption for 2009/2010
	Meminda perundangan sedia ada untuk mengawal penggunaan, import, pembuatan, pemasangan produk dan peralatan yang menggunakan HCFC Amend existing legislation for control on the use, import, manufacture, assembly or installation of products and equipment using HCFCs.
2013	Mewujudkan sistem perlesenan untuk mengeksport semula gas HCFC Licence re-export of HCFC chemicals
	Pelaksanaan sistem AP pada 1 Januari 2013 mengikut Jadual Pembekuan Protokol Montreal Implement Approved Permit (AP) system for HCFC import (by Jan 2013)
	Larangan menambah (expansion) atau membina fasiliti pembuatan baru menggunakan HCFC Prohibit expansion of new manufacturing facilities using HCFCs
	Promosi menggunakan bahan alternatif melalui pemberian insentif Promote the use of alternatives through incentives
	Latihan dan Pensijilan bagi pekerja yang mengendalikan HCFC Undertake certification of skilled workers trained to handle HCFCs
2015	Larangan bagi membuat, memasang dan mengimport peralatan penyaman udara menggunakan HCFC yang berkuasa 2.5 hp dan ke bawah (untuk penggunaan dalam Malaysia) Prohibit the manufacture, assembly and import of HCFC-based air-con equipment of 2.5hp and below (for use in Malaysia)
	Mewartakan HCFC sebagai bahan terkawal Include HCFCs as restricted gas
	Larangan ke atas pengimportan <i>polyol</i> yang mengandungi HCFC Prohibit import of pre-blended polyols with HCFCs
2020	Larangan membuat, memasang dan mengimport semua barangan dan peralatan yang menggunakan HCFC kecuali bagi penggunaan khas (<i>essential use</i>) Prohibit the manufacture, assembly and import of all products and equipment using HCFCs (except for essential uses)
	Larangan menggunakan HCFC 141b sebagai agen pengembang Prohibit the use of HCFC 141b as blowing agent
	Larangan pembuatan dan pemasangan baru sistem pemadam api yang menggunakan HCFC Prohibit the use of HCFC in the manufacturing and installation of new fire extinguishing systems



TAHUN YEAR	POLISI DAN TINDAKAN PERUNDANGAN POLICIES AND REGULATORY ACTIONS
2025	Larangan pemasangan baru semua barangan dan peralatan yang menggunakan HCFC No more new installation of products and equipment using HCFCs
2030	Pemberian AP terhadap kepada 2.5% daripada jumlah <i>baseline</i> dan hanya untuk sektor perkhidmatansahaja AP limited to 2.5% of baseline and for servicing use only
2040	Larangan mutlak pengimportan HCFC mulai 1 Januari 2040 Total ban on the import and use of HCFCs.



Rajah 4.5 : Jadual Penghapusan HCFC
Figure 4.5 : HCFC Phase Out Schedule Consumption



Rajah 4.6 : Tren Penggunaan HCFC di Malaysia, 1996–2018
Figure 4.6 : HCFC Consumption Trend in Malaysia, 1996–2018

Pelan Pengurusan Penghapusan HCFC (HPMP)

Pada 25 Mac 2011, Kabinet telah meluluskan strategi Pelan Pengurusan Penghapusan HCFC (HPMP). Malaysia telah menerima bantuan kewangan sejumlah USD 9,587,470 bagi pelaksanaan HPMP Peringkat 1 dari Tabung Multilateral Protokol Montreal (MLF). Pada Mesyuarat ke 77 *Executive Committee (ExCOM) for the Implementation of Montreal Protocol* yang telah diadakan pada 3 November 2016, mesyuarat telah meluluskan

The HCFC Phase-out Management Plan (HPMP)

On March 21, 2011, the Cabinet approved the HCFC Phase-Out Management Plan (HPMP) strategy. Malaysia received financial assistance amounting to USD 9,587,470 for the implementation of HPMP Stage 1 from the Montreal Protocol Multilateral Fund (MLF). At the 77th Executive Committee Meeting (ExCOM) for the Implementation of the



Pelan Pengurusan Penghapusan HCFC Peringkat II berjumlah sebanyak USD 6,138,063 bagi penghapusan 146.24 ODP Tan HCFC. Pelan HPMP Peringkat II ini telah diluluskan bagi projek-projek termasuk penukaran teknologi kepada ODP sifar dan rendah GWP kepada enam puluh tujuh (67) industri kecil dan sederhana dari sektor busa, latihan juruteknik servis dan projek-projek bantuan teknikal dalam sektor penyejukbekuan dan penyamanan udara.

Pelaksanaan Pelan HPMP Peringkat II ini adalah dari tahun 2017 sehingga 2022. Tumpuan pada dua tahun pertama 2017 – 2019 diberikan terhadap sepuluh (10) industri busa yang menggunakan lebih dari 20 MT HCFC 141b bagi penghapusan dalam sektor busa manakala lima puluh tujuh (57) industri busa kecil dan sederhana yang lain diberi peluang terus menggunakan HCFC 141b sehingga tahun 2022. Ini bertujuan memberi peluang kepada pihak industri memilih alternatif yang bersifat sifar ODP serta rendah GWP selain kos yang kompetitif dan teknologi yang boleh diterima pakai digunakan apabila ianya tersedia di pasaran.

Manakala, bagi projek di bawah sektor penyejukbekuan dan penyamanan udara (RACs), enam (6) siri jelajah *Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management* di Shah Alam iaitu pada 14 Januari 2018, Kuantan, Pahang pada 21 Januari 2018, Seberang Jaya, Pulau Pinang pada 28 Januari 2018, Johor Bahru pada 4 Februari 2018, Kuching, Sarawak pada 25 Februari 2018, Kota Kinabalu, Sabah pada 4 Mac 2018 telah diadakan. Siri jelajah ini adalah bertujuan memberi maklumat mengenai perkembangan terkini pengurusan refrigeran dalam sektor (MAC) selain mempromosikan aktiviti reklamasi dan kitar semula refrigeran. Komitmen negara di bawah Pelan ini juga diteruskan dengan memperkasakan *Authorised*

Montreal Protocol held on 3 November 2016 approved the HPMP Stage II for a total of USD 6,138,063 for the phase-out of 146.24 ODP Ton HCFC. HPMP Stage 2 Plan has been approved for projects including the conversion technology of zero ODP dan low GWP to 67 small and medium industries from the foam sector, service technician training and technical assistance projects in the refrigeration and air-conditioning sector.

The Implementation of the Stage II HPMP Plan is from 2017 to 2022. The focus during the first two (2) years implementation are to the ten (10) foam industries using more than 20 MT HCFC 141b for the phase – out of HCFC 141b in the foam sector. While the other fifty-seven (57) small and medium foam industries (SMEs) will continue using HCFC 141b until 2022. This is to allow the industries to choose alternatives that are zero ODP and low GWP as well as competitive costs and acceptable technologies when there are available in the market.

Under the Refrigeration and Air Conditioning Sector's project, a roadshow consist of six (6) series of *Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management* were held in Shah Alam on 14th January 2018, Seberang Jaya, Pulau Pinang on 28th January 2018, Johor Bahru on 4th February 2018, Kuching, Sarawak on 25th February 2018 and Kota Kinabalu, Sabah on 4th March 2018. The roadshows aims to introduce and inform on the updates of refrigerant management besides promoting the reclamation and recycle activities. The commitment continues by upgrading selected *Authorised Training Centre (ATC) UniKL & ILP KB as Centre of Excellence (COE)* by equipping with flammable equipments. While

Training Centre (ATC) terpilih iaitu UNIKL, Bangi dan Institut Latihan Perindustrian Kepala Batas dengan menaiktaraf pusat tersebut sebagai *Centre of Excellence* dengan melengkapkannya dengan peralatan-peralatan bersifat mudah terbakar. Bagi meneruskan kesinambungan pelaksanaan *Certified Service Technician Programme (CSTP)*, lima puluh satu (51) Pusat Latihan Bertauliah (ATC) lain yang terdapat diseluruh negara telah dilengkapi dengan peralatan penyaman udara R32 yang bersifat *mildly flammable* dan set mesin perolehan dan kitar semula refrigeran.

for the other fifty-one (51) Authorized Training Centres are equipped with the mildly flammable R32 air-conditioning equipments and refrigerant recovery & recycle sets.

Pada mesyuarat EXCOM ke 82 pada 3-7 Disember 2018, mesyuarat telah mengambil maklum bahawa Malaysia telah melengkapkan Pelan Pengurusan Penghapusan HCFC (HPMP) Peringkat 1 dengan penghapusan *Ozone Depleting Potential Tonne (ODPT)* sebanyak 111.85.

During the 82nd EXCOM meeting that was held on 3rd – 7th December 2018, the meeting took note that Malaysia has completed the HCFC Phase-Out Management Plan (HPMP) Stage 1 by phasing out Ozone Depleting Potential Tonne (ODPT) 111.85.



Jelajah Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management di Shah Alam
Roadshows on Refresher Course For Technicians In Mobile Air Conditioner Sector (Mac) And Reclamation In Refrigerant Management at Shah Alam



Enabling Activities On Kigali Amendment

Bagi tujuan meratifikasikan Pindaan Kigali, pihak Tabung Pelbagai Hala (MLF) melalui Bank Dunia sebagai *Implementing Agency (IA)* telah meluluskan peruntukan sebanyak USD 250,000 bagi menjalankan aktiviti-aktiviti ke arah meratifikasi pindaan tersebut. Sebanyak tiga (3) siri *Stakeholders Consultation Workshop For The Ratification Of Kigali Amendment And Enabling Activities For HFC Phase Down Under The Montreal Protocol* telah diadakan di Sabah pada 5 Mac 2018, Sarawak pada 7 Mac 2018 dan Putrajaya pada 8 Mac 2018.

Dibawah komponen pengurusan, koordinasi dan kerjasama, JAS telah bekerjasama dengan Jabatan Kastam DiRaja Malaysia untuk mengadakan Kursus Kawalan Bahan Pemusnah Ozon pada 25 hingga 28 Mac 2018 di Seberang Jaya, Pulau Pinang. Kursus yang telah dihadiri oleh tiga puluh tujuh (37) pegawai penguatkuasa Jabatan Kastam DiRaja Malaysia dan lapan (8) pegawai Jabatan Alam Sekitar. Program ini diadakan bagi memberi maklumat kepada penguatkuasa JKDM dan JAS berkaitan pelaksanaan dan pematuhan terhadap Protokol Montreal, peraturan-peraturan bagi mengawal dan mengawasi pengimportan/pengeksportan bahan pemusnah ozon. Selain itu juga lawatan ke pelabuhan berdekatan turut diadakan sebagai pendedahan mengenai tatacara kerja pengimportan/pengeksportan bahan pemusnah ozon di lapangan.

Enabling Activities On Kigali Amendment

For the fast start of Kigali Amendment ratification, The Multilateral Fund (MLF) through The World Bank as the Implementing Partner (IA) has approved USD 250,000 for enabling activities. Three (3) series of seminar on Stakeholders Consultation Workshop For The Ratification Of Kigali Amendment And Enabling Activities For HFC Phase Down Under The Montreal Protocol was held in Sabah on 5th March 2018, Sarawak on 7th March 2018 and Putrajaya on 8th March 2018.

Under the cooperation, coordination and management components, DOE collaborated with the Malaysia Royal Customs Department in organizing a Customs Training On Ozone Depleting Substances (ODS) course held on 25th to 28th March 2018 at Seberang Jaya, Pulau Pinang. Thirty-seven (37) Malaysia Royal Customs Department and eight (8) Department of Environment enforcement officers attended the course. This program was organized to disseminate information to the enforcement officers on the implementation and compliance towards the Montreal Protocol, related regulations for controlling and monitoring importation/exportation of the ozone depleting substances. A visit to the nearest port was organized to expose the participants on the import export procedures at the point of entry.



Kursus Kawalan Bahan Pemusnah Ozon bagi Pegawai Penguatkuasa dari JKDM dan JAS.
Customs Training Programme On Ozone Depleting Substances (ODS), for Enforcement Officer from RMCD and DOE.

Pengurusan Halon

JAS dengan kerjasama Jabatan Bomba dan Penyelamat Malaysia telah mengadakan Seminar *Halon Management and Safety Standard for Flammable Refrigerants: Code of Practice* di enam (6) lokasi berlainan iaitu Kuala Lumpur pada 4 April 2018, Kota Kinabalu pada 11 April 2018, Sarawak pada 12 April 2018, Kuala Terengganu pada 17 April 2018, Johor Bahru pada 19 April 2018 dan Sungai Petani pada 10 Mei 2018. Seramai satu ribu dua ratus (1,200) orang pegawai Bomba telah menyertainya selain dari industri yang terlibat dalam sektor pemadaman dan agensi-agensi kerajaan. Jumlah pengumpulan gas halon sehingga tahun 2018 adalah sebanyak 7,144 kg Halon 1,211 dan 86,028.40 kg Halon 1,301 dan disimpan di Bank Halon Malaysia yang terletak di PUSPEK (Pusat Penyelidikan Kebommbaan), Jabatan Bomba dan Penyelamat Malaysia, Bandar Enstek, Nilai, Negeri Sembilan.

Halon Management

DOE Malaysia together with the Fire and Resque Department of Malaysia collaborated in organising the Halon Management and Safety Standard for Flammable Refrigerants: Code of Practice seminar at six (6) different locations, Kuala Lumpur on 4th April 2018, Kota Kinabalu on 11th April 2018, Sarawak on 12th April 2018, Kuala Terengganu on 17th April 2018, Johor Bahru on 19th April 2018 and Sungai Petani on 10th May 2018. One thousand two hundred (1,200) Fire and Resque Department of Malaysia officers had attended the seminar apart from other government agencies and firefighting sector industries. As of 2018, 7,144 kg Halon 1,211 and 86,028.40 kg Halon 1,301 were collected and stored at the Malaysia Halon Bank in PUSPEK (Pusat Penyelidikan Kebommbaan), Fire and Resque Department of Malaysia, Bandar Enstek, Nilai, Negeri Sembilan.





Seminar Halon Management and Safety Standard for Flammable Refrigerants: Code of Practice yang diadakan pada 4 April 2018

Halon Management and Safety Standard for Flammable Refrigerants: Code of Practice seminar on 4 April 2018

Program Pentaualiahan Juruteknik Servis (CSTP) Bagi Sektor Penyejukbekuan dan Penyaman Udara (RACs)

Pentaualiahan kepada juruteknik atau pengendali servis sektor refrigeran merupakan salah satu keperluan di dalam Peraturan-Peraturan Kualiti Alam Sekeliling (Pengurusan Refrigeran) 1999. Sektor servis refrigeran merupakan penyumbang utama kepada penggunaan HCFC dalam negara. Sehubungan itu, Jabatan Alam Sekitar melalui Pusat Latihan Bertauliah (ATC) yang terdiri daripada institut latihan awam dan swasta menganjurkan siri latihan CSTP khusus kepada juruteknik sektor ini mengenai pematuhan terhadap Protokol Montreal. Penekanan terhadap tatacara dan kod etika yang betul di dalam pengendalian refrigeran juga diberikan semasa sesi latihan sebagai usaha untuk mengelakkan pelepasan refrigeran ke persekitaran secara sengaja ataupun tidak sengaja.

Certified Service Technician Program (CSTP) for Refrigeration and Air-Conditioning Sectors (RACs)

Certification to technicians or the person handling refrigerants in service sector is one of the requirements under the Environmental Quality Act (Refrigerant Management) 1999. The Department of Environment Malaysia through the appointed Authorized Training Centre (ATC) which consists of the government and private training institutes organized series of certification training program for the technicians in this sector. The certification training program focuses on the country's obligation in Montreal Protocol and best practices in refrigerant management during servicing to prevent the release of refrigerant to the atmosphere.

Sepanjang tahun 2018, sebanyak dua ratus tujuh puluh tiga (273) siri latihan telah dijalankan oleh ATC untuk melatih dan mentauliahkan juruteknik-juruteknik atau pengendali sistem refrigeran selaras dengan kehendak Peraturan 5, Peraturan-Peraturan Kualiti Alam Sekeliling (Pengurusan Refrigeran) 1999. Seramai 2,996 orang Juruteknik telah mendaftar untuk mendapatkan pentaualiah dan 2,515 dari mereka telah lulus. Jabatan Alam Sekitar juga mengadakan lawatan audit ke ATC yang terpilih semasa mereka menjalankan latihan bagi memastikan sesi latihan dijalankan dengan lancar dan mematuhi kehendak Jabatan.

Di samping itu, Seksyen Perlindungan Ozon (SPO) Bahagian Udara, JAS telah menganjurkan satu Kursus *'Refresher Course For Master Trainers For Technicians In Refrigeration And Air Conditioning Servicing Sector Under HCFC Phaseout Management Plan (HPMP) Stage 1* untuk tenaga pengajar (Master Trainer) dari ATC telah diadakan pada 23 hingga 26 April 2018 di Holiday Inn Melaka yang bertujuan untuk memberi fokus kepada *'Training Manual For Technician In Refrigeration & Air-Conditioning Servicing Sector (RACs)'* yang telah dikemaskini serta pendedahan mengenai refrigeran alternatif yang telah digunakan dalam industri pada masa kini.

Program dan Kempen Kesedaran

Sempena Sambutan Hari Ozon Sedunia yang disambut setiap 16 September, pengumuman khas mengenainya telah dibuat di empat (4) akhbar tempatan iaitu The Star, New Straits Times, Berita Harian & Utusan Malaysia dan turut dimuat naik ke dalam laman sesawang dan media sosial (Facebook dan Instagram) Jabatan & Kementerian. Hebahan mengenai sambutan Hari Ozon turut dikeluarkan di Stesen Nasional.FM.

In 2018, two hundred seven three (273) series of training had been organized by ATC to train the technicians and refrigerant handlers and certify them with regards to the requirement of Regulation 5, Environmental Quality (Refrigerant Management) Regulations 1999. A total of 2,996 Technicians have enrolled to get competency and 2,515 of them have certified. Department of Environment also did auditing on the selected ATCs to ensure that the CSTP program were handled thoroughly and comply with the Department's requirement. Department of Environment also did auditing on the selected ATCs to ensure that the CSTP program were handled smoothly and comply with the Department's requirement.

The Ozone Protection Section under the Air Division of the DOE had organized a Course *'Refresher Course For Master Trainers For Technicians In Refrigeration And Air Conditioning Servicing Sector Under HCFC Phaseout Management Plan (HPMP) Stage 1* for Master Trainer from ATC was held from 23rd to 26th April 2018 at Holiday Inn Melaka focusing on *'Training Manual For Technician In Refrigeration & Air-Conditioning Servicing Sector (RACs)'* which has been updated as well as exposed and inform on the alternative refrigerants that have been used in the industry today.

Awareness Programmes and Campaigns

In conjunction with the World Ozone Day Celebration on 16 September, special announcements were made through the four (4) local newspapers The Star, New Straits Times, Berita Harian & Utusan Malaysia and it was published on the Ministry & Department's websites and social media (Facebook and Instagram). There was also announcement about the celebration on Nasional.FM radio station.



Tema sambutan pada tahun ini adalah *'Keep Cool and Carry On'*. Majlis sambutan yang diadakan di Hotel Saujana, Kuala Lumpur pada 25 September 2018 telah disempurnakan oleh YBhg. Datuk Seri Dr. Mohd Azhar Bin Haji Yahaya, Ketua Setiausaha di Kementerian Tenaga, Sains, Teknologi, Alam Sekitar & Perubahan Iklim (MESTECC). Dibawah pelaksanaan Pelan Pengurusan Penghapusan HCFC (HPMP), Bengkel berkaitan Teknologi Alternatif dalam sektor Penyejukan dan Penyaman Udara dan Bengkel Keselamatan dan Alternatif bagi sektor Busa telah diadakan. Bengkel-bengkel tersebut diadakan bertujuan bagi memberi maklumat kepada industri dan pemegang taruh berkaitan pelaksanaan HPMP peringkat II dan komitmen negara terhadap penghapusan bahan HCFC.

The theme for 2018 celebration was *'Keep Cool and Carry On'*. The celebration was officiated by YBhg. Datuk Seri Dr. Mohd Azhar Bin Haji Yahaya, Secretary General for Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) at The Saujana, Kuala Lumpur on 25th September 2018. Under the HCFC Phase-out Management Plan (HPMP), Workshop on Recycle and Reclaim of Refrigerants and the Emerging Alternatives In The Market and Workshop on Safety and Alternatives on Blowing Agent for Malaysian Industries in Foam were organized. The workshops aims in disseminating information to the stakeholders and industries on the implementation of the HPMP Stage 2 and the country commitments towards phasing out the HCFC.



Gimik pelancaran disempurnakan oleh YBhg. Datuk Seri Dr. Mohd Azhar Bin Haji Yahaya, Ketua Setiausaha di Kementerian Tenaga, Sains, Teknologi, Alam Sekitar & Perubahan Iklim (MESTECC). Gimmick for the launch of the ceremony officiated by the Secretary General of Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC), Datuk Seri Dr. Mohd Azhar Bin Haji Yahaya

Bagi merencanakan sambutan, pertandingan video dan mewarna turut diadakan kepada orang awam dan pelajar sekolah berdasarkan tema sambutan pada tahun ini iaitu *'Keep Cool and Carry On'*. Pameran berkonsepkan pelaksanaan Protokol Montreal dan alternatif terhadap bahan pemusnah ozon turut diadakan dan disertai oleh

To uplift the celebration, colouring contest and video making competition were organized for school children and the public. Exhibition on Montreal Protocol's implementation and the alternative to the ozone depleting substances was organised and participated by Department of Environment, PUSPEK (Pusat Penyelidikan Kebombaan), Fire

Jabatan Alam Sekitar, PUSPEK (Pusat Penyelidikan Kebombaan) dari Jabatan Bomba dan Penyelamat Malaysia dan pihak industri.

& Resque Department of Malaysia and industries.

Hari Ozon Antarabangsa yang diraikan pada 16 September ini tidak hanya dilaksanakan di peringkat Ibu Pejabat kerana pejabat-pejabat JAS Negeri turut sama menjayakan program kesedaran perlindungan lapisan ozon.

Not only celebrated by the DOE headquarter, the celebration continues to spread nationwide with the involvement of the DOE State offices conducting Ozone layer protection awareness programmes.

Acara Pertandingan Mewarna Kanak-Kanak merupakan antara aktiviti yang diadakan semasa majlis Sambutan Hari Ozon Sedunia 2018. Colouring contest was one of the children's activities at the World Ozone Day Celebration 2018.



YBhg. Datuk Seri Dr. Mohd Azhar Bin Haji Yahaya, Ketua Setiausaha di Kementerian Tenaga, Sains, Teknologi, Alam Sekitar & Perubahan Iklim (MESTECC) dan YBrs. Dato' Dr Ahmad Kamarulnajib Bin Che Ibrahim, Ketua Pengarah Jabatan Alam Sekitar Malaysia bersama para pemenang pertandingan rekacipta video dan pertandingan mewarna. YBhg. Datuk Seri Dr. Mohd Azhar Bin Haji Yahaya, Secretary General, Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) & YBrs. Dato' Dr Ahmad Kamarulnajib Bin Che Ibrahim, Director General of Environment, Malaysia together with the winners of video competition and colouring contest.





Pameran Semasa Majlis Sambutan Hari Ozon Sedunia 2018
Exhibitions during the World Ozone Day 2018

SAMBUTAN HARI OZON SEDUNIA 2018

Lapisan ozon yang berada di atmosfera bumi merupakan lapisan penting bagi melindungi hidupan di muka bumi daripada sinaran ultraungu (UV) yang boleh memudaratkan. Kesan terhadap penipisan ozon boleh menyebabkan kanser kulit, katarak serta gangguan terhadap rantai makanan.

Bahan-bahan pemusnah lapisan ozon adalah seperti Klorofluorokarbon (CFC), Halon, Karbontetraklorida (CTC), Metil Bromida (MBR) dan Hidroklorofluorokarbon (HCFC). Bahan pemusnah ozon ini banyak digunakan dalam peralatan penghawa dingin dan peti sejuk.

Masyarakat antarabangsa dari 197 negara Parti kepada Protokol Montreal akan menyambut Hari Ozon Antarabangsa pada 16 September setiap tahun. Tema Sambutan Hari Ozon Sedunia pada tahun ini iaitu "Keep Cool and Carry On: The Montreal Protocol", bermaksud meneruskan usaha-usaha dalam melindungi lapisan ozon bagi memperlahankan kesan perubahan iklim serta mengekalkan kehidupan yang selesa dan lestari.

50 to 80 km

ground to 16 km (10 miles)

NATURAL OZONE LAYER

Clouds limit Mount Everest

KEEP COOL AND CARRY ON
THE MONTREAL PROTOCOL

WORLD OZONE DAY

www.doe.gov.my

Pengumuman Khas Sempena Hari Ozon Sedunia pada 16 September 2018
Special announcement in conjunction with World Ozone Day on September 16, 2018

Jadual 4.22 : Aktiviti Latihan & Kesedaran
Table 4.22 : Training and Awareness Activities

TARIKH DATE	AKTIVITI ACTIVITIES	TEMPAT PLACE
14 Januari 2018	Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management	The Saujana Resort, Kuala Lumpur
21 Januari 2018	Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management	The Zenith Hotel, Kuantan
28 Januari 2018	Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management	The Light Hotel, Penang
4 Februari 2018	Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management	Thistle Hotel, JB
6 Februari 2018	Seminar Refrigerant Phase Out: Way Forward In Malaysia 2018	Thistle Hotel, JB
25 Februari 2018	Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management	Hilton Hotel, Kuching
4 Mac 2018	Refresher Course For Technicians In Mobile Air Conditioner Sector (MAC) And Reclamation In Refrigerant Management	Sutera Harbour Resort, Sabah
5 Mac 2018	Stakeholders Consultation Workshop For The Ratification Of Kigali Amendment And Enabling Activities For HFC Phase Down Under The Montreal Protocol	Pacific Sutera Hotel, Sabah
7 Mac 2018	Stakeholders Consultation Workshop For The Ratification Of Kigali Amendment And Enabling Activities For HFC Phase Down Under The Montreal Protocol	Hilton Hotel, Kuching
8 Mac 2018	Stakeholders Consultation Workshop For The Ratification Of Kigali Amendment And Enabling Activities For HFC Phase Down Under The Montreal Protocol	Marriott Hotel, Putrajaya
25 hingga 28 Mac 2018	Kursus Kawalan Bahan Pemusnah Ozon Siri 1/2018	The Light Hotel, Penang
4 April 2018	Seminar Pengurusan Halon Dan MS:2678:2017 Flammable Refrigerant System - Code Of Practice	Palace Of The Golden Horses, Seri Kembangan
11 April 2018	Seminar Pengurusan Halon Dan MS:2678:2017 Flammable Refrigerant System - Code Of Practice	Promenade Hotel, Sabah
12 April 2018	Seminar Pengurusan Halon Dan MS:2678:2017 Flammable Refrigerant System - Code Of Practice	Hilton Hotel, Kuching
17 April 2018	Seminar Pengurusan Halon Dan MS:2678:2017 Flammable Refrigerant System - Code Of Practice	Primula Beach Hotel, Terengganu



TARIKH DATE	AKTIVITI ACTIVITIES	TEMPAT PLACE
19 April 2018	Seminar Pengurusan Halon Dan MS:2678:2017 Flammable Refrigerant System – Code Of Practice	KSL Hotel & Resort, JB
23 hingga 26 April 2018	Refresher Course For Master Trainers For Technicians In Refrigeration And Air Conditioning Servicing Sector Under HCFC Phase-out Management Plan (HPMP) Stage 1	Holiday Inn, Melaka
10 Mei 2018	Seminar Pengurusan Halon Dan MS:2678:2017 Flammable Refrigerant System – Code Of Practice	The Pure Hotel, Sungai Petani
19 Julai 2018	ASEAN Premier Electrical And Mechanical Engineering Show	KLCC, Kuala Lumpur
25 September 2018	Sambutan Hari Ozon Sedunia 2018	The Saujana Hotel, Kuala Lumpur
17 hingga 20 Oktober 2018	International Greentech & Eco Products Exhibition & Conference Malaysia (IGEM 2018)	KLCC, Kuala Lumpur
29 November 2018	Seminar On Recovery And Reclamation Of Fluorocarbons For Protection Of Ozone Layer And Mitigation Of Global Warming	Putrajaya
6 Disember 2018	Seminar On Montreal Protocol (Kigali Amendment)	Wisma FMM, Kuala Lumpur
10 hingga 14 Disember 2018	Bengkel Dan Mesyuarat Pindaan Modul / Kit Latihan Dan Peperiksaan Bagi Program Persijilan Juruteknik Sektor Penyejukbekuan Dan Penyamanan Udara	Hatten Hotel, Melaka

Jadual 4.23 : Mesyuarat – Mesyuarat dan Latihan Peringkat Serantau dan Antarabangsa
Table 4.23 : Regional and International Meetings and Trainings

TARIKH DATE	AKTIVITI ACTIVITIES	TEMPAT PLACE
15 hingga 19 Januari 2018	Inter Regional Thematic & Network Meetings	Paris, France
22 Februari hingga 2 Mac 2018	Hands On Training Under Refrigerant And Air Conditioning (RAC) Sector : Study Tour To Daikin Training Centre	Osaka, Japan
12 hingga 16 Mac 2018	Technical Assistance To Small And Medium Enterprises Under HPMP–Study Tour To China	China
8 hingga 10 April 2018	Joint Meeting Of National Ozone Offices Networks Of South Asia, South-East Asia, And West Asia, Back-To-Back With The Ozone2climate Industry Roadshow	Beijing, China
11 hingga 12 April 2018	Twinning Workshop On Energy-Efficient Refrigeration And Air-Conditioning	Beijing, China
18 hingga 22 Jun 2018	81 st Meeting Of The Executive Committee	Montreal, Canada

TARIKH DATE	AKTIVITI ACTIVITIES	TEMPAT PLACE
9 hingga 10 Julai 2018	Workshop On Energy Efficiency While Phasing Down HFCS	Vienna
4 September 2018	ATMOSphere Asia Conference 2018	Singapore
8 hingga 10 Oktober 2018	The Green Supply Chain Workshop for Cooling Without Warming	Jakarta, Indonesia
17 hingga 19 Oktober 2018	National Ozone Unit and Customs Twinning Workshop & Border Dialogues for Countries of South Asia and South-East Asia Networks	Bangkok, Thailand
4 hingga 8 November 2018	The 30 th Meeting Of The Parties To The Montreal Protocol On Substances That Deplete The Ozone Layer	Quito, Ecuador
5 hingga 7 Disember 2018	13 th International Symposium On New Refrigerants And Environmental Technology 2018	Tokyo, Japan



Pembukaan Rasmi Mesyuarat ke 30 Parti kepada Protokol Montreal oleh Presiden Republik Equador yang telah diadakan pada 4 hingga 8 November 2018 di Quito, Ecuador.

Official Opening of the 30th Meeting of Parties to the Montreal Protocol by the President Republic of Ecuador held from 4 to 8 November 2018 in Quito, Ecuador.

Pegawai Seksyen Perlindungan Ozon Semasa Di Mesyuarat Ke 30 Parti Kepada Protokol Montreal yang telah diadakan pada 4 hingga 8 November 2018 di Quito, Ecuador.

National Ozone Unit Officers during the 30th Meeting of Parties to the Montreal Protocol held from 4 to 8 November 2018 in Quito, Ecuador.



PROGRAM PENCEGAHAN KEBAKARAN TANAH GAMBUS BAGI MENGATASI JEREBU

Pengurusan tanah gambut yang lestari adalah sangat penting bagi mencegah berlakunya pembakaran terbuka tanah gambut yang boleh menyebabkan jerebu setempat. Pembinaan sekatan saluran (*check dams*) dan telaga tiub, kolam takungan air dan pemasangan paip saluran air telah dikenalpasti sebagai kaedah pengurusan air di tanah gambut yang berkesan untuk mencegah dan mengawal pembakaran terbuka.

Program ini melibatkan kerjasama erat pelbagai agensi iaitu Jabatan Alam Sekitar (JAS), Jabatan Pengairan dan Saliran (JPS), Jabatan Mineral dan Geosains (JMG), Jabatan Perhutanan Negeri Selangor, Jabatan Perhutanan Negeri Sabah dan Majlis Bandaraya Miri (MBM). Projek ini telah dilaksanakan di tujuh (7) buah negeri iaitu Johor, Pahang, Selangor, Kelantan, Sarawak, Sabah dan Terengganu. Projek ini merangkumi aktiviti-aktiviti seperti pembinaan sekatan saluran (*check dam*) berjumlah 316 buah iaitu Pahang (83), Johor (80), Terengganu (46), Sarawak (37), Kelantan (35), Selangor (23) dan Sabah (12). Di samping itu juga, sebanyak 85 buah telaga air tanah telah dibina iaitu Sarawak (15), Pahang (15), Johor (14), Kelantan (13), Selangor (13), Sabah (9) dan Terengganu (6). Manakala sebanyak lima (5) buah menara tinjau telah dibina untuk digunakan bagi pemantauan pembakaran terbuka pada musim panas dan kering iaitu masing-masing di Selangor, Pahang, Sarawak dan Sabah. Selain daripada itu adalah pembinaan dua (2) buah kolam takungan di Hutan Simpan Raja Musa, Kuala Selangor.

PEAT LAND FIRE PREVENTION PROGRAM

Sustainable management of peatlands is very important to prevent burning or fire on peatlands which can cause localized haze. Construction of canal blocks (*check dams*), tube wells, retention pond and water pipe has been identified as effective methods for water management in peatlands to prevent and control open burning.

The program involves various agencies, which are Department of Environment (DOE), Department of Irrigation and Drainage (DID), Minerals and Geoscience Department (MGD), Selangor Forestry Department, Sabah Forestry Department and Miri City Council (MCC). The project has been implemented in seven (7) states which include Johor, Pahang, Selangor, Kelantan, Sarawak, Sabah and Terengganu. The project includes construction of 316 check dams namely Pahang (83), Johor (80), Terengganu (46), Sarawak (37), Kelantan (35), Selangor (23) and Sabah (12). In addition, a total of 85 tube wells were constructed namely Sarawak (15), Pahang (15), Johor (14), Kelantan (13), Selangor (13), Sabah (9) and Terengganu (6). A total of five (5) watch towers were also constructed to monitor open burning especially during the dry season namely Selangor, Pahang, Sarawak and Sabah. Other than that, two (2) water ponds were constructed at Raja Musa Forest Reserve, Kuala Selangor.

Bagi tahun 2018, sebanyak 32 buah sekatan saluran dibina di negeri Pahang (13), Terengganu (10), Kelantan (7) dan Sabah (2). Untuk telaga tiub, sebanyak 8 buah telaga telah dibina di negeri Selangor (2), Terengganu (2), Kelantan (2), Johor (1) dan Pahang (1) dan 2 kolam takungan di negeri Selangor telah dibina merangkumi peruntukan sebanyak RM5,970,000.00.

In 2018, a total of RM5,970,000.00 was spent to construct 32 check dams in the states of Pahang (13), Terengganu (10), Kelantan (7) and Sabah (2). For tube well, 8 tube wells were constructed in the states of Selangor (2), Terengganu (2), Kelantan (2), Johor (1) and Pahang (1) and 2 retention ponds were constructed in the state of Selangor.



Sekatan saluran di Bachok, Kelantan
Check dams in Bachok, Kelantan



Kombinasi menara tinjau, telaga air tanah, sekatan saluran dan papan tanda larangan pembakaran terbuka di Kuala Langat, Selangor
Combination of tube well. Check dam, watch tower and open burning prohibited sign at Kuala Langat, Selangor





Kolam Takungan
di Pekan, Pahang
Water Pond in
Pekan, Pahang



Menara tinjau di Kuantan, Pahang
Watch tower in Kuantan, Pahang



Telaga Tiub di Dungun, Terengganu
Tube Well in Dungun, Terengganu



Paip Saluran Air di Hutan Simpan Raja Musa, Kuala Selangor, Selangor bagi meningkatkan paras air gambut
Water Piping in Raja Musa Forest Reserve, Batang Berjuntai, Selangor to raise peat land water level



PENGURUSAN BUANGAN TERJADUAL

Lesen Premis yang Ditetapkan

Sejumlah 736 lesen dikeluarkan kepada kemudahan baru dan sedia ada pada tahun 2018 yang terdiri daripada 178 kemudahan pemerolehan kembali luar tapak bukan e-waste, 27 kemudahan pemerolehan kembali penuh luar tapak bagi e-waste, 94 kemudahan pemerolehan kembali separa luar tapak bagi e-waste, 37 kemudahan penunu buangan terjadual, 1 kemudahan buangan terjadual di tanah, 4 kemudahan pengolahan luar tapak, 6 kemudahan tapak pelupusan selamat, dan 53 kemudahan penstoran luar tapak. Sejumlah 336 lesen dikeluarkan kepada pembawa yang ditetapkan. **(Jadual 4.24)**

SCHEDULED WASTE MANAGEMENT

Licences for Prescribed Premises

A total number of 736 licenses were issued for both existing and new facilities in 2018 which consists of 178 licenses for off-site recovery (non e-waste), 27 licenses for off-site full recovery plants (e-waste), 94 licenses for off-site partial recovery plants (e-waste), 37 licenses for scheduled wastes incinerators, 1 license for land treatment, 4 licenses for off-site treatment, 6 licenses for secured landfills and 53 licenses for off-site storage facilities. A total of 336 licenses were issued for prescribed conveyance. **(Table 4.24)**



Jadual 4.24 : Lesen-Lesen yang Dikeluarkan Bagi Kemudahan Pemeroletan Kembali, Pengolahan dan Pelupusan Buangan Terjadual yang Diluluskan Oleh Jabatan Alam Sekitar, 2018

Table 4.24 : Licences Issued for Recovery Facilities Processing Wastes Disposal Approved by The Department of The Environment, 2018

BIL	KEMUDAHAN	JUMLAH LESEN DIKELUARKAN MENGIKUT NEGERI															JUMLAH
		JHR	KDH	KLN	MLK	N.S	PHG	PRK	PRS	PP	SBH	SRK	SLG	TRG	WP (KL)	WP (LAB)	
1	Pembawa Yang Ditetapkan / Prescribed Conveyance	61	20	3	21	18	5	25	1	45	12	32	78	4	5	6	336
	Penstoran Luar Tapak / Off Site Storage	5	1	3	1	2	1	2	0	0	7	21	3	1	0	6	53
Pemerolehan Kembali Luar Tapak / Off Site Recovery																	
2	a. Pemerolehan Kembali Luar Tapak bukan e-Waste Off Site Recovery (none e-waste)	36	8	0	4	14	7	20	1	19	3	4	55	5	0	2	178
	b. Pemerolehan Kembali Penuh Luar Tapak bagi e-Waste / Off Site Full Recovery for e-Waste	1	3	0	5	3	0	3	0	9	0	1	2	0	0	0	27
	c. Pemerolehan Kembali Separa Luar Tapak bagi e-Waste / Off Site Partial Recovery for e-Waste	19	8	0	10	4	0	1	0	17	1	5	21	2	5	1	94
3	Penunu Buangan Terjadual / Schedule Waste Incinerator	6	1	0	0	3	1	4	0	3	2	12	2	2	0	1	37
4	Pengolahan Di Tanah / Land Treatment Facilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5	Pengolahan Luar Tapak / Off Site Treatment Facilities	1	0	0	1	0	0	0	0	0	1	0	0	0	0	1	4
6	Tapak Pelupusan Selamat / Secured Landfill	1	1	0	0	2	0	0	0	0	0	1	0	1	0	0	6
Bil. Lesen / No. of License		130	42	6	42	46	14	55	2	93	26	76	161	15	10	18	736
Bil. Premis / No. of Premises		69	22	3	21	18	9	30	1	48	14	44	83	11	5	12	390

NOTA / NOTE

JHR - JOHOR
KDH - KEDAH
KLN - KELANTAN
MLK - MELAKA
N.S - NEGERI SEMBILAN
PRK - PERAK
PRS - PERLIS
PP - PULAU PINANG
PHG - PAHANG
SBH - SABAH

SLG - SELANGOR
SRK - SARAWAK
TRG - TERENGGANU
WP (KL) - WILAYAH PERSEKUTUAN KUALA LUMPUR
WP (LAB) - WILAYAH PERSEKUTUAN LABUAN



KENDERAAN BERMOTOR

Sehingga akhir tahun 2018, sebanyak 29,956,525 buah kenderaan bermotor telah berdaftar di Malaysia, iaitu pertambahan sebanyak 1,218,331 buah kenderaan (4.24%) berbanding tahun 2017. Pecahan keseluruhan kenderaan bermotor yang berdaftar mengikut jenis kenderaan adalah seperti di **Rajah 4.7**.

Dari sejumlah 1,218,331 buah kenderaan baru yang didaftarkan dalam tahun 2018, kategori kereta merupakan yang tertinggi iaitu sebanyak 608,417 unit (49.77%) diikuti motosikal sebanyak 552,888 unit (45.23%), manakala sebanyak 57,026 unit (5.00%) adalah dari lain-lain jenis kenderaan termasuk lori, bas, van dan sebagainya.

Taburan bilangan kenderaan bermotor di Malaysia mengikut negeri adalah seperti di **Rajah 4.8**. Wilayah Persekutuan Kuala Lumpur mendahului negeri-negeri lain dengan mempunyai bilangan kenderaan yang tertinggi iaitu sebanyak 6,553,527 unit (atau 21.88%) daripada keseluruhan bilangan kenderaan yang berdaftar di negara ini, diikuti oleh negeri Johor, Selangor, P. Pinang dan Perak.

Kawalan Pelepasan Asap dan Gas dari Kenderaan Bermotor

Pelepasan asap serta gas-gas pencemar seperti karbon monoksida (CO), hidrokarbon (HC), oksida-oksida nitrogen (NO_x) serta partikulat (PM) yang dilepaskan melalui ekzos kenderaan bermotor adalah dikawal di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Diesel) 1996 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Petrol) 1996.

MOTOR VEHICLES

As of end 2018, a total of 29,956,525 motor vehicles were registered in Malaysia, an increase of 1,218,331 units (4.24%) compared to 2017. The breakdown of the total registered vehicles according to vehicle types is given in **Figure 4.7**.

Out of 1,218,331 new vehicles registered in 2018, motorcars made up the highest number with 608,417 units (49.77%) followed by motorcycles 552,888 units (45.23%). The remaining 57,026 units (5.00%) were from other vehicle types such as lorries, buses, vans and others.

The distribution of registered vehicles throughout the states is given in **Figure 4.8**. The Federal Territory of Kuala Lumpur recorded the highest number of vehicles registered, with 6,553,527 units (or 21.88%) and followed by Johor, Selangor, P. Pinang and Perak.

Control of Smoke and Gaseous Emissions from Motor Vehicles

Emission of smoke and gaseous pollutants such as carbon monoxide (CO), hydrocarbons (HC), oxides of nitrogen (NO_x) and particulate matters (PM) emitted from motor vehicle exhausts are controlled under the Environmental Quality (Control of Emission from Diesel Engines) Regulations 1996 and the Environmental Quality (Control of Emission from Petrol Engines) Regulations 1996.

Kawalan Pelepasan Asap Hitam Dari Kenderaan Diesel

Kawalan pelepasan asap hitam berlebihan dari ekzos kenderaan diesel dipantau melalui operasi statik secara bersepadu dengan agensi penguatkuasa lain (JPJ dan Trafik Polis-PDRM), operasi pemerhatian melalui video kamera dan Program AWASI (*Area Watch And Sanction Inspection*). Melalui program ini, skuad peronda JAS akan menjalankan penguatkuasaan, rondaan, pemerhatian pelepasan asap hitam dari ekzos kenderaan dan memberhentikan kenderaan untuk menjalankan ujian asap ke atas kenderaan-kenderaan diesel yang diperhatikan mengeluarkan asap hitam berlebihan.

Tindakan kompaun akan diambil serta merta kepada pemandu dan tuan punya kenderaan yang didapati gagal mematuhi had pelepasan asap 50% kelegapan. Kompaun serta perintah larangan (larangan menggunakan kenderaan) akan dikeluarkan sekiranya kenderaan didapati melepaskan asap melebihi 70 % kelegapan.

Pada tahun 2018, sebanyak 4,336 program penguatkuasaan telah dilaksanakan di bandar-bandar di seluruh negara. Sejumlah 435,701 buah kenderaan diesel telah diperiksa secara visual. Dari jumlah tersebut, sebanyak 415 buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan asap hitam sebanyak 50% kelegapan. Manakala 235 kenderaan telah dikenakan perintah larangan beroperasi sehingga lulus ujian asap semula oleh JAS. Pada keseluruhannya, peratus pematuhan oleh kenderaan diesel adalah 98.89%. Ini adalah penurunan sebanyak 0.19% berbanding dengan tahun 2017.

Control of Black Smoke Emission From Diesel Vehicles

The control of excessive black smoke emission emitted from diesel vehicle exhausts is monitored through the curbside operation with others enforcement agencies (RTD and Police Traffic PDRM), camera video surveillance and the AWASI (*Area Watch And Sanction Inspection*) Programme. Through this programme the DOE's mobile squad would enforce, patrol the streets, observe the smoke emitted from the moving vehicles, stop and carry put testing for vehicles emitting excessive smoke.

Compounds were issued on-the-spot to the drivers and owners if their vehicles fail to comply with the stipulated smoke limit of 50% opacity. A prohibition order (prohibiting vehicle use) will be issued if the smoke limit exceeds 70% opacity.

In 2018, a total of 4,336 enforcement programmes were conducted in the cities throughout the country. A total of 435,701 diesel vehicles were visually inspected. Out of these, 415 vehicles were compounded for failing to comply with the 50% opacity smoke limit. 235 vehicles were issued the prohibition order until the undergo and passed smoke retest by the DOE. Generally, the percentage of compliance of diesel vehicles was 98.89%. There is a decrement of 0.19% compared to 2017.



Bilangan kenderaan diesel yang dikompaun dan peratus pematuhannya mengikut jenis kenderaan adalah seperti di **Rajah 4.9**. Bilangan kenderaan dikompaun, pengeluaran perintah larangan serta peratus pematuhan mengikut negeri adalah seperti di **Rajah 4.10**. Tindakan mahkamah telah juga diambil ke atas 22 pemandu serta pemilik kenderaan kerana gagal menjelaskan kompaun yang telah dikenakan. Sejumlah 2,783 kenderaan diesel juga telah diarahkan untuk menjalankan ujian semula di PUSPAKOM.

Kawalan Pelepasan Gas CO dan HC Dari Kenderaan Petrol

Sepanjang tahun 2018 sejumlah 492 buah kenderaan berenjin petrol telah diuji pelepasan CO dan HC dengan menggunakan meter gas CO-HC Analyzer melalui kaedah “ujian *idling*” di jalan raya. Dari jumlah ini, sebanyak 2 buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan yang ditetapkan. Peratus pematuhan keseluruhannya adalah 99.59% iaitu peningkatan sebanyak 0.85% berbanding dengan tahun 2017. Surat amaran juga telah dikeluarkan kepada pemandu-pemandu kenderaan yang gagal mematuhi had-had pelepasan CO dan HC supaya segera menyelenggara kenderaan bagi memastikan kenderaan sentiasa mematuhi had pelepasan yang ditetapkan oleh undang-undang.

Ujian Kelulusan Jenis (Kenderaan Petrol)

Malaysia telah memperkenalkan standard pelepasan pencemar untuk model baru kenderaan yang menggunakan petrol dengan tujuan memperbaiki pelepasan pencemar menggunakan rekabentuk enjin baru dan teknologi kawalan pelepasan.

The number of diesel vehicles compounded and their percentage of compliance according to vehicle types is given in **Figure 4.9**. The number of vehicles compounded, number of prohibition orders issued and the percentage of compliance according the states is given in **Figure 4.10**. Court actions were also taken against 22 drivers and vehicle owners for failing to settle the compounds issued. A total of 2,783 diesel vehicles were instructed to undergo smoke retest at PUSPAKOM.

Control of CO and HC Gas Emissions from Petrol Vehicles

In 2018, a total of 492 petrol engine vehicles were inspected using the CO-HC gas analyzer via the idling test method conducted at the road side. A total of 2 vehicles were compounded for failing to comply with the stipulated CO and HC limits. The overall percentage of compliance is 99.59% i.e. an increase of 0.85% compared to 2017. Warning letters were also issued to drivers for immediate servicing of their vehicles to ensure compliance to the emission limits stipulated in the law.

Type Approval Test (Petrol Vehicle)

Malaysia had established an exhaust emission standard for new petrol vehicles in order to improve exhaust emission by utilizing new engine design and emission control technology.

Mana-mana model baru kenderaan bermotor pada atau selepas 1 Januari 2000 adalah dikehendaki mematuhi standard pelepasan pencemar yang ditetapkan dalam Jadual Ketiga, Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Petrol), 1996 yang berdasarkan Arahan Majlis 94/12/EEC dan 93/59/EEC. Pada tahun 2018, Jabatan Alam Sekitar telah mengeluarkan 52 Sijil Ujian Kelulusan Jenis bagi model baru kenderaan petrol yang akan dipasarkan di Malaysia.

Ujian Kelulusan Jenis (Kenderaan Diesel)

Bagi mengawal pelepasan dari kenderaan berenjin diesel di Malaysia. Setiap model baru kenderaan bermotor pada atau selepas 1 Januari 1997 adalah dikehendaki mematuhi standard pelepasan pencemar yang ditetapkan dalam Jadual Kedua, Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Diesel), 1996 yang berdasarkan Peraturan No. 49.02 ECE dan Arahan Majlis 93/59/EEC. Pada tahun 2018, Jabatan Alam Sekitar telah mengeluarkan 45 Sijil Ujian Kelulusan Jenis bagi model baru kenderaan diesel yang akan dipasarkan di Malaysia.

Pengwujudan Kemudahan yang Diluluskan

Bagi memudahkan orang awam menghantar kenderaan mereka untuk menjalani ujian pelepasan asap dan gas, Jabatan Alam Sekitar melalui program “Kemudahan Yang Diluluskan (KYDL)” telah memberi pengiktirafan kepada bengkel-bengkel kenderaan yang memenuhi kriteria-kriteria yang telah ditetapkan. Kemudahan ini boleh bertindak sebagai pengujian segera

Any new model of motor vehicle that is commissioned on or after 1 January 2000 is required to comply with emission standards prescribed in the Third Schedule of the Environmental Quality (Control of Emission from Petrol Engines) Regulations, 1996 which is based on Council Directive 94/12/EEC and 93/59/EEC. In 2018, the Department of Environment has issued 52 Type Approval Test Certificates for new models of petrol vehicles to be marketed in Malaysia.

Type Approval Test (Diesel Vehicle)

To control emissions from diesel vehicles in Malaysia. Each new model of motor vehicle on or after January 1, 1997 is required to comply with emission standards prescribed in the Second Schedule, Environmental Quality (Control of Emission from Diesel Engines) Regulations, 1996, which is based on ECE Regulation No.49.02 and Council Directive 93/59/EEC. In 2018, the Department of Environment has issued 45 Certificate of Type Approval Test for the new model diesel vehicles to be marketed in Malaysia.

Establishment of Approved Testing Facilities

To facilitate convenient public access to workshops for smoke and gaseous emission testing, DOE accredited a number of workshops that fulfilled the prescribed criteria as “Approved Testing Facilities”. These testing facilities could also serve as immediate testing and repair centers for the non-complying



dan kenderaan yang tidak mematuhi diperbaiki di pusat-pusat ini supaya memastikan kenderaan sentiasa mematuhi had pelepasan asap.

Sehingga akhir tahun 2018, sejumlah 130 sijil pengiktirafan telah dikeluarkan kepada bengkel serta pusat-pusat pemeriksaan kenderaan di seluruh negara sebagai "Kemudahan Yang Diluluskan" oleh JAS.

Kawalan Pelepasan Gas Pencemar Daripada Motosikal

Mulai 1 Januari 2016 semua model baru motosikal adalah dikehendaki mematuhi standard EURO3 bagi pelepasan gas pencemar daripada motosikal yang berdasarkan *European Committee 97/24/EC amendments 2002/51/EC Chapter 5 ANNEX II sec. 2.2.1.1.5. of 19 July 2002* atau *World motorcycle emission test cycle "WMTC" under the European Committee ("EC") 2006/72/EC of 18 August 2006*. Pematuhan standard EURO3 bagi model sedia ada motosikal dimulakan pada 1 Januari 2017.

Pada tahun 2018, sebanyak 128 Sijil Kelulusan Jenis telah dikeluarkan kepada pembuat, pemasang dan pengimport motosikal untuk pasaran tempatan.

Bunyi Bising Kenderaan Bermotor

Pelepasan bunyi bising daripada kenderaan bermotor dikawal di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Bunyi Bising Kenderaan Bermotor) 1987.

Operasi penguatkuasaan bagi mengawal pelepasan bunyi bising dari motorsikal telah dilaksanakan oleh Pejabat-pejabat JAS negeri dengan kerjasama Polis Diraja Malaysia (Cawangan Trafik). Pada 2018, sejumlah 7,333 buah motosikal telah

vehicles, to ensure they are always in compliance with the emission limits stipulated.

By the end of 2018, a total of 130 certificates of accreditation were issued to the workshops and vehicle testing centers throughout the country as "Approved Testing Facilities" by DOE.

Control of Emission from Motorcycles

From 1 January 2016, all new models of motor motorcycles are required to comply with the standards EURO3 for gaseous emissions from motorcycles by referring to *European Committee 97/24/EC amendments 2002/51/EC Chapter 5 ANNEX II sec. 2.2.1.1.5. of 19 July 2002* or *World of motorcycle emission test cycle "WMTC" under the European Committee ("EC") 2006/72 / EC of 18 August 2006*. Compliance with the EURO3 emission standards for motorcycles existing model are started on 1 January 2017.

In 2018, a total of 128 Type Approval Test Certificates were issued to the manufacturers, assemblers and importers of motorcycles for the domestic market.

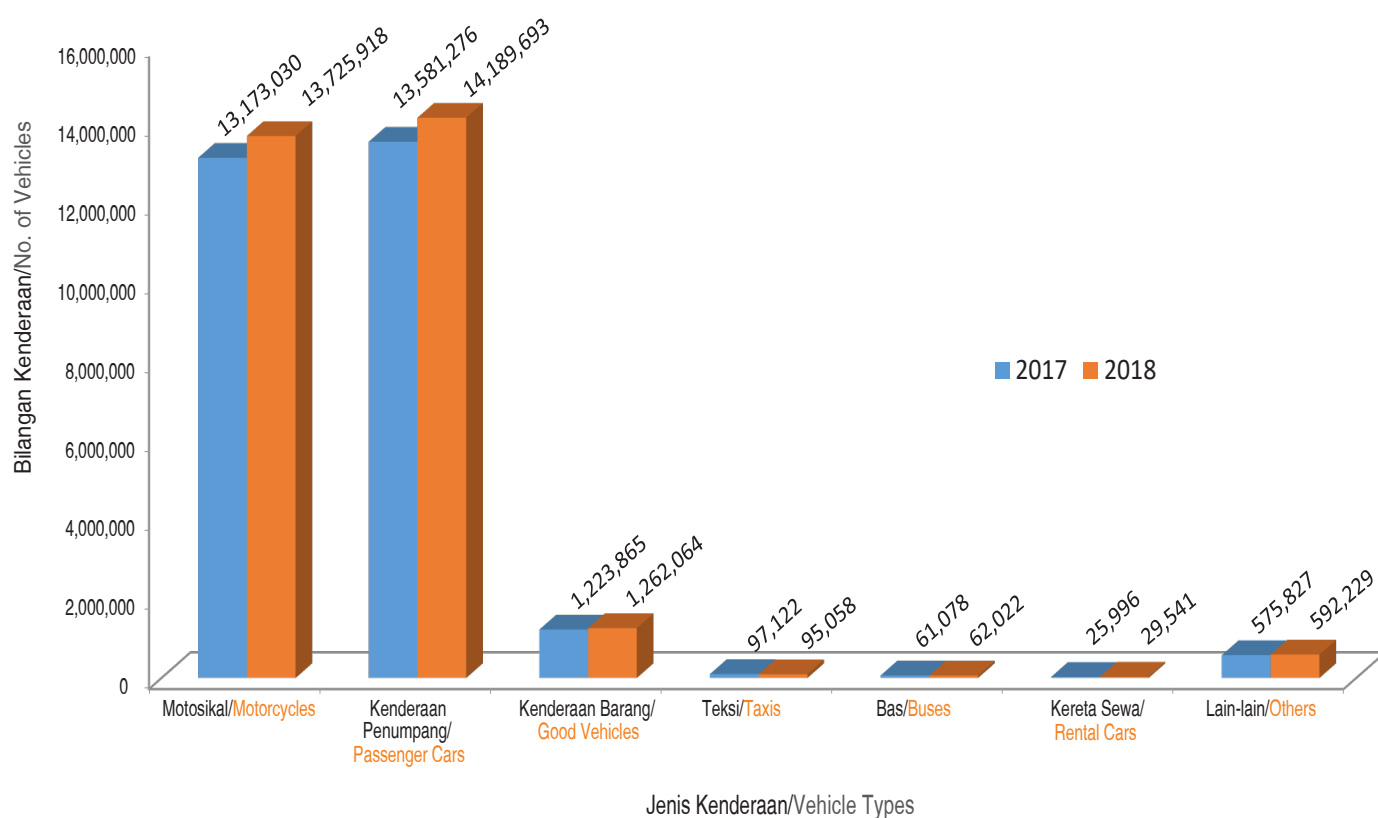
Noise from Motor Vehicles

The emission of noise from motor vehicles is enforced under the Environmental Quality (Motor Vehicle Noise) Regulations 1987.

Enforcement operations to control excessive noise from motorcycles were jointly conducted by the DOE and the Traffic Police. In 2018, a total of 7,333 motorcycles were detained for the noise inspection. Out of this, 138 motorcyclists

ditahan bagi menjalani ujian pelepasan bunyi bising. Dari jumlah ini, 138 penunggang motosikal telah dikompaun oleh pihak polis kerana melanggar had bunyi bising yang dibenarkan. Peratus pematuhan secara keseluruhannya ialah 98.12% (**Rajah 4.11**) yang mana meningkat 0.34% berbanding pada 2017.

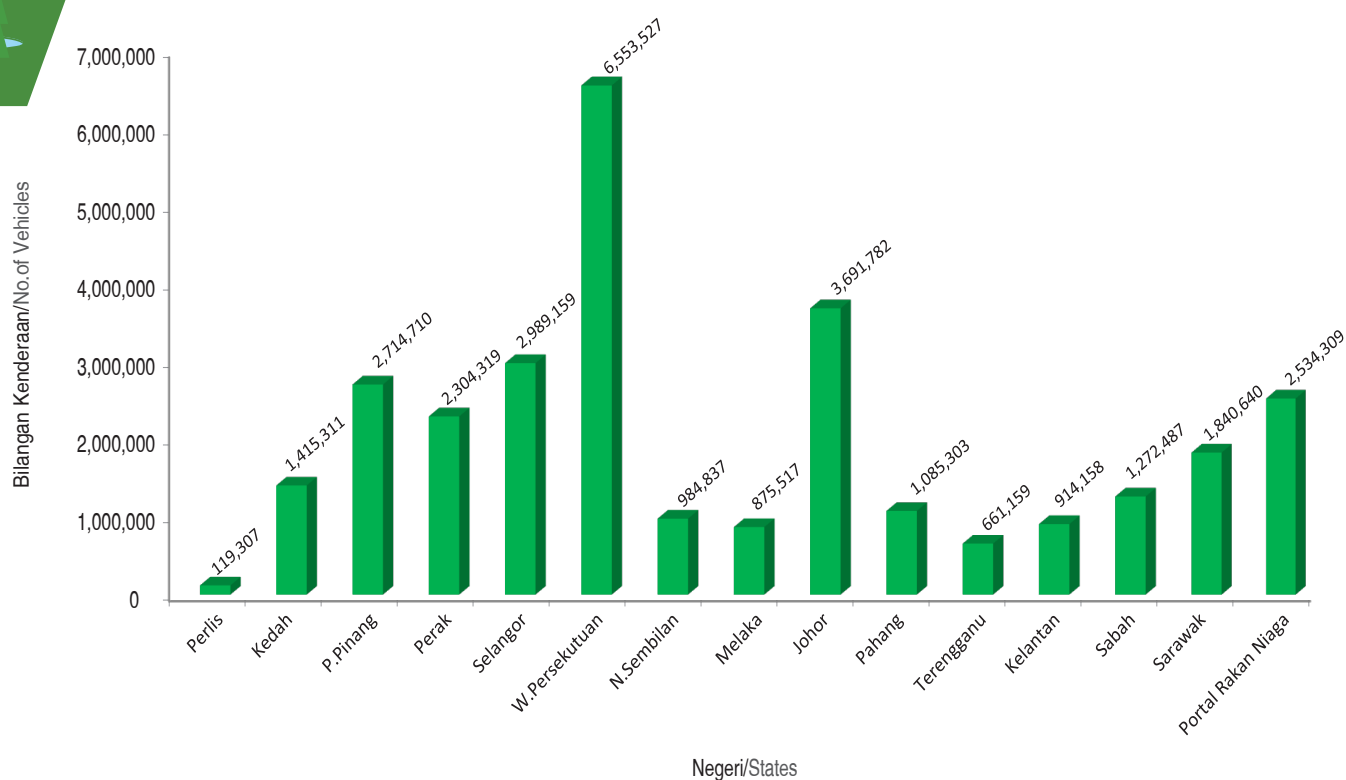
were summoned for violating the stipulated noise limits. The overall percentage of compliance is 98.12% (**Figure 4.11**) which is an increase of 0.34% compared to 2017.



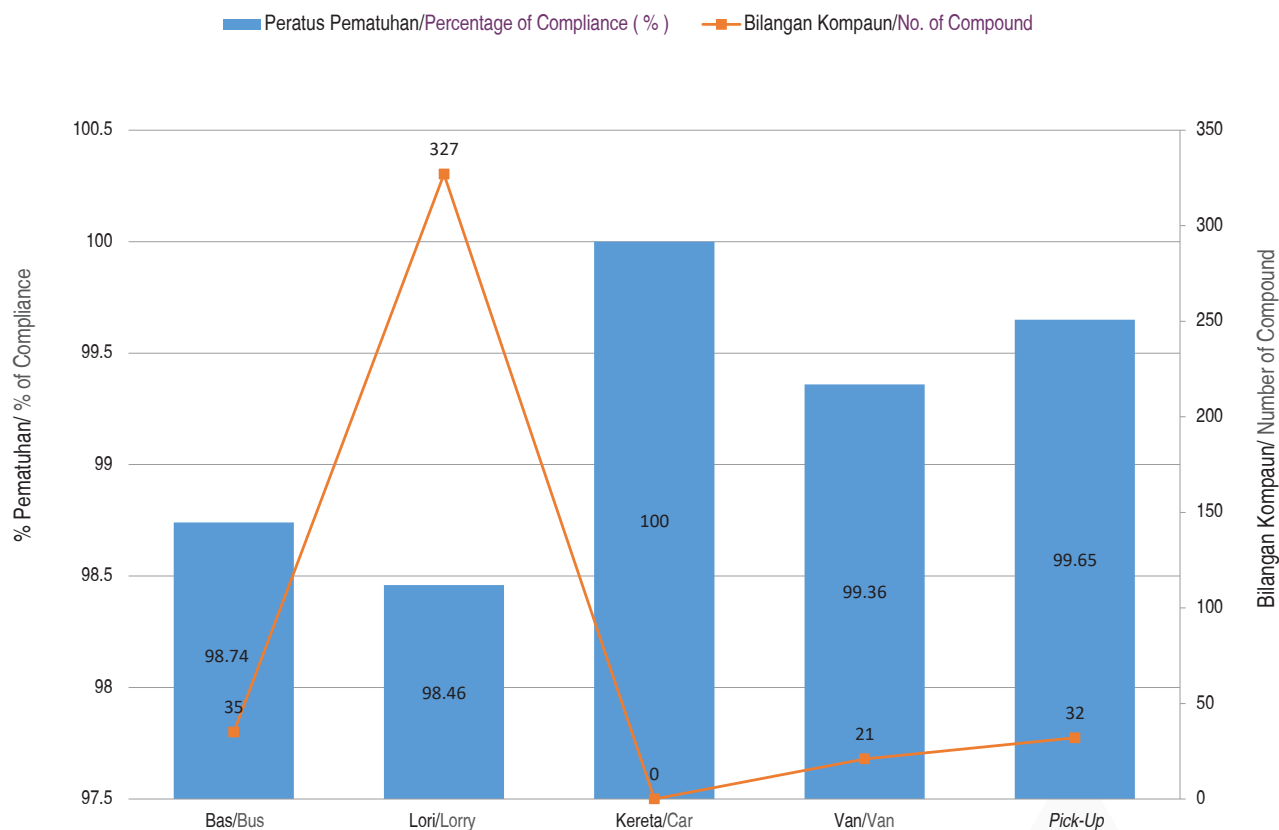
Rajah 4.7 : Bilangan Kenderaan Bermotor Mengikut Jenis, 2018
(Sumber : Jabatan Pengangkutan Jalan, 2018)

Figure 4.7 : Number of Motor Vehicles by Type, 2018
(Source : Road Transport Department, 2018)

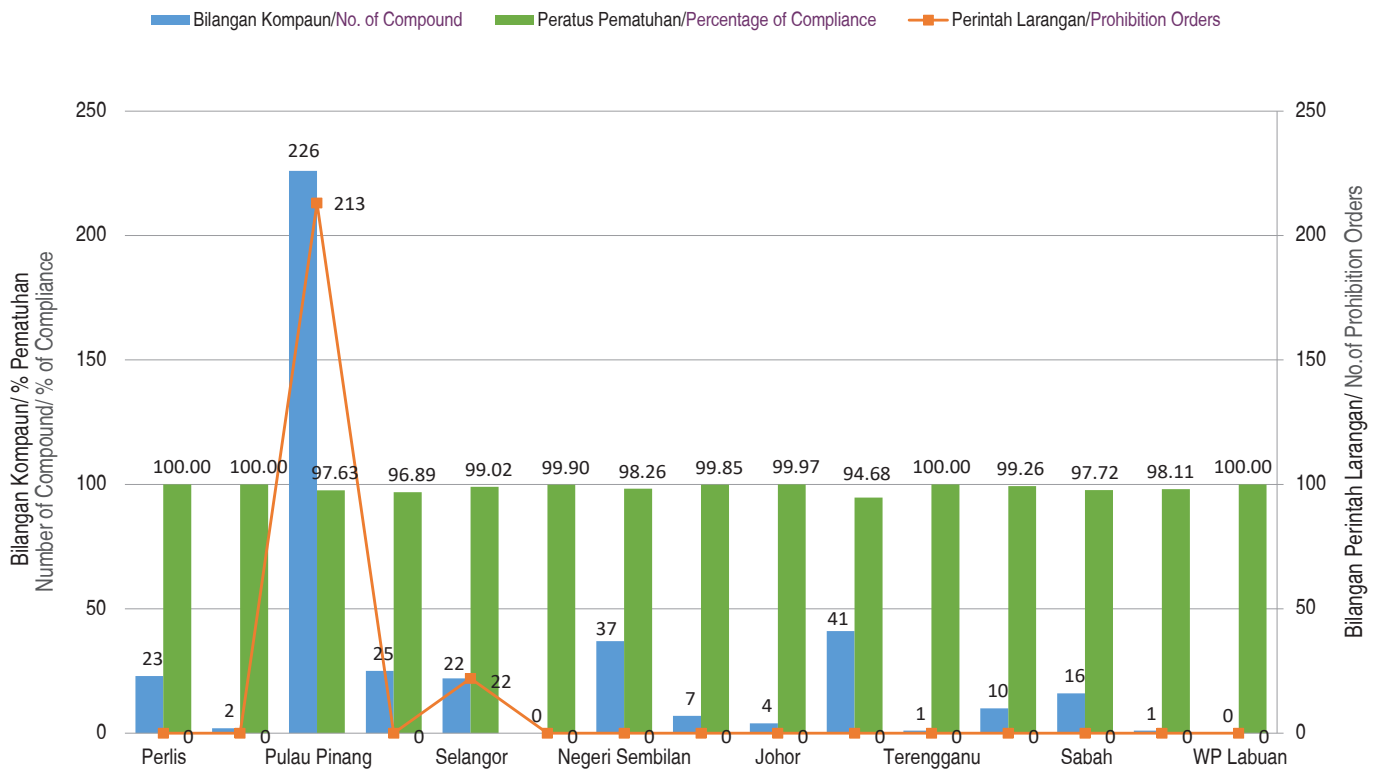




Rajah 4.8 : Bilangan Kenderaan Bermotor Mengikut Negeri, 2018
Figure 4.8 : No. of Vehicles By States, 2018

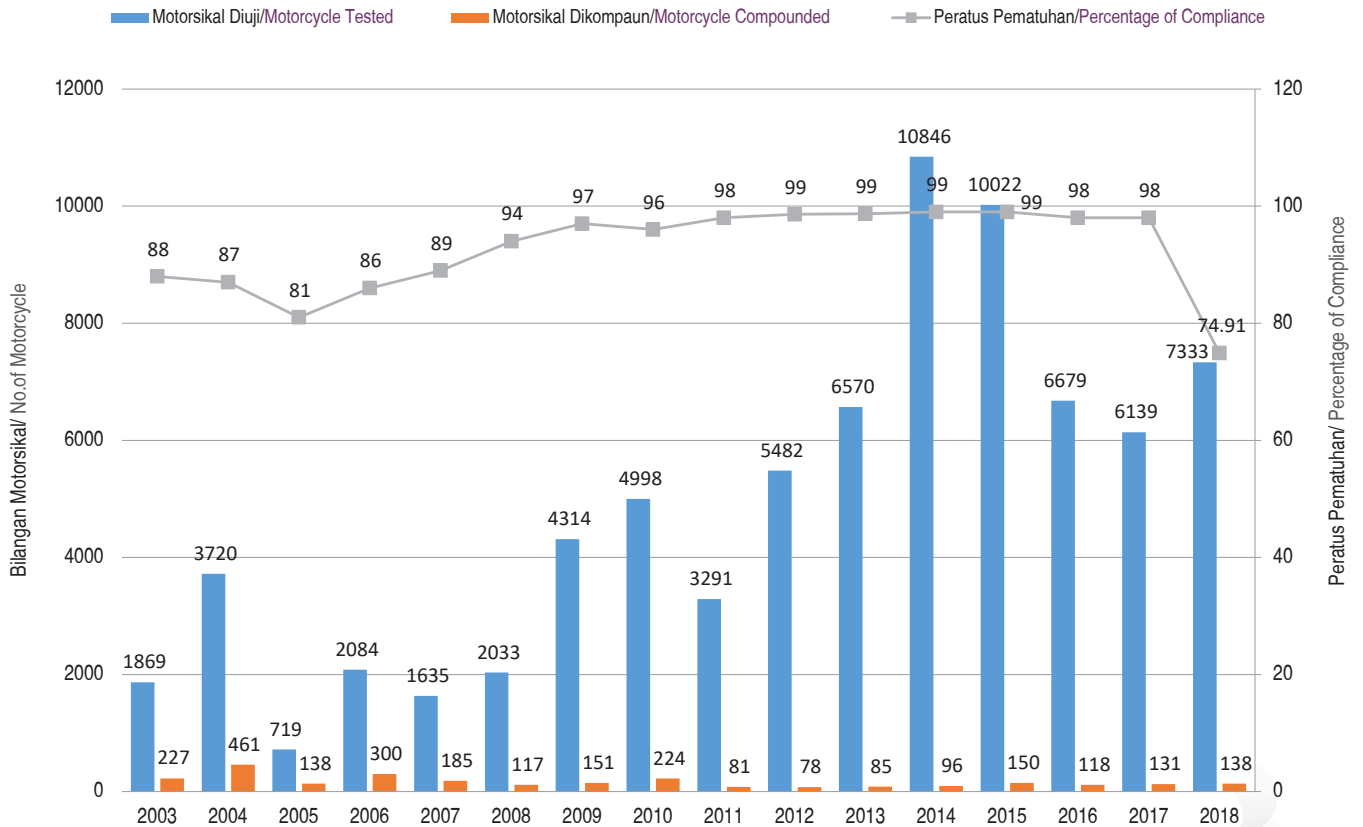


Rajah 4.9 : Peratus Pamatuhan Mengikut Jenis Kenderaan Dan Bilangan Kumpaun, 2018
Figure 4.9 : Percentage of Compliance, According To Type Vehicles And Number of Compound 2018



Rajah 4.10 : Bilangan Kenderaan Dikompaun, Pengeluaran Perintah Larangan dan Peratus Pemuatan, 2018

Figure 4.10 : Number of Vehicles Compounded, Number of Prohibition Orders Issued and Percentage of Compliance, 2018



Rajah 4.11 : Peratus Pemuatan Bilangan Motorsikal Diuji dan Bilangan Komaun (2001 - 2018)
 Figure 4.11 : Percentage of Compliance, Number Of Motorcycle Tested And Compound Issued (2001 - 2018)

KAWALAN TERHADAP PREMIS YANG DITETAPKAN

Kilang Getah Asli Mentah dan Kilang Kelapa Sawit Mentah dikategorikan sebagai premis yang ditetapkan masing-masing di bawah Perintah Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Getah Asli Mentah) 1978 dan Perintah Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Kelapa Sawit Mentah) 1977. Operasi premis-premis ini adalah tertakluk kepada keperluan Seksyen 18, Akta Kualiti Alam Sekeliling, 1974 di mana pemilik premis ini perlu mempunyai lesen daripada Jabatan Alam Sekitar bagi menduduki dan/atau menggunakan premis.

Kilang Getah Asli Mentah

Pada tahun 2018, sejumlah 59 buah kilang getah asli mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Getah Asli Mentah), 1978. Daripada jumlah ini, 45 buah kilang telah dilesenkan bagi melepaskan efluen yang telah diolah ke alur air, sebuah (1) kilang telah dilesenkan untuk melepaskan efluen ke atas tanah, manakala 13 buah kilang dibenarkan untuk mengitar semula efluen. Tempoh lesen yang diberikan adalah berbeza bagi setiap premis; kurang dari setahun bagi premis yang tidak bermasalah dan setahun bagi premis yang bermasalah. **Rajah 4.12** menunjukkan bilangan kilang getah asli mentah mengikut negeri.

Pada tahun 2018 selari dengan Hala Tuju Baharu JAS, pegawai-pegawai penguatkuasa JAS Negeri telah menjalankan sejumlah 103 pemeriksaan secara *desktop* dan 155 pemeriksaan lapangan ke atas 59 buah kilang getah asli mentah yang telah dilesenkan.

CONTROL OF PRESCRIBED PREMISES

Raw natural rubber factories and crude palm oil mills are classified as prescribed premises under the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Order, 1978 and the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Order, 1977 respectively. The operation of these premises are subjected to the requirement of Section 18 of the Environmental Quality Act, 1974 whereby the owners of the premises are required to obtain a licence from the Department of Environment for the occupation and/or use of the said premises.

Raw Natural Rubber Factories

In 2018, there were 59 raw natural rubber factories licensed under the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations, 1978. Out of these, 45 factories were licensed to discharge treated effluent into inland watercourse, one (1) factories was permitted to practise land disposal, while the remaining 13 factories were allowed to recycle their effluent. The licensing periods of these premises varies; less than a year for problematic premises and a year for non-problematic premises **Figure 4.12** shows the number of raw natural rubber factories according to states.

In 2018, in line with DOE's new strategic plan, have 103 desktop inspections and 155 field inspections has been conducted by the state DOE enforcement officers on 59 licensed raw natural rubber factories.



Sistem Pengolahan Effluen (SPE) di Kilang Getah Asli Mentah
Effluent Processing System (EPS) in Raw Natural Rubber Factory

Hala Tuju Baharu JAS yang diperkenalkan merupakan transformasi daripada *Command and Control (CAC)* kepada *Self Regulation (SR)* di mana keduanya saling melengkapi antara satu sama lain. Kaedah pelaksanaan adalah melibatkan pemeriksaan di lapangan dan pemeriksaan *desktop*.

Kilang-kilang yang mempunyai rekod pematuhan yang rendah sebelum ini telah diberi keutamaan untuk pemeriksaan. Tindakan susulan pemeriksaan penguatkuasaan yang diambil adalah seperti yang ditunjukkan dalam **Rajah 4.12**.

Sejumlah 1 arahan lapangan dan 27 notis arahan telah dikeluarkan kepada premis-premis tersebut supaya mengambil tindakan pembaikan bagi mematuhi keperluan perundangan. Sejumlah 4 kompaun dikeluarkan dan satu premis dalam tindakan mahkamah.

The DOE's new strategic plan is a transformation of Command and Control (CAC) to Self Regulation (SR) where it complement each other. The will involve exeertion of the plan, enforcement involve field inspection and dekstop inspection.

The factories with previous record of low compliance were given priority for inspections. Follow up actions taken as a result of these inspections are as shown in **Figure 4.12**.

A total of one (1) field citation and 27 notices were issued to the concerned premises, for them to take corrective actions in order to comply with the legal requirements. Four (4) compounds were issued and one (1) non-compliance case was taken to court.



Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Premis yang Ditetapkan) (Getah Asli Mentah) 1978

Pada tahun 2018, pencapaian pematuhan keseluruhan kilang getah asli mentah yang tertakluk di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Getah Asli Mentah) 1978 adalah 97% bagi pemeriksaan *desktop* dan 97% bagi pemeriksaan lapangan.

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014

Kilang getah asli mentah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014. Pada tahun 2018, pencapaian pematuhan keseluruhan oleh kilang getah asli mentah adalah 100% bagi pemeriksaan *desktop* dan 100% bagi pemeriksaan lapangan.

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005

Pada tahun 2018, pencapaian pematuhan keseluruhan oleh kilang getah asli mentah bagi Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 adalah 100% bagi pemeriksaan *desktop* dan 97% bagi pemeriksaan lapangan.

Kilang Kelapa Sawit Mentah

Sejumlah 460 buah kilang kelapa sawit mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Kelapa Sawit Mentah), 1977 pada tahun 2018. Dari 460 buah kilang yang dilesenkan, 316 buah kilang telah dilesenkan bagi melepaskan

Status Of Compliance With The Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations, 1978

In 2018, the overall compliance performance by the raw natural rubber factories subjected to the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations, 1978 was 97% for desktop inspection and 97% for field inspection.

Status Of Compliance With The Environmental Quality (Clean Air) Regulations, 2014

Raw natural rubber factories are also subjected to the Environmental Quality (Clean Air) Regulations, 2014. In 2018, overall compliance performance by the raw natural rubber factories was 100% for desktop inspection and 100% for field inspection.

Status Of Compliance With The Environmental Quality (Scheduled Wastes) Regulations, 2005

In 2018, overall compliance performance by the raw natural rubber factories for the Environmental Quality (Scheduled Wastes) Regulations, 2005 was 100% for desktop inspection and 97% for field inspection.

Crude Palm Oil Mills

There were 460 palm oil mills licensed under the Environmental Quality (Prescribed Premises) (Crude Palm Oil Mill) Regulations, 1977 in year 2018. Of these 460 licensed prescribed premises, 316 premises were granted permission to discharge treated effluent into inland

efluen yang diolah ke dalam alur air, 12 buah kilang melupuskan efluén ke atas tanah, 77 buah kilang melupuskan efluén dengan menggunakan gabungan kaedah alur air dan atas tanah. Selain itu, enam (6) buah kilang menggunakan kaedah kompos, 48 buah kilang menggunakan gabungan kaedah alur air dan kompos serta 1 buah kilang menggunakan gabungan kaedah atas tanah dan kompos. **Rajah 4.13** menunjukkan bilangan kilang kelapa sawit mentah di Malaysia mengikut negeri.

Pada tahun 2018 selari dengan Hala Tuju Baharu JAS, pegawai-pegawai penguatkuasa JAS Negeri telah menjalankan sejumlah 715 pemeriksaan secara desktop dan 769 pemeriksaan lapangan ke atas 460 buah kilang kelapa sawit mentah yang telah dilesenkan.

watercourse, 12 premises to practice land disposal, 77 premises to discharge effluent by the combination of into inland watercourse and land disposal. Other that, six (6) to practice composting, 48 to discharged treated effluent using a combination of inland watercourse and composting and the other 1 using a combination of land disposal and composting. **Figure 4.13** shows the number of palm oil mills in Malaysia according to states.

In 2018, in link with the DOE's new strategic plan, 715 desktop inspection and 769 field inspection have been conducted on 460 licensed palm oil mills by state DOE enforcement officers.



Kilang Kelapa Sawit
Palm Oil Factory



Hala Tuju Baharu JAS yang diperkenalkan adalah transformasi daripada *Command and Control (CAC)* kepada *Self-Regulation (SR)* dimana kedua-duanya saling melengkapi antara satu sama lain. Kaedah pelaksanaan adalah melibatkan pemeriksaan di lapangan dan pemeriksaan *desktop*.

Kilang-kilang yang mempunyai rekod pematuhan yang rendah sebelum ini telah diberi keutamaan pemeriksaan. Tindakan susulan pemeriksaan penguatkuasaan yang diambil adalah seperti yang ditunjukkan dalam **Rajah 4.13**.

Sejumlah 8 arahan lapangan dan 233 notis arahan telah dikeluarkan kepada premis-premis tersebut supaya mematuhi keperluan perundangan. Sebanyak 43 kompaun dikeluarkan bagi kesalahan yang dilakukan, manakala, empat (4) tindakan mahkamah telah diambil bagi kegagalan mematuhi syarat-syarat lesen.

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Minyak Kelapa Sawit Mentah) 1977

Pada tahun 2018, pencapaian pematuhan keseluruhan kilang kelapa sawit mentah yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Minyak Kelapa Sawit Mentah) 1977 adalah 97% bagi pemeriksaan *desktop* dan 95% bagi pemeriksaan lapangan.

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014

Kilang minyak kelapa sawit mentah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014. Pada

The DOE's new strategic plan is a transformation of Command and Control (CAC) to Self Regulation (SR) where it complement each other. The execution of the plan will involve field inspection and desktop inspection.

The factories with previous record of low compliance were given priority for inspections. Follow up actions taken as a result of these inspections are as shown in **Figure 4.13**.

A total of eight (8) field citations and 233 notices were issued to the concerned mills for them to comply with the legal requirements. 43 compounds were issued for offences committed, while four (4) court actions were taken to the concerned mills for the comply with the licence conditions.

Status Of Compliance With The Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977

In 2018, the overall compliance performance by the crude palm oil mills subjected under the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977 was 97% for desktop inspection and 95% for field inspection.

Status Of Compliance With The Environmental Quality (Clean Air) Regulations, 2014

Palm oil mill is also subjected under the Environmental Quality (Clean Air) Regulations, 2014. In 2018, the overall compliance performance by palm oil

tahun 2018, pencapaian pematuhan keseluruhan oleh kilang minyak kelapa sawit mentah adalah 98% bagi pemeriksaan *desktop* dan 97% bagi pemeriksaan lapangan.

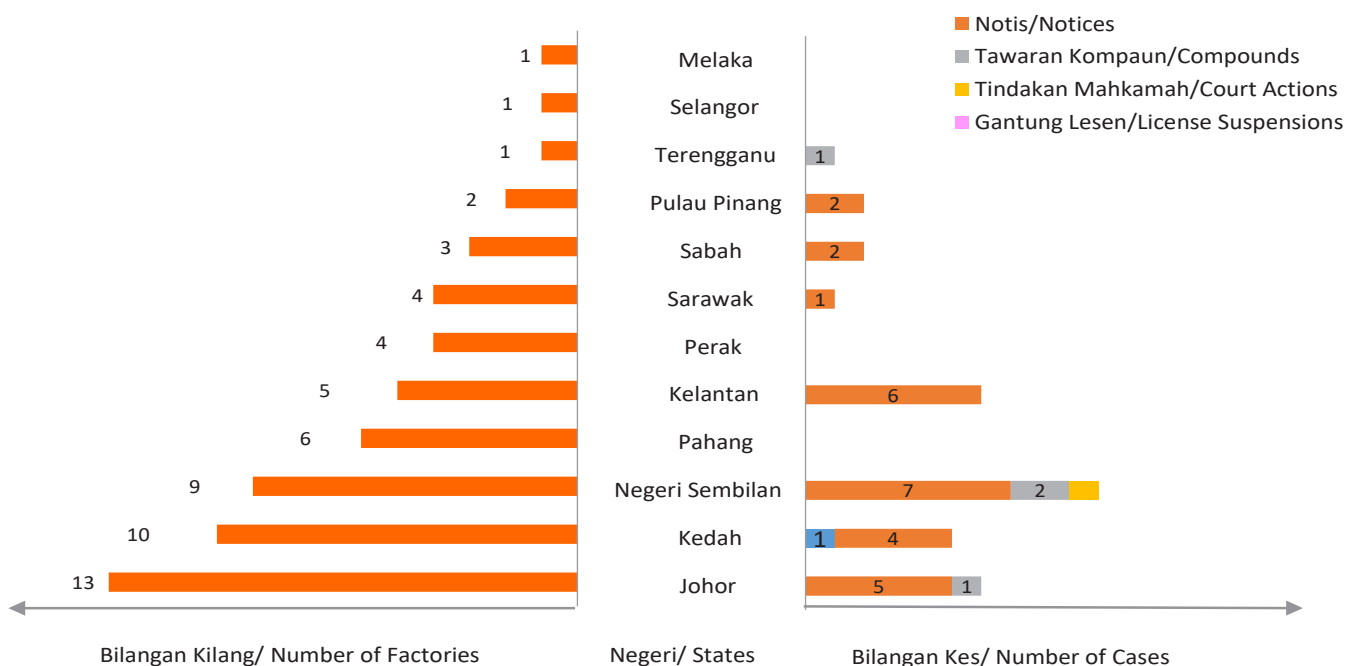
Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005

Pada tahun 2018 pencapaian pematuhan keseluruhan kilang minyak kelapa sawit di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 adalah 99.5% bagi pemeriksaan *desktop* dan 99% bagi pemeriksaan lapangan.

mills was 98% for desktop inspection and 97% for field inspection.

Status Of Compliance With The Environmental Quality (Scheduled Wastes) Regulations, 2005

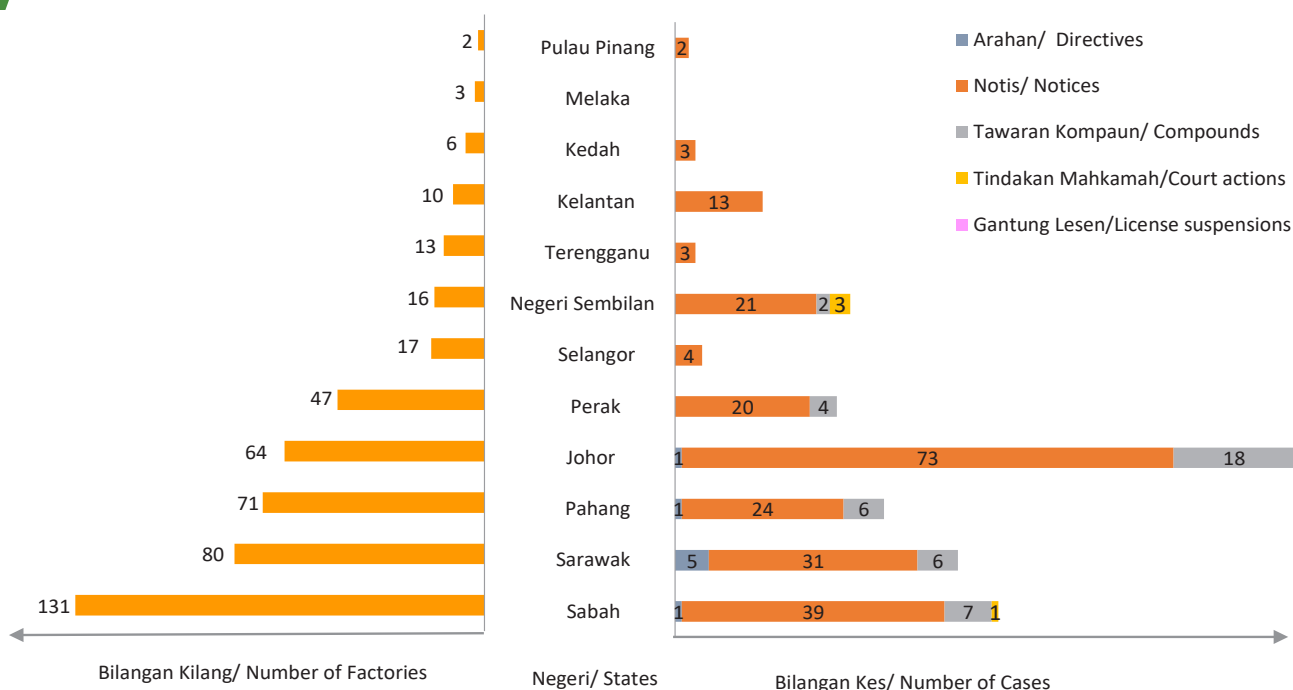
In 2018, the overall compliance performance by the palm oil mills under the Environmental Quality (Scheduled Wastes) Regulations, 2005 was 99.5% for desktop inspection and 99% for field inspection.



Rajah 4.12 : Bilangan Kilang Getah Asli Mentah dan Tindakan Undang-Undang Terhadap Kilang Getah Asli Mentah, 2018

Figure 4.12 : Raw Natural Rubber Factories and Legal Actions Against Raw Natural Rubber Factories, 2018





Rajah 4.13 : Bilangan Kilang Getah Asli Mentah dan Tindakan Undang-Undang Terhadap Kilang Getah Asli Mentah, 2018

Figure 4.13 : Raw Natural Rubber Factories and Legal Actions Against Raw Natural Rubber Factories, 2018

KAWALAN PREMIS YANG BUKAN DITETAPKAN

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009

Premis-premis yang bukan ditetapkan yang melepaskan efluen adalah tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009.

Pada tahun 2018, sejumlah 4,549 pemeriksaan secara *desktop* dan 5,663 pemeriksaan lapangan ke atas 44 kategori industri pembuatan dan lain-lain premis yang bukan ditetapkan yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009.

Hala Tuju Baharu JAS yang diperkenalkan adalah dengan melakukan transformasi daripada *Command and Control (CAC)*

CONTROL OF NON-PRESCRIBED PREMISES

Status of Compliance With The Environmental Quality (Industrial Effluents) Regulations, 2009

The non-prescribed premises that discharge effluents are subjected under the Environmental Quality (Industrial Effluents) Regulations, 2009.

In 2018, DOE conducted 4,549 desktop inspections and 5,663 field inspection on 44 categories of industrial premises and other non-prescribed premises that were subjected to the Environmental Quality (Industrial Effluents) Regulations, 2009.

The DOE's new strategic plan is a transformation of Command and Control (CAC) to Self Regulation (SR) where it

kepada *Self Regulation (SR)* dimana kedua-duanya saling melengkapi antara satu sama lain. Kaedah pelaksanaan adalah melibatkan pemeriksaan di lapangan dan pemeriksaan *desktop*.

Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 99.6% bagi kedua-dua pemeriksaan *desktop* dan pemeriksaan di lapangan. Terdapat 34 kategori industri mencapai pematuhan 100% pada tahun 2018 (**Rajah 4.14**).

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014

Premis-premis yang bukan ditetapkan adalah juga tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014. Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 99.3% bagi pemeriksaan *desktop* dan 99.6% bagi pemeriksaan lapangan. Terdapat 31 kategori industri mencapai pematuhan 100% pada tahun 2018 (**Rajah 4.15**).

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005

Premis-premis yang bukan ditetapkan adalah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005. Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 99.5% bagi pemeriksaan *desktop* dan 99.0% bagi pemeriksaan lapangan. Antara kegagalan pematuhan yang direkodkan adalah termasuk gagal mengemukakan pemberitahuan mengenai pengeluaran buangan terjadual kepada JAS, buangan terjadual tidak distor dan tidak dilabel dengan sempurna, serta gagal menyimpan rekod inventori buangan terjadual dengan tepat dan terkini (Peraturan-Peraturan 3, 8, 9, 10 dan 11).

complement each other. The execution of the plan involve inspection at premises and desktop inspection.

The overall compliance achievement by the non-prescribed premises was 99.6% for both desktop and field inspection. There were 34 categories of industries achieved 100% compliance in 2018 (**Figure 4.14**).

Status of Compliance With The Environmental Quality (Clean Air) Regulations, 2014

The non-prescribed premises are also subjected to the Environmental Quality (Clean Air) Regulations, 2014. The overall compliance by the non-prescribed premises was 99.3% for desktop inspection and 99.6% for field inspection. There were 31 categories of industries that achieved 100% compliance in 2018 (**Figure 4.15**).

Status of Compliance With The Environmental Quality (Scheduled Wastes) Regulations, 2005

The non-prescribed premises are also subjected to the Environmental Quality (Scheduled Wastes) Regulations, 2005. The overall compliance achieved by the non-prescribed premises was 99.5% for desktop inspection and 99.0% for field inspection. Among the non-compliances recorded including failure to submit notifications of scheduled wastes generation to DOE, improper storage and improper labelling of scheduled wastes as well as failure to keep accurate and up-to-date inventory records of scheduled wastes (Regulations 3, 8, 9, 10 and 11).



Pada tahun 2018, terdapat 27 kategori industri mencapai pematuhan 100% terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 (**Rajah 4.16**).

Tindakan Penguatkuasaan

Sejumlah 154 kes premis yang tidak patuh telah dituduh di mahkamah dengan denda berjumlah RM 2,323,750. Tindakan-tindakan penguatkuasaan lain yang diambil adalah pengeluaran 29 arahan lapangan, 1,328 notis arahan dan 1,190 kompaun kepada industri supaya mengambil tindakan yang sewajarnya bagi mematuhi Akta Kualiti Alam Sekeliling, 1974, Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009, Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005.

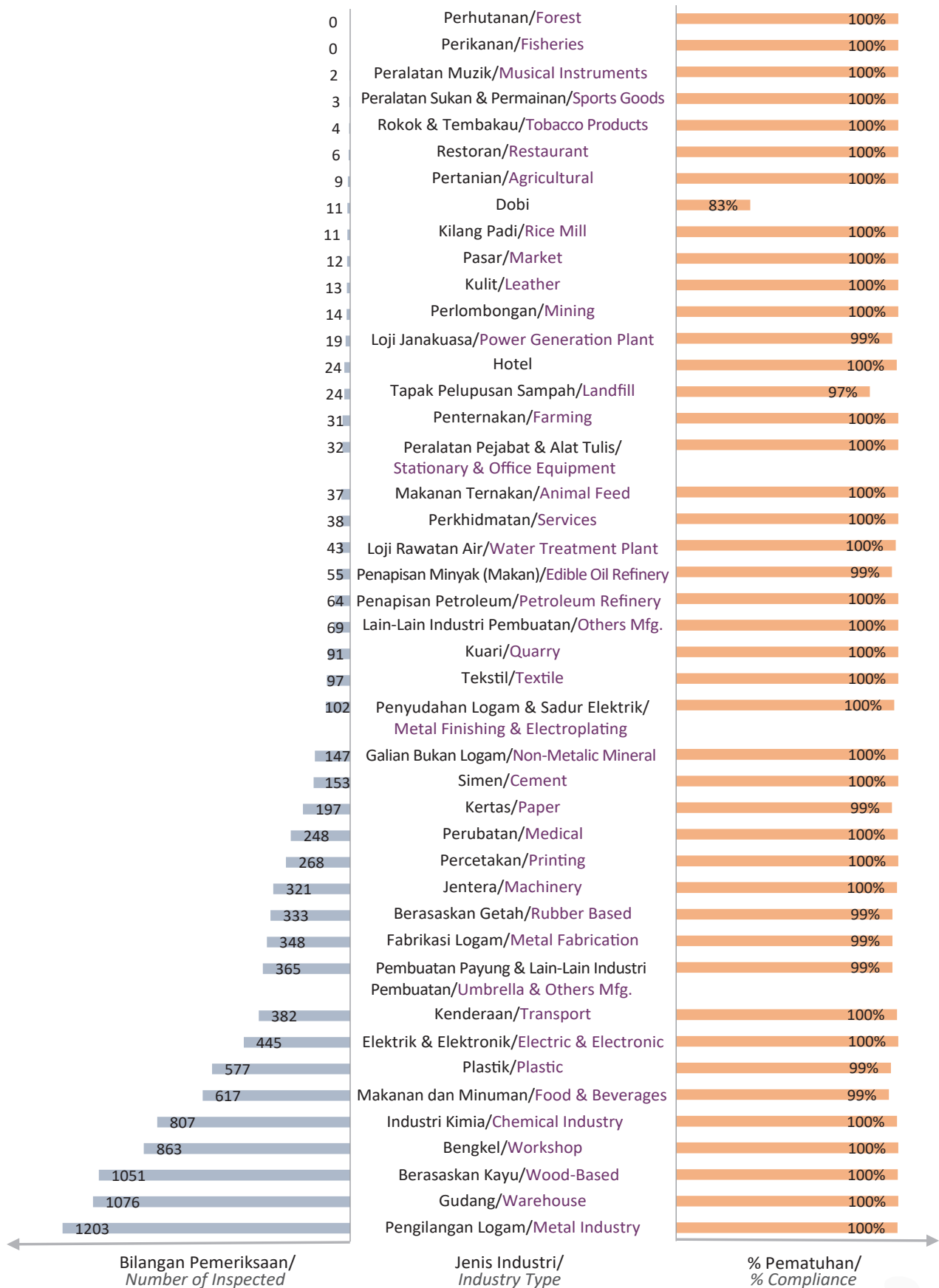
Bagi meningkatkan pematuhan kepada peraturan, JAS telah mengeluarkan arahan-arahan kepada industri supaya memasang alat kawalan pencemaran yang sesuai dan cekap, meningkatkan keupayaan kemudahan kawalan pencemaran yang sedia ada dan juga menyediakan jadual perancangan dan pelaksanaan sistem pengurusan alam sekitar yang baik. Sebagai tambahan, pelbagai aktiviti kesedaran dilaksanakan sepanjang tahun untuk kumpulan sasaran yang spesifik. Aktiviti-aktiviti tersebut termasuklah dialog, seminar dan bengkel untuk industri dengan tujuan untuk meningkatkan tahap pematuhan undang-undang. JAS juga dalam usaha memastikan pematuhan sepenuhnya, mempromosi penggunaan teknologi kawalan yang cekap, amalan pengeluaran bersih serta pematuhan sendiri. Pihak industri juga dinasihatkan untuk mewujudkan sistem pengurusan alam sekitar yang baik dan digalakkan untuk mendapatkan pensijilan ISO 14000.

In 2018, there were 27 categories of industry the Environmental Quality (Scheduled Wastes) Regulations, 2005 achieved 100% compliance (**Figure 4.16**).

Enforcement Actions

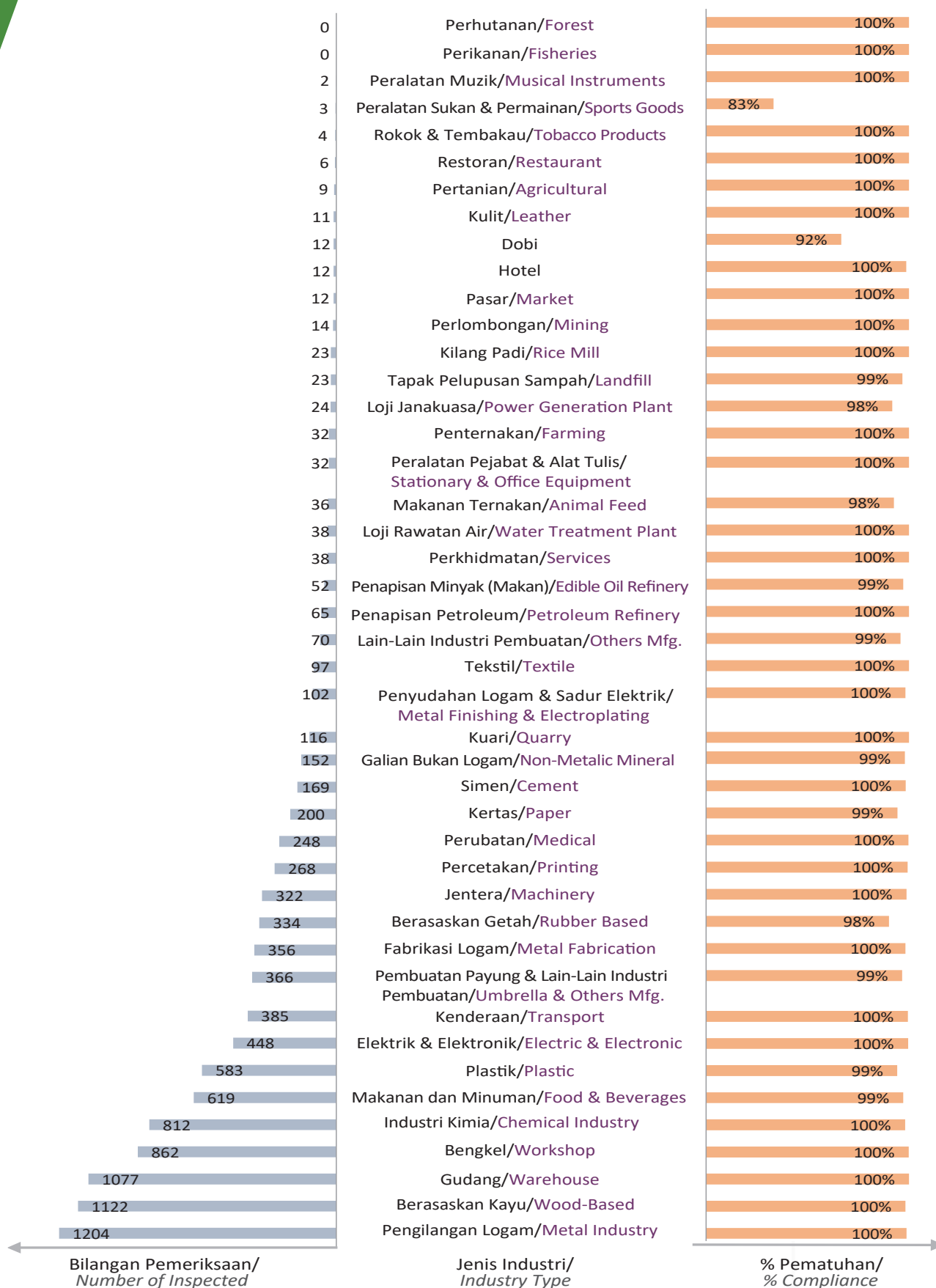
A total of 154 cases of non-compliance premises were charged in courts with a total fine of RM 2,323,750. Other enforcement actions taken against the non-complying industries were issuance of 29 field citations, 1,328 notices and 1,190 compounds to industries for them to take appropriate actions in order to comply with the Environmental Quality Act, 1974, Environmental Quality (Industrial Effluents) Regulations, 2009, Environmental Quality (Clean Air) Regulations, 2014 and Environmental Quality (Scheduled Wastes) Regulations, 2005.

In order to improve compliance to regulations, DOE has issued directives to the industries to install suitable and efficient pollution control equipment, upgrade existing pollution control facilities and to have a good planning and implementation schedule of environmental management systems. In addition, various awareness activities were organized throughout the year for specific target groups. Such activities included dialogues, seminars and workshops for industries, with the aim to improving the level of regulatory compliance. The DOE, in the effort to ensure full compliance, also promoted the adoption of more efficient control technologies, cleaner production practices as well as self-regulations. The industries were also advised to set up a good environmental management system and to be ISO 14000 certified.



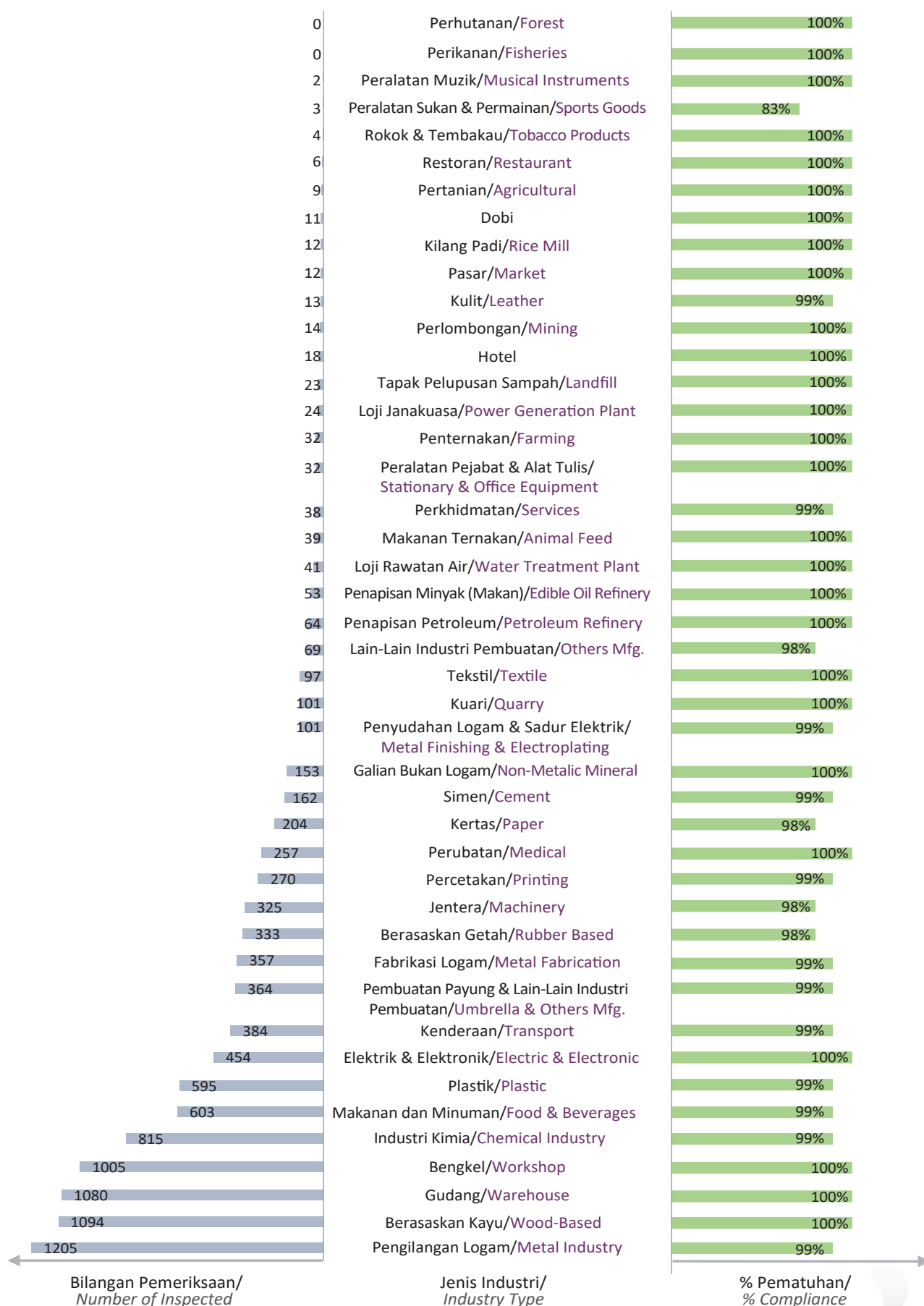
Rajah 4.14 : Status Pematuhan Industri Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009, 2018

Figure 4.14 : Compliance Status to the Environmental Quality (Industrial Effluent) Regulations 2009, 2018



Rajah 4.15 : Status Pemuatan Industri Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014, 2018

Figure 4.15 : Compliance Status to the Environmental Quality (Clean Air) Regulations 2014, 2018



Rajah 4.16 : Status Pematuhan Industri Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005, 2018

Figure 4.16 : Compliance Status to the Environmental Quality (Scheduled Wastes) Regulations 2005, 2018

TINDAKAN UNDANG-UNDANG

Pendakwaan

Pada tahun 2018, sejumlah 174 kes kesalahan di bawah Akta Kualiti Alam Sekeliling (AKAS) 1974 telah didakwa di mahkamah dengan denda yang dikenakan berjumlah RM 2,562,250.00 dan hukuman penjara selama 3 hari (**Rajah 4.17**).

Daripada jumlah keseluruhan kes tersebut, sebanyak 45 (25%) kes mahkamah adalah melibatkan kesalahan di bawah Seksyen 16(1), Akta Kualiti Alam Sekeliling 1974 dengan jumlah denda sebanyak RM 567,000.00. Sebanyak 45 (25%) kes mahkamah melibatkan kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) dengan jumlah denda sebanyak RM 876,000.00 sementara 84 (50%) kes yang selebihnya melibatkan kesalahan-kesalahan lain di bawah AKAS 1974.

Kompaun

Sejumlah 2,299 kompaun telah dikeluarkan sepanjang tahun 2018 kepada premis dan syarikat untuk pelbagai kesalahan di bawah AKAS 1974. Pecahan mengikut kesalahan adalah seperti di **Rajah 4.18**.

LEGAL ACTION

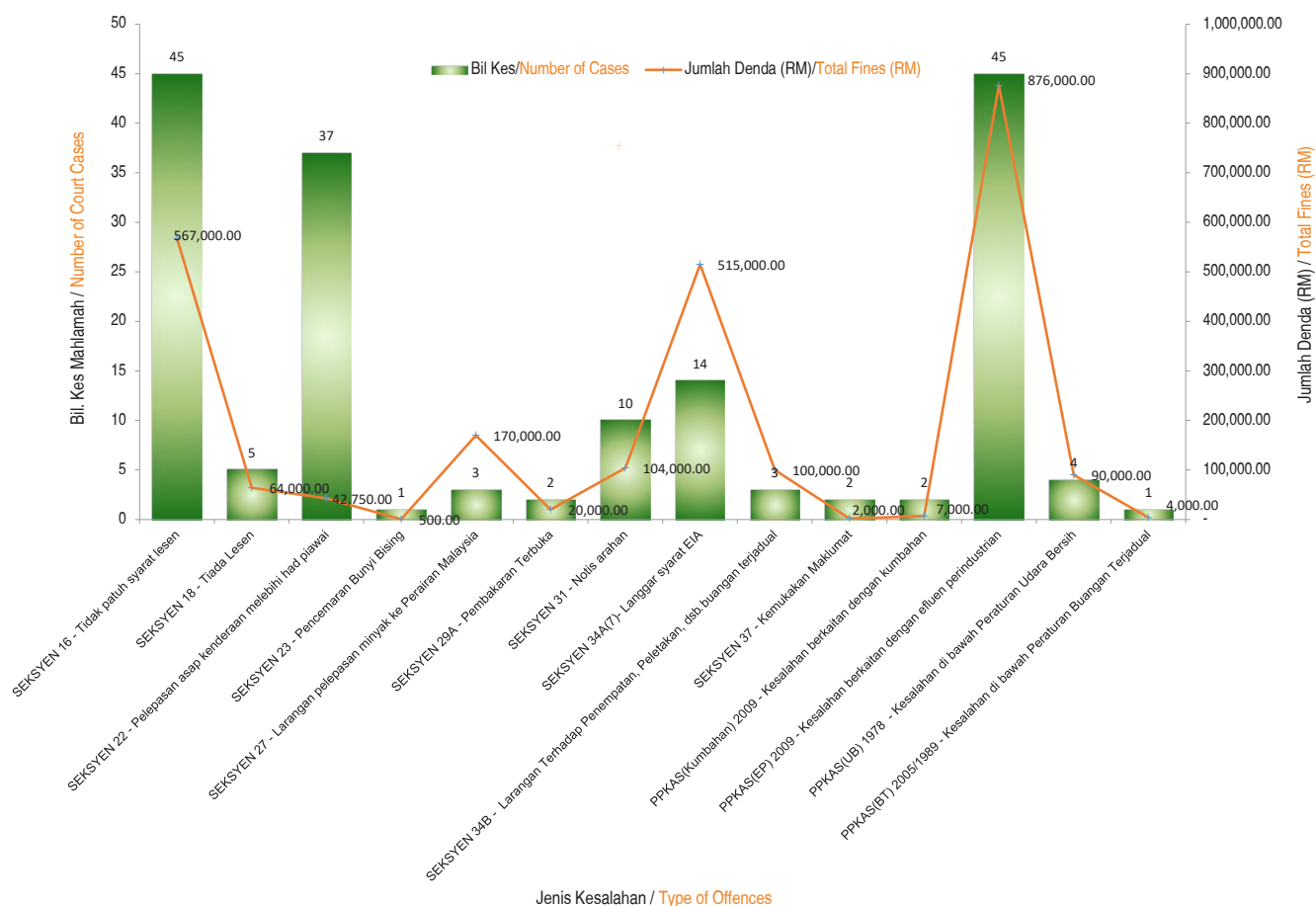
Prosecution

In 2018, a total of 174 offences were prosecuted under the Environmental Quality Act (EQA) 1974 with a total fine of RM 2,562,250.00 and imprisonment of 3 days (**Figure 4.17**).

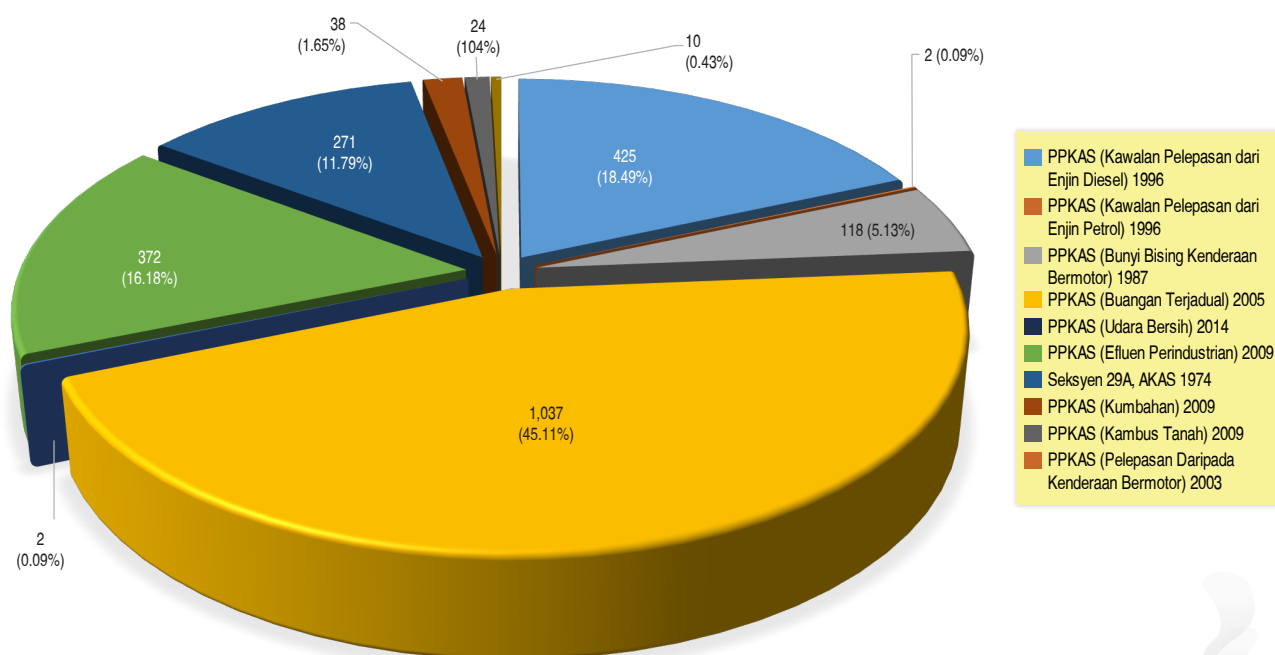
Out of this total, 45 (25%) court cases involved offences under Section 16(1), of the EQA 1974 with a total fine of RM567,000.00. There were 45 (25%) court cases which involved offences under Environmental Quality (Industrial Effluent) Regulations 2009 with a total fine of RM 876,000.00 while the remaining 84 (50%) cases were prosecuted for various other offences under the EQA 1974.

Compounds

A total of 2,299 compounds were issued in 2018 to premises and companies for various offences under the EQA 1974. Breakdown by offences is shown in **Figure 4.18**.



Rajah 4.17 : Bilangan Kes Mahkamah dan Denda, 2018
Figure 4.17 : Number of Court Cases and Fines, 2018



Rajah 4.18 : Bilangan Kes Kompaun Mengikut Pecahan Kesalahan, 2018
Figure 4.18 : Number Of Compound Cases According To Environmental Quality Regulations, 2018



MAKLUMBALAS TERHADAP PENGADUAN AWAM

Pada tahun 2018, sejumlah 7,927 aduan pencemaran alam sekitar telah diterima oleh Jabatan Alam Sekitar. 4,684 kes aduan telah diambil tindakan di bawah peruntukan Akta Kualiti Alam Sekeliling (AKAS) 1974 dan peraturan-peraturan di bawahnya oleh pejabat JAS Negeri, manakala 879 kes aduan adalah diluar bidangkuasa JAS dan telah dirujuk kepada agensi lain yang berkaitan untuk diambil tindakan. **(Rajah 4.19)**

Pada tahun 2018, Selangor menerima aduan yang tertinggi iaitu sebanyak 2,568 kes (34.5%), diikuti oleh Johor sebanyak 865 kes (11.6%) dan Pulau Pinang sebanyak 640 kes (8.6%). Wilayah Persekutuan Putrajaya menerima aduan yang paling sedikit iaitu sebanyak 10 kes (0.1%) dan diikuti dengan Wilayah Persekutuan Labuan iaitu sebanyak 12 kes (0.2%).

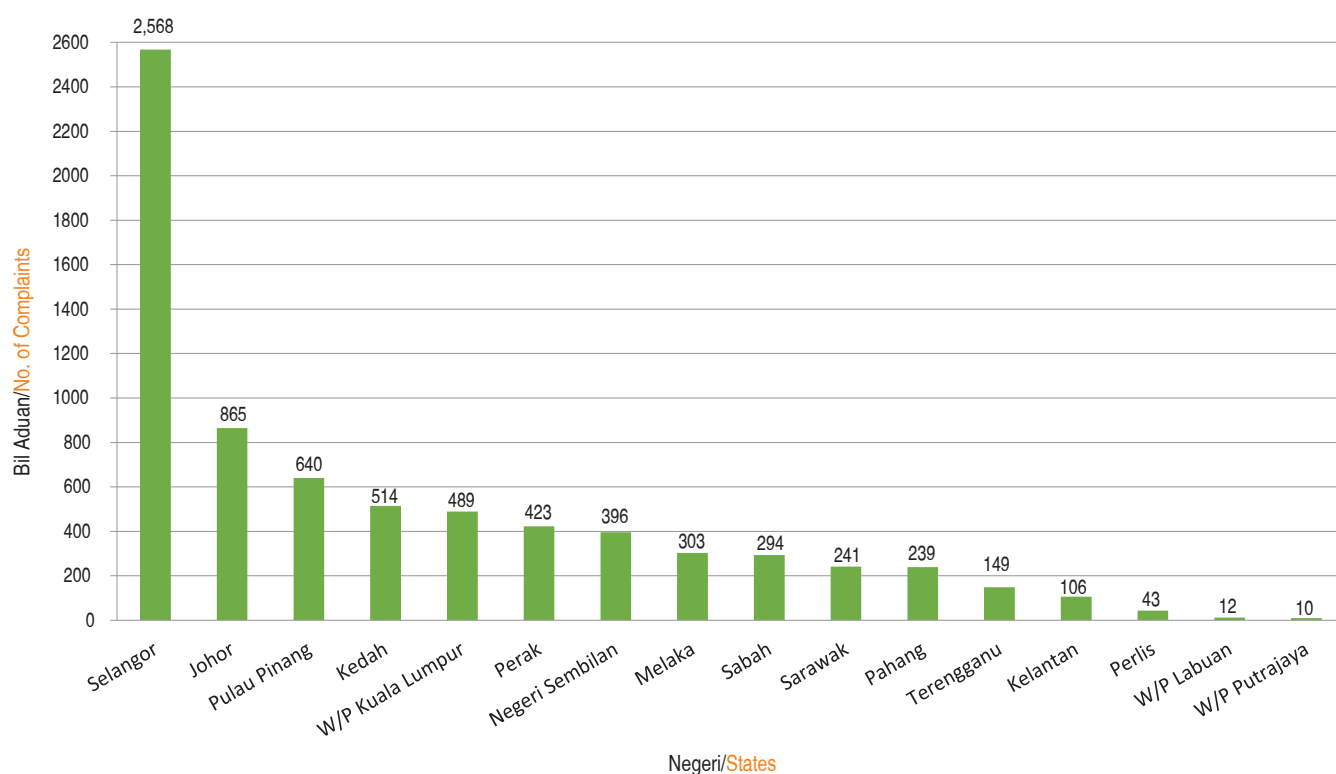
Seperti tahun-tahun yang sebelumnya, bilangan aduan pencemaran yang tertinggi adalah berkaitan dengan pencemaran udara iaitu sebanyak 5,740 kes (78.7%), sebanyak 671 kes (9.2%) berkaitan pencemaran air, sebanyak 264 kes (3.6%) berkaitan pencemaran bunyi, sebanyak 143 kes (2%) berkaitan buangan terjadual, sebanyak 92 kes (1.3%) berkaitan tumpahan minyak, sebanyak 52 kes (0.7%) berkaitan pencemaran tanah dan sebanyak 330 kes (4.5%) lain-lain aduan **(Rajah 4.20)**.

RESPONSE TO PUBLIC COMPLAINTS

In 2018, DOE has received 7,927 environmental pollution complaints in year 2017. Based on this number, 4,684 were under the Environmental Quality Act, 1974 and investigated by the DOE State Offices, while the remaining 879 cases were outside the jurisdiction of DOE and was referred to other relevant agencies. **(Figure 4.19)**

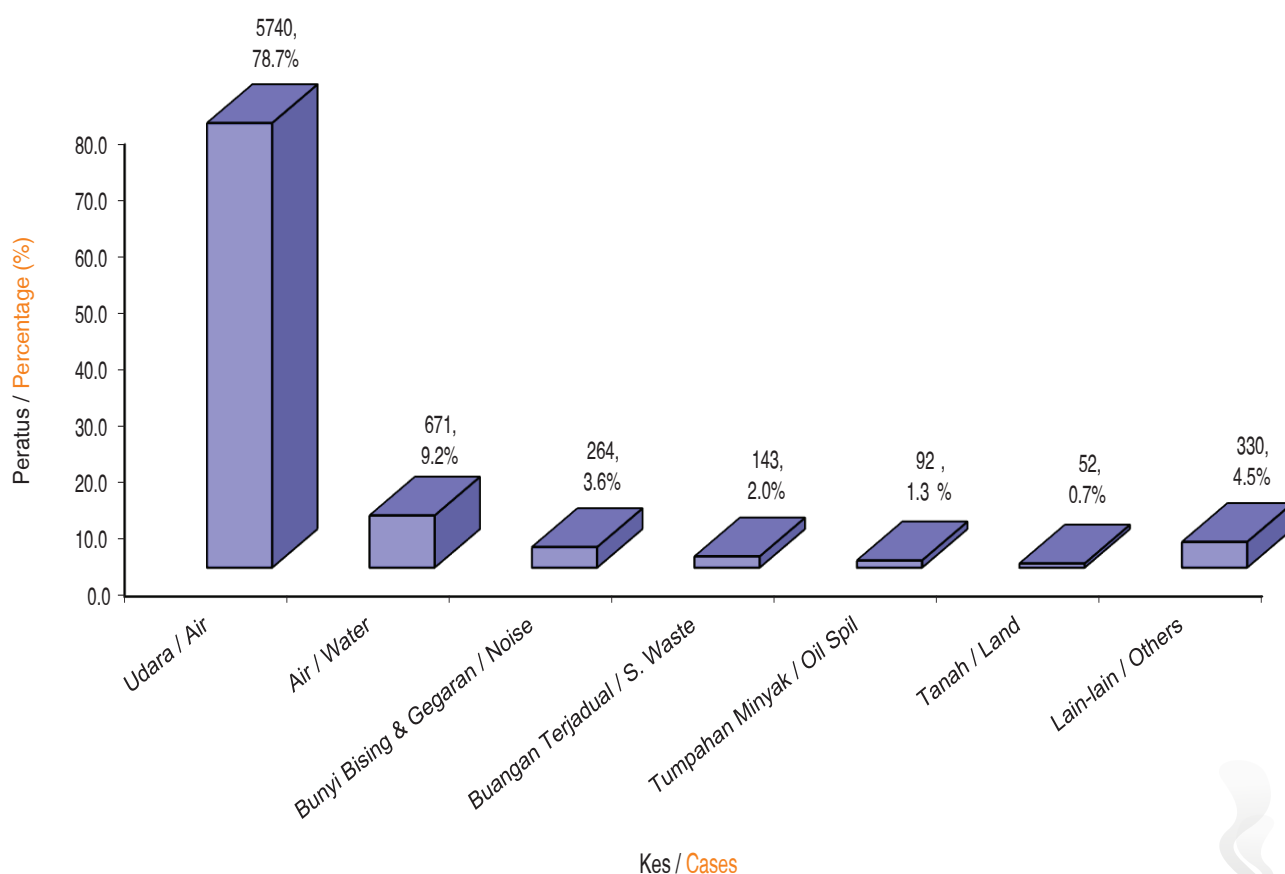
In year 2017, Selangor on the highest number of complaints received recorded 2,568 (34.5%) complaints, followed by Johor with 865 (11.6%) and Pulau Pinang with 640 (8.6%). Federal Territory of Putrajaya recorded the least number of complaints received with 10 (0.1%) complaints and followed by Federal Territory of Labuan 12 (0.2%).

As in the previous years, most of the complaints received were related to air pollution 5,740 (78.7%), followed by 671 (9.2%) water pollution, 264 (3.6%) noise pollution, 143(2%) on illegal dumping of scheduled or toxic wastes, 92 (1.3%) oil spillage, 52 (0.7%) land pollution and 330 (4.5%) of other complaints **(Figure 4.20)**.



Rajah 4.19 : Bilangan Aduan Mengikut Negeri, 2018

Figure 4.19 : Number of Complaints by State, 2018



Rajah 4.20 : Bilangan Kes Aduan Mengikut Jenis, 2018

Figure 4.20 : Number of Complaint Cases by Types, 2018





Penguatkuasaan ke atas premis memproses e-waste



Penahanan peralatan proses yang mencemar alam sekitar



Siasatan aduan pencemaran air



Siasatan aduan pencemaran air laut



Penguatkuasaan kilang kitar semula plastik haram



Penggunaan Carta Ringelmann bagi siasatan aduan pencemaran udara





BAB 5

CHAPTER 5



PROGRAM RAKAN ALAM SEKITAR

Program Rakan Alam Sekitar (RAS) yang dilancarkan pada 4 Jun 2009 telah mempunyai seramai 334,062 ahli berdaftar di seluruh Malaysia sehingga 31 Disember 2018. Program Rakan Alam Sekitar (RAS) melibatkan anggota masyarakat secara 'hands-on' iaitu menjadi 'mata dan telinga' untuk membantu agensi-agensi Kerajaan yang bertanggungjawab dalam membanteras kegiatan-kegiatan yang merosakkan atau mencemarkan alam sekitar. Objektif Program RAS adalah seperti berikut:

- Memberi kesedaran alam sekitar di setiap lapisan masyarakat;
- Menanam rasa tanggungjawab di kalangan masyarakat untuk bertindak dan mengambil bahagian dalam menjaga alam sekitar yang dikongsi bersama; dan
- Menyediakan saluran yang tepat bagi masyarakat membuat aduan atau pandangan mengenai alam sekitar kepada agensi-agensi kerajaan berkenaan.

Kayuhan Hijau

Kayuhan Hijau merupakan satu aktiviti berbasikal secara santai yang telah diperkenalkan oleh Bahagian Komunikasi Strategik, Jabatan Alam Sekitar pada pertengahan tahun 2016. Objektif utama aktiviti ini diwujudkan adalah seperti berikut:

- Strategi baru dalam mendekatkan diri dengan masyarakat dalam mempromosi kesedaran alam sekitar.
- Mempromosi pendidikan dan kesedaran alam sekitar melalui medium mesra alam iaitu dengan cara berbasikal.

RAKAN ALAM SEKITAR PROGRAMME

Rakan Alam Sekitar programmes (RAS) was launched on 4 June 2009 and there have been 334,062 registered members until 31 December 2018. Rakan Alam Sekitar (RAS) programmes involves community members in 'hands-on' of the 'eyes and ears' to help the Government agencies responsible for combating the activities that damage or pollute the environment. Objective RAS Program are as follows:

- Provide environmental awareness at all levels of society;
- Planting a sense of responsibility in society to act and participate in caring for the environment is shared; and
- Provide proper channel for the public to make complaints or suggestions about the environment to the government agencies concerned.

Kayuhan Hijau

Kayuhan Hijau is a leisure cycling activity introduced by the Strategic Communications Division, Department of Environment in mid-2016. The main objectives of this activity are as follows:

- A new strategy in bringing people closer to promote environmental awareness.
- Promoting environmental education and awareness through eco-friendly medium.

- Menyokong usaha kearah kelestarian alam sekitar dan mendekati golongan peminat berbasikal dalam mempromosi Rakan Alam Sekitar.
- To support efforts towards environmental sustainability and to approach cycling enthusiasts in promoting *Rakan Alam Sekitar*.



▲ Kayuhan Hijau di sekitar Putrajaya
Cycling around Putrajaya

Enviro Hiking

Enviro Hiking merupakan satu aktiviti yang dijayakan bertujuan untuk memupuk semangat cintakan alam sekitar sambil beriadah. Pada tahun 2018, terdapat dua (2) program *Enviro Hiking* yang dijalankan iaitu di Gunung Angsi, Negeri Sembilan dan Bukit Broga, Selangor. Jumlah peserta yang terlibat adalah seramai 50 orang.

Enviro Hiking ini merupakan program sukarela di mana peserta yang berminat untuk menyertainya perlu mendaftar dan dikenakan sedikit bayaran bagi menanggung kos makan minum serta kos-kos yang berkaitan. Peserta yang terlibat akan digerakkan secara berkumpulan dan diberikan guni untuk diisi dengan sampah yang terdapat di setiap laluan pendakian. Bagi menjadikan program ini lebih menarik, kuiz alam sekitar akan dijalankan bagi menguji pengetahuan peserta mengenai alam sekitar dan hadiah istimewa turut diberikan kepada setiap pemenang.

Enviro Hiking

Enviro Hiking is an activity that aims to inculcate environmental concern by doing leisure activity. In 2018, there are two (2) *Enviro Hiking* programs run at *Gunung Angsi, Negeri Sembilan* and *Bukit Broga, Selangor*. The programme was attended by 50 participants.

Enviro Hiking is a voluntary program where the participants need to pay a minimal fee for meal and a related costs. Participants involved was mobilized in groups and has been given gunny bags to be filled with rubbish found along the route. In order to make this program more interesting, environmental quizzes was conducted to test participants on environmental knowledge and prizes were awarded to each winner.





▲ Program Enviro Hiking di Gunung Angsi, Negeri Sembilan
Enviro Hiking Programme at Gunung Angsi, Negeri Sembilan

Pameran Alam Sekitar

Pada tahun 2018, Jabatan Alam Sekitar Ibu Pejabat telah menyertai sebanyak 20 pameran bertemakan alam sekitar yang dianjurkan oleh institusi – institusi pengajian tinggi, sektor perindustrian, swasta dan agensi kerajaan seperti berikut:

Environmental Exhibitions

In 2018, the Department of Environment Headquarters has participated in 20 environmental exhibitions organized by Institutions of higher learning, industrial, private sector and government agencies as follows:

Jadual 5.1 : Senarai aktiviti pameran bertemakan alam sekitar yang disertai oleh JAS
Table 5.1 : List of environmental exhibitions activities participated by DOE

BIL	PERKARA	PENGANJUR	LOKASI	TARIKH (2018)
1	Jemputan pameran Rakan Alam Sekitar sempena Kayuhan Alam FEST 2018	Kementerian Sumber Asli dan Alam Sekitar (NRE)	Ruang letak kenderaan, Presint 3	14 Januari
2	Jemputan pameran Rakan Alam Sekitar sempena HSE Day	Gamuda Engineering Sdn Bhd	Kota Permai Golf & Country Club	29 dan 30 Januari
3	Jemputan pameran sempena program singgah santai @ PNM#Relakslah dulu	Perpustakaan Negara Malaysia	Perpustakaan Negara Malaysia	24 Februari
4	Jemputan pameran Rakan Alam Sekitar sempena HSE Day	Sunway Construction Sdn Bhd	Parcel F (Precint 1)	27 Mac

BIL	PERKARA	PENGANJUR	LOKASI	TARIKH (2018)
5	Jemputan pameran Rakan Alam Sekitar sempena International Conference on Atmospheric Composition and Climate Change in Asia 2018 (ICACCCA 2018)	Universiti Kebangsaan Malaysia	Universiti Kebangsaan Malaysia	1 April
6	Jemputan pameran sempena majlis pelancaran kempen kitar semula peringkat sekolah	Majlis Bandaraya Shah Alam	Dataran Kemerdekaan, Shah Alam	1 Mac
7	Jemputan pameran Rakan Alam Sekitar sempena "Enhancing Integrity Project" oleh	Akademi Pencegahan Rasuah Malaysia	Universiti Tenaga Nasional (UNITEN)	6 April
8	Jemputan pameran sempena CSR Mangrove Planting Programme	Hutan Simpan Banjar Utara, Kuala Selangor	KERRY Ingridients	12 Mei
9	Jemputan pameran Rakan Alam Sekitar sempena Hari Ozon Sedunia	Seksyen Ozon, Bahagian Udara JAS	The Saujana Hotel, Damansara	25 September
10	Jemputan pameran bagi karnival tenaga, sains, teknologi, alam sekitar dan perubahan iklim	MESTECC	Sekolah Kebangsaan Chepir, Sik, Kedah	2 Hingga 4 Oktober
11	Jemputan pameran mengenai Kuari	Institut Kuari Malaysia	Palm Garden Hotel, Putrajaya	23 Hingga 24 Oktober
12	Jemputan pameran bas bergerak sempena Jambori di udara	Persekutuan Pengakap Malaysia Negeri Johor	SK Taman Kota Kulai 2, Johor	20 Oktober
13	Jemputan mengadakan pameran sempena Hari Hijau LLM 2018	Lembaga Lebuhraya Malaysia	Dewan Serbaguna LLM	24 Oktober
14	Jemputan pameran sempena National Seminar on Palm Oil Milling, Refining, Environment and Quality	MPOB	The Royale Chulan Hotel, Kuala Lumpur	27 Hingga 28 November
15	Jemputan pameran sempena program kesedaran kepenggunaan dan lestari alam sekitar peringkat daerah Hulu Langat tahun 2018	Pejabat Pendidikan Daerah Hulu Langat	SMK Bandar Baru Sungai Long	8 November
16	Jemputan pameran sempena HSE Day	Hanhwa Q Cells Sdn Bhd	Hanhwa Q Cells Sdn Bhd	5 Disember
17	Jemputan pameran sempena Seri Puteri Innovation Carnival (SPIC) 2018	Sekolah Seri Puteri	Sekolah Seri Puteri, Cyberjaya	15 November



BIL	PERKARA	PENGANJUR	LOKASI	TARIKH (2018)
18	Jemputan pameran sempena Program Tanpa Kenderaan	MPAJ	Padang Perbandaran MPAJ	11 November
19	Jemputan mengadakan pameran sempena Program Hari Integriti Bank Rakyat 2018	Bank Rakyat	Ruang Legar, Lobi Utama, Bank Rakyat	18 Disember
20	Jemputan mengadakan pameran sempena Program Hijau Bumi Tuhan	Kumpulan Perangsang Berhad	Pantai Bagan Lalang, Sepang, Selangor	23 Disember



▲ Pameran Bertemakan Alam Sekitar yang disertai oleh JAS
Environmental Exhibitions activities participated by DOE

ANUGERAH LANGKAWI-KELESTARIAN ALAM SEKITAR 2017/2018

Pengurniaan Anugerah Langkawi-Kelestarian Alam Sekitar kepada warganegara Malaysia dan organisasi di Malaysia yang telah mencapai kecemerlangan dalam bidang alam sekitar adalah salah satu daripada program yang dianjurkan oleh Jabatan Alam Sekitar (JAS) sempena Sambutan Minggu Alam Sekitar Malaysia (MASM) pada setiap tahun. Ia bermula pada tahun 1991, selaras dengan Deklarasi Langkawi yang telah ditandatangani oleh Ketua-Ketua Negara Komanwel pada tahun 1989. Pencalonan anugerah ini dibuka kepada ahli-ahli Majlis Kualiti Alam Sekeliling (EQC), Kerajaan Negeri, Syarikat-Syarikat Berkaitan Kerajaan (GLC) dan Swasta, Pertubuhan-Pertubuhan Bukan Kerajaan, Institut Pengajian Tinggi Awam/Swasta dan semua Kementerian yang sebahagiannya adalah Rakan Strategik JAS. Penerima anugerah ini akan menerima sijil pengiktirafan daripada Seri Paduka Baginda Yang Di-Pertuan Agong, plak penghargaan daripada Menteri Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim dan wang tunai.

Bagi tahun 2017/2018 adalah merupakan penganugerahan kali ke 22 dan proses pencalonan telah dilaksanakan pada awal tahun 2018, manakala sesi penganugerahan pula telah diadakan pada 8 November 2018 di Putrajaya Marriott Hotel sempena sambutan Hari Alam Sekitar Negara (HASN) 2018. Penerima anugerah bagi kategori individu ialah YBhg. Prof. Dato' Dr. Mazlin bin Mokhtar, Felo Utama, Institut Alam Sekitar dan Pembangunan (LESTARI) manakala penerima bagi kategori organisasi ialah Sime Darby Plantation Berhad.

LANGKAWI AWARD-ENVIRONMENTAL SUSTAINABILITY 2017/2018

The Langkawi Award-Environmental Sustainability endowed to Malaysian citizens and organizations in Malaysia who/which have achieved excellence in the environmental field is one of the programs organized by the Department of Environment (DOE) in conjunction with Malaysian Environment Week (MASM) annually. The program started in 1991, in line with the Langkawi Declaration signed by the Heads of State of the Commonwealth in 1989. The award nomination is open to the members of the Environmental Quality Council (EQC), the State Government, GLCs companies and private organizations, non-governmental bodies, public/private institutes of higher education and government agencies, all of which are mostly Strategic Partners of the DOE. This award consists of a certificate of recognition from Seri Paduka Baginda Yang Di-Pertuan Agong, a plaque of appreciation from the Minister of Energy, Science, Technology, Environment and Climate Change as well as cash prize.

In the year 2017/2018 which also marked the 22nd Langkawi Award-Environmental Sustainability, the nomination process was implemented in early 2018, whilst the award session was held on November 8, 2018 at Putrajaya Marriott Hotel in conjunction with National Environment Day (HASN) 2018. The recipient for the individual category was Hon. Prof. Dato' Dr. Mazlin bin Mokhtar, Distinguished Fellow, Institut Alam Sekitar dan Pembangunan (LESTARI) while the recipient for the organization/association category was Sime Darby Plantation Berhad.





▲ Penerima Anugerah Langkawi-Kelestarian Alam Sekitar 2017/2018 Kategori Individu
 Recipient of Langkawi Awards-Environmental Sustainability 2017/2018 Individual Category



▲ Penerima Anugerah Langkawi-Kelestarian Alam Sekitar 2017/2018 Kategori Organisasi
 Recipient of Langkawi Awards-Environmental Sustainability 2017/2018 Category of Organizations

PROGRAM KESEDARAN ALAM SEKITAR BERSEMPENA DENGAN HARI BUMI 2018

Hari Bumi disambut pada 22 April setiap tahun oleh masyarakat di seluruh dunia. Ianya bermula sebagai satu gerakan di Amerika sejak 1970an yang bertujuan meningkatkan kesedaran serta melibatkan penyertaan orang awam dalam usaha ke arah pemeliharaan dan pemuliharaan alam sekitar serta menarik minat masyarakat setempat untuk mengambil tahu, memahami dan seterusnya menghayati mesej alam sekitar yang ingin disampaikan.

Tema Hari Bumi pada tahun 2018 adalah "Hentikan Pencemaran Plastik". Tema ini dipilih bertujuan untuk mengubah sikap dan kelakuan orang awam terhadap penggunaan plastik dan seterusnya menjadi pemangkin untuk mengurangkan pencemaran yang berpunca dari buangan plastik. Pendekatan yang diambil dalam usaha untuk menghentikan pencemaran plastik dijangka akan:

1. Menyokong global framework dari peringkat asas dalam mengawal pencemaran plastik;
2. Mendidik dan menggerakkan orang awam untuk menggalakkan pihak kerajaan dan swasta mengawal dan seterusnya mengurangkan pencemaran plastik;
3. Menggalakkan orang awam untuk mempunyai rasa tanggungjawab untuk mengurangkan pencemaran dari plastik dengan mengurangkan, mengguna semula dan mengitar semula plastik;
4. Menggalakkan pelaksanaan undang-undang oleh pihak berkuasa tempatan dan juga lain-lain usaha bagi menangani pencemaran plastik.

ENVIRONMENTAL AWARENESS PROGRAM IN CONJUNCTION WITH EARTH DAY 2018

Earth Day is celebrated on April 22 every year by communities around the world. It started as a movement in the United States since 1970s, aimed to raise awareness and involving public towards preservation and conservation of the environment. It is also to attract the local communities to made aware, understand and further appreciate the delivered environmental message.

The theme of Earth Day 2018 is "End Plastic Pollution". This theme was chosen to change the attitude and behavior of the public on the use of plastic and thus become the catalyst to reduce the pollution caused by plastic waste. The approaches taken are expected to:

1. Lead a grassroots movement to support the adoption of a global framework to regulate plastic pollution;
2. Educate, mobilize and activate citizens across the globe to demand that governments and corporation control and clean up plastic pollution;
3. Educate people worldwide to take personal responsibility for plastic pollution by choosing to reduce, refuse, reuse, recycle and remove plastics and
4. Promote local government regulatory and other efforts to tackle plastic pollution.



Di Malaysia, pelbagai aktiviti bertemakan alam sekitar dianjurkan oleh pelbagai pihak bersempena dengan Hari Bumi 2018. Kementerian Sumber Asli dan Alam Sekitar melalui Jabatan Alam Sekitar telah menganjurkan Program Pengumpulan Buangan Elektrik Dan Elektronik Isi Rumah (*Household E-Waste*) di Kuala Lipis, Pahang pada 13 April 2018 dan telah disempurnakan oleh Ketua Setiausaha Kementerian Sumber Asli dan Alam Sekitar. Program tersebut juga turut diadakan di Kuching, Sarawak pada 5 Mei 2018 dan dirasmikan oleh YB Menteri Sumber Asli dan Alam Sekitar. Program Pengumpulan Buangan Elektrik Dan Elektronik Isi Rumah ini bertujuan untuk meningkatkan kesedaran orang awam mengenai pengurusan dan pelupusan e-waste secara selamat. Jenis-jenis e-waste yang dikumpulkan termasuklah televisyen, penyaman udara, mesin basuh, peti sejuk, komputer, telefon bimbit dan peralatan-peralatan elektrik kecil yang lain. Selain itu, bersempena dengan Hari Bumi 2018 ini juga, Kementerian Sumber Asli dan Alam Sekitar melalui Jabatan Perhutanan Semenanjung Malaysia dengan kerjasama Jabatan Alam Sekitar dan agensi lain di bawahnya juga telah menganjurkan Program Restorasi Hutan Bersama Rakyat Daerah Tangkak pada 22 April 2018. Program tersebut telah dirasmikan oleh YB Timbalan Menteri Sumber Asli dan Alam Sekitar.

Pelbagai program kesedaran alam sekitar juga dianjurkan oleh Jabatan Alam Sekitar Negeri bersempena dengan Hari Bumi 2018. Antaranya adalah *plogging* di pantai, seminar, pameran dan *enviro-hiking*. Selaras dengan tema Hari Bumi 2018 iaitu "Hentikan pencemaran plastik", penggunaan plastik sekali guna seperti penyedut minuman, bekas makanan dan bag plastik dikurangkan seboleh mungkin sepanjang program dijalankan. Masyarakat juga adalah digalakkan untuk tidak menggunakan plastik sekali guna bagi mengurangkan dan seterusnya mengelakkan pencemaran yang berpunca dari plastik.

In Malaysia, various environmental related activities from various parties were being conducted in conjunction with Earth Day 2018. The Ministry of Natural Resources and Environment through the Department of Environment organized a Household Electrical and Electronic Waste Collection Program in Kuala Lipis, Pahang on 13 April 2018 and was officiated by Secretary General of the Ministry of Natural Resources and Environment. The program was also conducted in Kuching, Sarawak on 5 May 2018 and was officiated by YB Minister of Natural Resources and Environment. The Household Electrical and Electronic Waste Collection Program was aimed to raise public awareness on the proper management and safe disposal of e-waste. The types of e-waste collected include television, air conditioning, washing machine, refrigerator, computer, handphone and other small appliances. Other than that, in conjunction with the Earth Day 2018, Ministry of Natural Resources and Environment through Forestry Department of Peninsular Malaysia in collaboration with the Department of Environment and other agencies has conducted Forest Restoration Program with Community of Tangkak District on 22 April 2018. The program has been officiated by YB Deputy Minister of Natural Resources and Environment.

Various environmental awareness program has also organized by the State Department of Environment in conjunction with Earth Day 2018. Among them are beach plogging, seminars, exhibitions and enviro-hiking. In line with the theme of Earth Day 2018, "End Plastic Pollution", the use of single-use plastic such as plastic straw, food containers and bags were being reduced as much as possible throughout the program. Communities are also encouraged to avoid using single-use plastic, to reduce and subsequently, to end plastic pollution.



▲ Aktiviti pendaftaran ahli RAS sempena Program Restorasi Hutan Bersama Rakyat Daerah Tangkak pada 22 April 2018

RAS member registration activity in conjunction with the Tangkak District People's Forest Restoration Program on April 22, 2018



▲ Aktiviti bersama gajah yang dikendalikan oleh PERHILITAN sempena Program Restorasi Hutan Bersama Rakyat Daerah Tangkak pada 22 April 2018

Activities with elephants run by PERHILITAN in conjunction with the Tangkak District People's Forest Restoration Program on April 22, 2018





▲ Ketua Setiausaha Kementerian Sumber Asli dan Alam Sekitar merasmikan Program Pengumpulan Buangan Elektrik Dan Elektronik Isi Rumah (*Household E-Waste*) di Kuala Lipis, Pahang pada 13 April 2018

Secretary-General of the Natural Resources and Environment Ministry officiates the Household E-Waste Collection Program at Kuala Lipis, Pahang on 13 April 2018



▲ Program Pengumpulan Buangan Elektrik Dan Elektronik Isi Rumah (*Household E-Waste*) di Kuala Lipis, Pahang pada 13 April 2018
Household and Household E-Waste Collection Program in Kuala Lipis, Pahang on 13 April 2018

PERTANDINGAN PIDATO ALAM SEKITAR PERINGKAT KEBANGSAAN TAHUN 2018

Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan telah diadakan pada 21 Oktober 2018 bertempat di Hengyuan Refining Company Sport Club, Port Dickson, Negeri Sembilan dan telah dirasmikan oleh Yang Berhormat Puan Isnaraissah Munirah Majilis, Timbalan Menteri Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC).

Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan 2018 merupakan salah satu Program Kesedaran Alam Sekitar yang julung kali diadakan oleh Jabatan Alam Sekitar (JAS). Pertandingan ini diadakan bersempena Sambutan Hari Alam Sekitar Negara Peringkat Kebangsaan (HASN) Tahun 2018 dengan kerjasama daripada Kementerian Pendidikan Malaysia (KPM), Dewan Bahasa dan Pustaka (DBP), Kementerian Komunikasi dan Multimedia Malaysia (KKMM) dan juga Rakan Strategik, Hengyuan Refining Company Berhad (HRC). Pelbagai program kesedaran alam sekitar yang lain juga turut dianjurkan bersempena HASN bagi memberi galakan kepada masyarakat untuk lebih mencintai alam sekitar.

Terdapat dua kategori pidato yang dipertandingkan iaitu Kategori Bahasa Melayu dan Kategori Bahasa Inggeris dan terbuka kepada pelajar Sekolah Menengah seluruh Malaysia. Pertandingan ini pada peringkat tapisan awal diadakan secara atas talian iaitu penyertaan melalui Facebook Rakan Alam Sekitar dengan mengguna pakai **#pidatoalamsekitarbm2018** bagi Kategori Bahasa Melayu dan **#pidatoalamsekitarbi2018** bagi Kategori Bahasa Inggeris. Pertandingan telah mendapat sambutan yang

NATIONAL ENVIRONMENTAL PUBLIC SPEAKING COMPETITION OF YEAR 2018

The National Environmental Public Speaking Competition was held on 21st October 2018 at the Hengyuan Refining Company Sport Club, Port Dickson, Negeri Sembilan and was officiated by Yang Berhormat Puan Isnaraissah Munirah Majilis, Deputy Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC).

The National Environmental Public Speaking Competition is one of the Environmental Awareness Programs by the Department of Environment (DOE). The competition was held in conjunction with the National Environment Day (HASN) of 2018 in collaboration with Ministry of Education Malaysia (KPM), Dewan Bahasa dan Pustaka (DBP), Ministry of Communication and Multimedia Malaysia (KKMM) and Strategic Partnership, Hengyuan Refining Company Berhad (HRC). There are various other environmental awareness programs are also organized in conjunction with HASN to encourage the community to love and appreciate the nature.

There are two categories involve in this public speaking competition namely the Malay Category and the English Category and opened to all Malaysian Secondary students. The initial screening stage is held online whereby the participation is via Facebook: Facebook Rakan Alam Sekitar by applying **#pidatoalamsekitarbm2018** for the Malay Category and **#pidatoalamsekitarbi2018** for English Category. Competition has received a very encouraging response in which about 214 entries has been submitted



sangat menggalakkan iaitu sebanyak 214 penyertaan diterima melalui Borang Google/Google Form dan telah dinilai pada peringkat tapisan awal. Barisan panel hakim bagi peringkat tapisan awal terdiri daripada pegawai-pegawai dari JAS dan juga KKMM. Sepuluh (10) pelajar bagi setiap kategori telah melepasi tapisan awal dan kemudian bertanding secara langsung di pentas akhir. Senarai nama pelajar yang layak ke peringkat akhir adalah seperti **Jadual 5.1** dan **Jadual 5.2**.

via Google Forms. The judges for initial screening stage consist of officers from DOE and KKMM. Ten (10) students in each category have passed the initial screening stage and then competed live on the final stage. Among the list of students eligible to the final stage are as **Table 5.1** and **Table 5.2**.

Jadual 5.1 : Senarai Peserta Peringkat Akhir Kategori Bahasa Inggeris
Table 5.1 : Finalist of English Category

BIL	NAMA PELAJAR	NAMA SEKOLAH
1	Ainna Ammira Binti Fauzan	SMK Seksyen 16 Shah Alam
2	Hafiz Bin Daud	SMK Seksyen 16, Shah Alam
3	Haieshwaryya Laxmy a/p Rajendren	SMK Pasir Gudang
4	Iman Nisreen Binti Nazrul Hadi	SMK Ahmad
5	Intan Amani Binti Taufik	SM Imtiaz YT Dungun
6	Nurnazifa Binti Muhammad Fauzi	SM Sains Dungun
7	Nurulhanisa Binti Mohd Ikhsan	SMK Pasir Gudang
8	Sharifa Najjah	SM Sains Labuan, Wilayah Persekutuan Labuan
9	Yasmeen Binti Haniff Mirza	SMK Damansara Jaya
10	Zuhrah Atika Binti Zulkefli	SM Sains Dungun

Jadual 5.2 : Senarai Peserta Peringkat Akhir Kategori Bahasa Melayu
Table 5.2 : Finalist of Malay Category

BIL	NAMA PELAJAR	NAMA SEKOLAH
1	Aleeya Maisarah Binti Ahmad Anuar	SMK Taman Tasik Taiping
2	Aufa Nur Nabila Binti Anuar	Maahad Tahfiz Sains Darul Aman
3	Ayuni Hazirah Binti Daniel Liting	SMK Sarikei Baru
4	Haifa Fadhilah Binti Suhaili Kamal	SMK Seksyen 16, Shah Alam
5	Ida Syazwani Binti Mohamad Annuar	SMK Dato Kamaruddin, Batu Kurau
6	Muhammad Amin Bin Noor Azam	SMK Tengku Suleiman, Perlis
7	Noor Amanina Binti Zakaria	SMK Dato Kamaruddin
8	Nurien Aina Binti Ahmad Marzuki	SMK Seksyen 16
9	Yasmin Suffiyah Binti Muhammad Ilias	SMKA (P) Alawiyah Kangar, Perlis.
10	Zulkifli Bin Salehudin	SMK Seksyen 16 Shah Alam

Hadiah tempat pertama atau johan bagi Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Tahun 2018 telah membawa pulang wang tunai berjumlah RM1,000.00 beserta sijil penghargaan dan Plak. Manakala tempat kedua atau naib johan menerima wang tunai berjumlah RM800.00 beserta sijil penghargaan dan plak dan tempat ketiga menerima wang tunai berjumlah RM600.00 beserta sijil penghargaan dan plak. Bagi hadiah saguhati iaitu dari tempat keempat sehinggalah kesepuluh pula menerima wang tunai berjumlah RM200.00 beserta sijil penghargaan. Senarai nama pemenang bagi kedua-dua kategori adalah seperti **Jadual 5.3** dan **Jadual 5.4**.

The first prize for The National Environmental Public Speaking Competition Year 2018 has received the prize money worth RM1,000.00 with a certificate of appreciation and plaque. The second place received prize money worth RM800.00 with a certificate of appreciation and plaque and third place received prize money worth RM600.00 with a certificate and plaque. For consolation prizes from fourth to tenth, received prize money worth RM200.00 with a certificate of appreciation. List of winner for both categories is as **Table 5.3** and **Table 5.4**.



▲ Peserta Akhir Pertandingan Pidato Alam Sekitar
Finalist National Environment Public Speaking Competition

Jadual 5.3 : Senarai Pemenang Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Tahun 2018 Kategori Bahasa Inggeris

Table 5.3 : List of Winner of English Category

	NAMA PELAJAR	NAMA SEKOLAH
JOHAN	Yasmeeen Binti Haniff Mirza	SMK Damansara Jaya
NAIB JOHAN	Nurulhanisa Binti Mohd Ikhsan	SMK Pasir Gudang
TEMPAT KETIGA	Intan Amani Binti Taufik	SM Imtiaz YT Dungun



Jadual 5.4 : Senarai Pemenang Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Tahun 2018 Kategori Bahasa Melayu

Table 5.4 : List of Winner of Malay Category

	NAMA PELAJAR	NAMA SEKOLAH
JOHAN	Ayuni Hazirah Binti Daniel Liting	SMK Sarikei Baru
NAIB JOHAN	Yasmin Suffiyah Binti Muhammad Ilias	SMKA (P) Alawiyah Kangar, Perlis.
TEMPAT KETIGA	Noor Amanina Binti Zakaria	SMK Dato Kamaruddin

Penyampaian hadiah kepada Pemenang Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Tahun 2018 telah disempurnakan oleh YB Timbalan Menteri MESTECC sambil diiringi oleh Yang Berbahagia Dato' Dr. Ahmad Kamarulnajuib Bin Che Ibrahim, Ketua Pengarah Alam Sekitar Malaysia dan disaksikan oleh Yang Berbahagia Datuk Kua Abun, Timbalan Ketua Setiausaha Perancangan dan Pengkomersialan MESTECC, Yang Berusaha Profesor Madya Dr. Ramzah Dambul, Timbalan Ketua Setiausaha Sains, Teknologi dan Inovasi (STI) MESTECC dan Encik David Keat, Ketua Pegawai Eksekutif (CEO) HRC.

The prize presentation to the Winner of The National Environmental Public Speaking Competition Year 2018 was delivered by YB Deputy Minister of MESTECC while accompanied by the Honorable Dato' Dr. Ahmad Kamarulnajuib Bin Che Ibrahim, Director-General of Environment Malaysia and witnessed by the Honorable Datuk Kua Abun, Deputy Secretary-General Planning and Commercial Planning MESTECC, the Honorable Professor Dr. Ramzah Dambul, Deputy Secretary-General of Science, Technology and Innovation (STI) MESTECC and Encik David Keat, Chief Executive Officer (CEO) of HRC.



▲ Johan Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Kategori Bahasa Melayu

1st Prize of The National Environmental Public Speaking Competition for Malay Category



▲ Peserta Akhir Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Kategori Bahasa Melayu

Finalist of The National Environmental Public Speaking Competition for Malay Category



▲ Johan Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Kategori Bahasa Inggeris
1st Prize of The National Environmental Public Speaking Competition for English Category



▲ Peserta Akhir Pertandingan Pidato Alam Sekitar Peringkat Kebangsaan Kategori Bahasa Inggeris
Finalist of The National Environmental Public Speaking Competition for English Category

AKTIVITI PERPUSTAKAAN JABATAN ALAM SEKITAR BAGI 2018

Perpustakaan Jabatan Alam Sekitar telah melaksanakan 10 aktiviti sepanjang tahun 2018. Aktiviti yang dilaksanakan ini adalah untuk memupuk kalangan kakitangan Jabatan Alam Sekitar supaya minat membaca dan kreatif dalam pengurusan maklumat. Ia juga adalah untuk menyahut seruan kerajaan kearah pekerja berpengatahuan dalam bidang kepakaran masing-masing.

DOE LIBRARY ACTIVITY FOR 2018

The Department of Environment has implemented 10 activities for the whole of 2018. The activities is to foster the Department of Environment's staff for reading and creative interest in information management. It is also to respond to the government's call towards knowledge workers in their respective field of expertise.



▲ Jom baca bersama untuk 10 minit pada 24 April 2018
Let's read with 10 minutes on 24th April 2018



▲ Lawatan ke Pesta Buku Antarabangsa Kuala Lumpur 2018 di PWTC pada 3 Mei 2018
KL International Book Fair PWTC visit on May 3, 2018



▲ Peraduan Teku jumlah Buku Bersempena Program Baca Bersama 10 Minit - Siri 1 pada 16 Mei 2018
Contest Guest The Number Of Books in Conjunction With 10 Minutes Read Together on May 16, 2018



▲ Jom Baca Bersama untuk 10 minit Bersempena Perhimpunan Bulanan Bil.3/2018 pada 16 Mei 2018
Read Together for 10 minutes In conjunction with the Monthly Assembly No. 3/2018 on May 16, 2018



► Teka jumlah Buku Bersempena Perhimpunan Bulanan Bil.6/2018 – Siri 2 pada 7 November 2018
Guess the number of Books in conjunction with the Monthly Gathering No. 6/2018 – Series 2 on November 7, 2018

► Pinjaman Buku Berkelompok di Perpustakaan Negara Malaysia (PNM) pada 1 November 2018
Group Book Loan at the National Library of Malaysia (PNM) on 1st November 2018

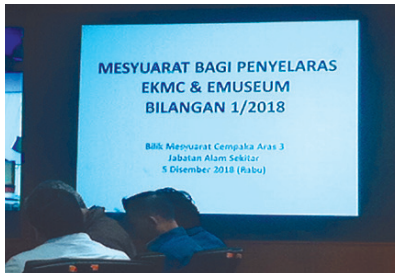


► Bengkel Fotofon bersempena Bulan Literasi Maklumat Perpustakaan JAS pada 15 dan 16 November 2018
Fotofon Workshop in conjunction with the Literary Month Information Library Literacy on 15 and 16 November 2018





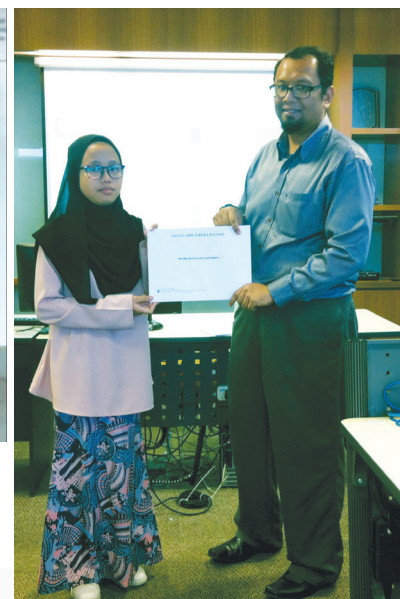
► Mesyuarat & Bengkel bagi Penyelaras EKMC & EMUSEUM. Bil.1/2018 pada 5 Disember 2018
Meetings & Workshops for EKMC & EMUSEUM Coordinators. No. 1/2018 on 5 December 2018



► Kem ICT Sekolah Rendah pada 13 Disember 2018 di bilik ICT, BTM
Primary School ICT Camp on December 13, 2018 in ICT room, BTM



► Kem ICT Sekolah Menengah pada 17 Disember 2018 di bilik ICT, BTM
Secondary School ICT Camp on December 17, 2018 in ICT room, BTM



STATISTIK PENGGUNAAN PERKHIDMATAN DI PERPUSTAKAAN JABATAN ALAM SEKITAR 2018

Peningkatan pengguna kepada perkhidmatan perpustakaan Jabatan Alam Sekitar sangat meningkat berbanding tahun sebelumnya. Jika dilihat pada tahun 2018 jumlah pengguna perpustakaan mengikut kategori adalah 5,5875 (**Rujuk Rajah 5.1**) termasuk perkhidmatan Offline & Online. Ini menunjukkan Perpustakaan JAS memainkan peranan sangat penting dalam kerja-kerja pengurusan alam sekitar di Malaysia sebagai rujukan utama.

Pengguna online terus meningkat terutama pengguna perkhidmatan seperti EKMC, EMUSEUM dan E-Library. **Rujuk Rajah 5.2, 5.3, 5.4, 5.5 dan 5.6.**

EKMC adalah repositori kepada penerbitan Jabatan Alam Sekitar secara digital. Manakala EMUSEUM adalah perkhidmatan repositori aktiviti JAS yang dilaksanakan setiap tahun termasuk program, pameran, pengawasan, penguatkuasaan, seminar dan acara tahunan yang lain melibatkan Jabatan Alam Sekitar.

E-library pula adalah rekod maklumat bahan rujukan yang ada di perpustakaan bagi membantu memudahkan pengurusan dan carian bahan rujukan di Perpustakaan dengan cepat dan mudah.

STATISTICS ON USE OF SERVICES IN THE DEPARTMENT OF ENVIRONMENT LIBRARY 2018

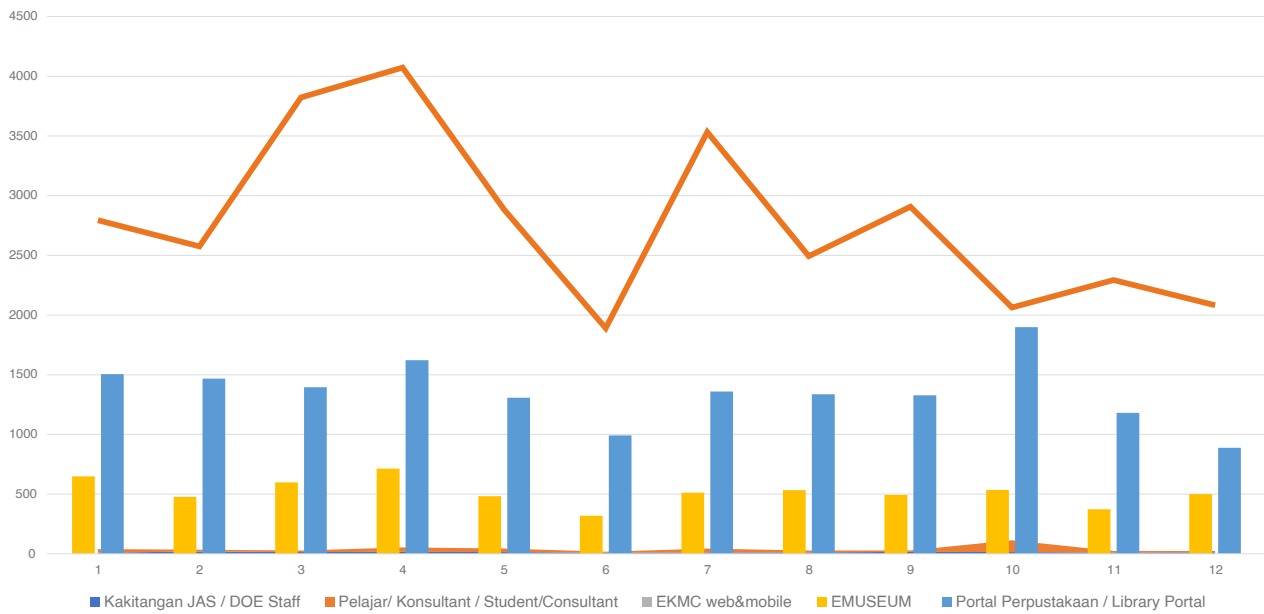
The increase of users to the Department of Environment's library services has increased significantly over the previous year. If seen in 2018 the number of library users by category is 55875 (**Refer to Figure 5.1**) including Offline & Online services. This shows that DOE Library plays a very important role in environmental management work in Malaysia as a major reference.

Online users continue to increase especially the users of services such as EKMC, EMUSEUM and E-Library. Refer to **Figure 5.2, 5.3, 5.4, 5.5 and 5.6.**

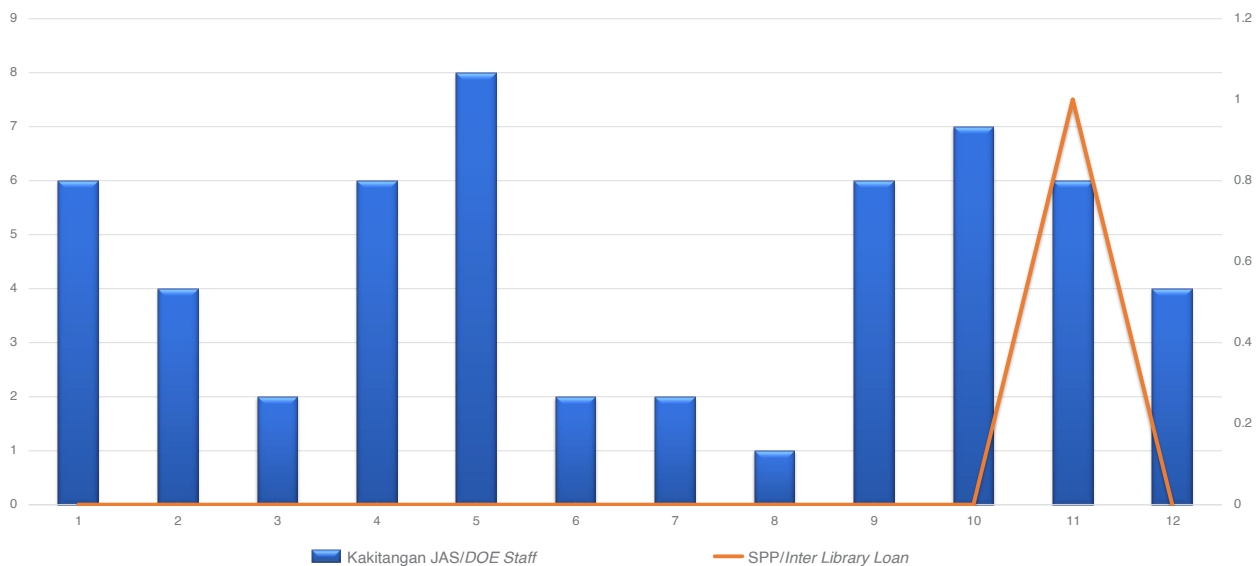
EKMC is a repository of Digital Department publications. While EMUSEUM is a service repository of DOE activities performed annually including programs, exhibitions, surveillance, enforcement, seminars and other annual events involving the Department of Environment.

The E-library is a library of reference materials available in the library to help facilitate the management and search of reference materials in the Library quickly and easily.

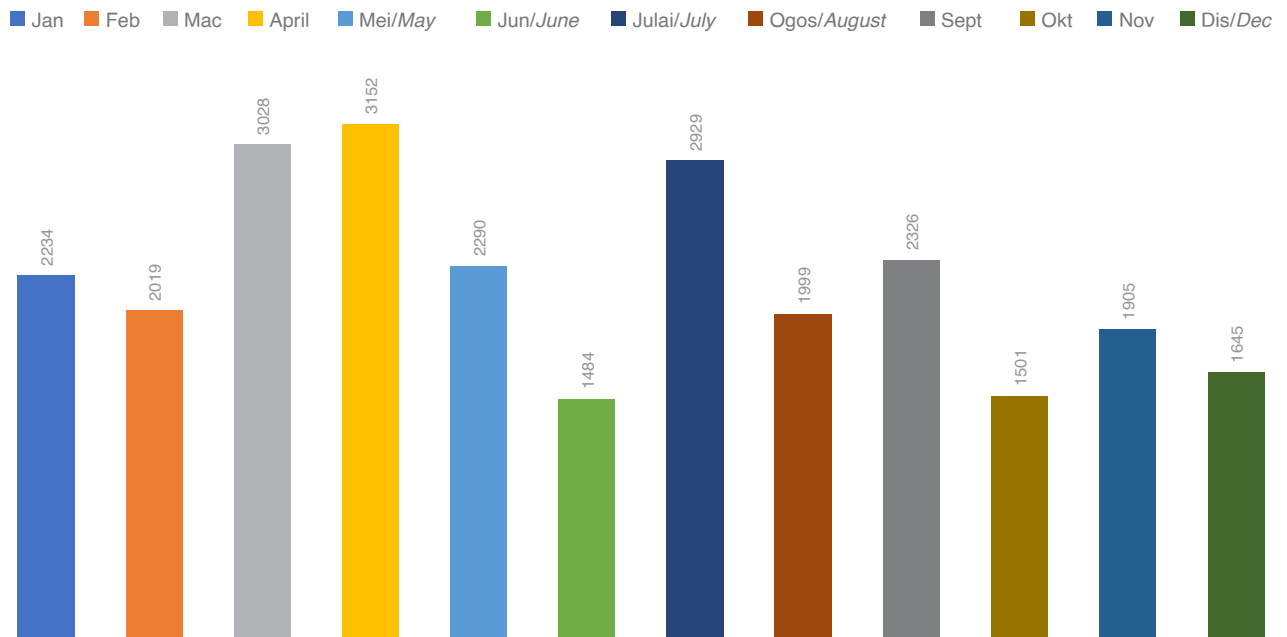




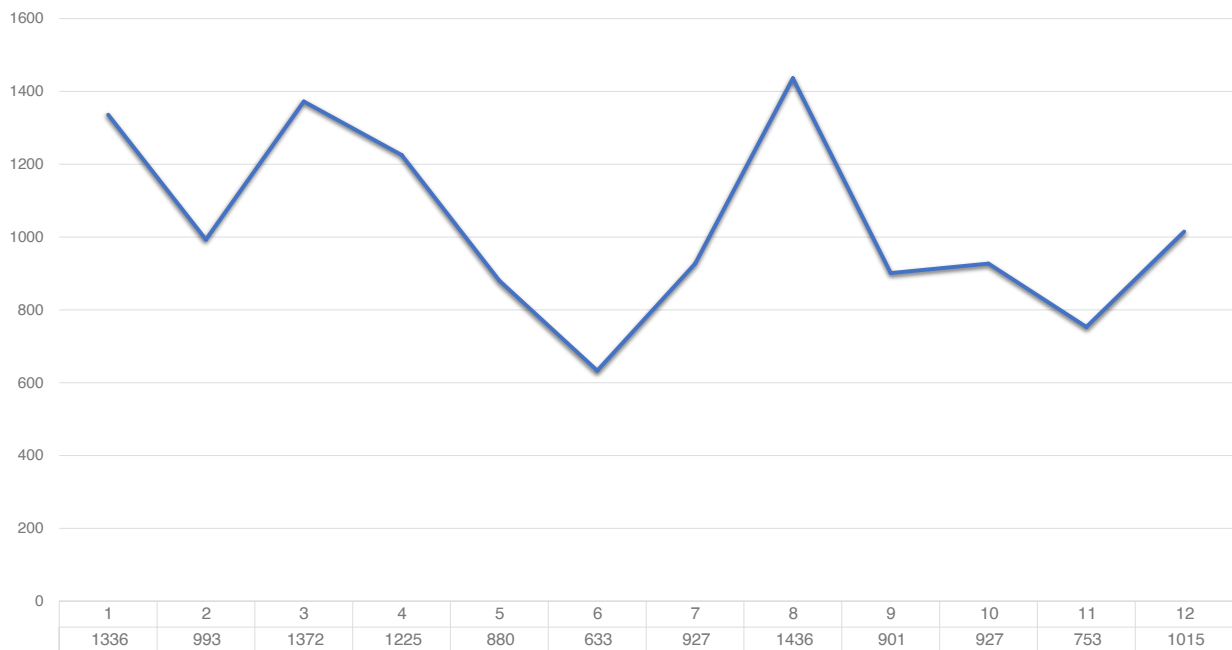
Rajah 5.1 : Jumlah pengguna perpustakaan mengikut kategori
Figure 5.1 : Number of library users by category



Rajah 5.2 : Pinjaman bahan rujukan di kalangan kakitangan JAS
Figure 5.2 : Reference materials loans among DOE staff

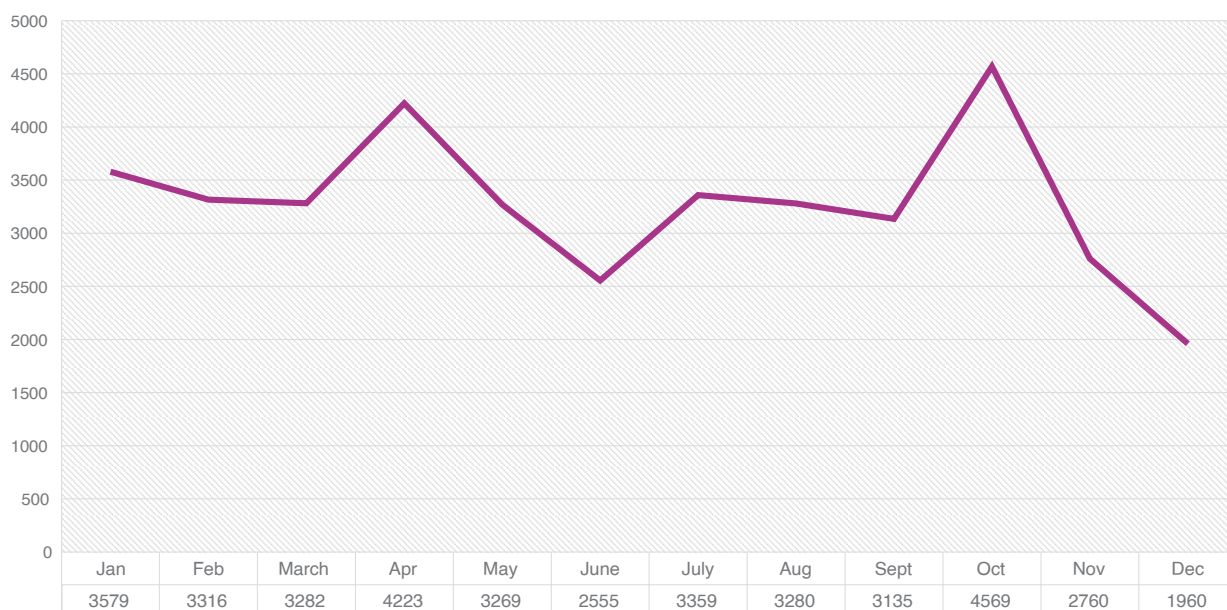


Rajah 5.3 : Jumlah pembaca di EKMC (*Enviro Knowledge Management Center*)
 Figure 5.3 : The total of readers on EKMC

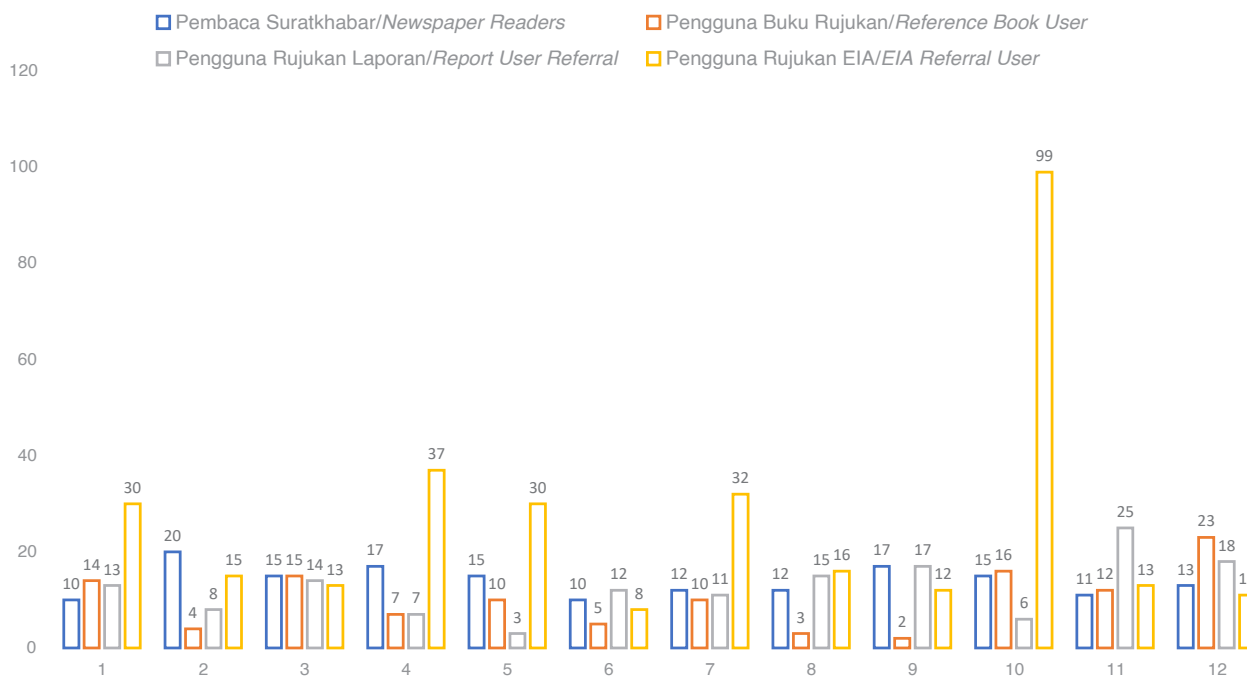


Rajah 5.4 : Jumlah pembaca di EMUSEUM
 Figure 5.4 : Total of readers on EMUSEUM





Rajah 5.5 : Jumlah pembaca di Portal Perpustakaan
Figure 5.5 : The total of readers on Library Portal



Rajah 5.6 : Jumlah pengguna membuat rujukan di perpustakaan mengikut kategori
Figure 5.6 : Number of users making reference in library by category

BAB 6

CHAPTER 6



HAL EHWAL ALAM SEKITAR ANTARABANGSA – KERJASAMA DUA HALA

Mesyuarat Ke-16 Kumpulan Kerja Jawatankuasa Bersama Malaysia – Singapura mengenai Alam Sekitar (MSJCE WG)

Mesyuarat Ke-16 Kumpulan Kerja Jawatankuasa Bersama Malaysia – Singapura mengenai Alam Sekitar (WG of MSJCE) telah diadakan pada 18-19 Julai 2018 di Putrajaya, Malaysia. YBhg. Dato' Ahmad Kamarulnajib bin Che Ibrahim, Ketua Pengarah Alam Sekitar, Malaysia dan Encik Ronnie Tay, Ketua Pegawai Eksekutif, National Environment Agency, Singapura telah mempengerusikan bersama Mesyuarat berkenaan.

Seramai 35 orang delegasi dari pelbagai agensi Malaysia seperti Kementerian Luar Negeri, Jabatan Peguam Negara, Jabatan Pengaliran dan Saliran, Unit Perancang Ekonomi Negeri Johor, Jabatan Laut Malaysia, Lembaga Pelabuhan Johor dan wakil dari Kementerian Sumber Asli dan Alam Sekitar telah menghadiri Mesyuarat ini.

Sementara itu, seramai 32 orang wakil delegasi Singapura yang terdiri daripada pelbagai agensi di antaranya *Public Utilities Board, Ministry of National Development, Ministry of Foreign Affairs, Housing and Development Board, Maritime and Port Authority, Ministry of the Environment and Water Resources*.

Mesyuarat ini berperanan penting untuk kedua-dua negara bertukar-tukar maklumat dan pengalaman dalam menangani isu-isu alam sekitar yang berkepentingan bersama.

INTERNATIONAL ENVIRONMENTAL AFFAIRS – BILATERAL COOPERATION

The 16th Meeting of the Malaysia – Singapore Joint Committee on the Environment Working Group (MSJCE WG)

The 16th Meeting of the Malaysia – Singapore Joint Committee on the Environment (MSJCE) Working Group (WG of MSJCE) was held on 18-19 July 2018 in Putrajaya, Kuala Lumpur. Dato' Ahmad Kamarulnajib bin Che Ibrahim, Director-General of Environment, Malaysia and Mr. Ronnie Tay, Chief Executive Officer, National Environment Agency, Singapore co-chaired the Meeting.

A total of by 35 delegates from various agencies from Malaysia namely Ministry of Foreign Affairs, Attorney General's Chambers, Department of Irrigation and Drainage, Johor State Economic Planning Unit, Marine Department, Johor Port Authority and a representative from Ministry Natural Resources and Environment attended the Meeting.

Meanwhile, Singapore was represented by 32 delegates from different agencies namely Public Utilities Board, Ministry of National Development, Ministry of Foreign Affairs, Housing and Development Board, Maritime and Port Authority, Ministry of the Environment and Water Resources.

This Meeting serves an important role for both countries to exchange information and experiences in tackling environmental issues of mutual interest.



Mesyuarat Ke-16 Kumpulan Kerja Jawatankuasa Besama Malaysia-Singapura mengenai Alam Sekitar (MSJCE WG) pada 18 Julai – 19 Julai 2018 di Malaysia
 The 16th Malaysia-Singapore Joint Committee on the Environment Working Group Meeting (MSJCE WG) on 18th July – 19th July in Malaysia

Malaysia – Republik Indonesia

Lawatan Menanda Aras Akademi Pemimpin Pembaharuan, Lembaga Administrasi Negara (LAN), Kementerian Alam Sekitar dan Perhutanan, dan Pemerintah Provinsi

Pada 28 Ogos 2018, Jabatan Alam Sekitar Malaysia melalui Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC) telah menerima kunjungan seramai 30 ahli perwakilan dari Republik Indonesia. Perwakilan Indonesia diketuai oleh Dr. Muhamad Idris, Timbalan Pengerusi Lembaga Administrasi Negara (LAN).

Kunjungan ini bertujuan untuk mendapatkan pengetahuan dan memahami dasar dan program pembangunan hijau Malaysia bagi mencapai *Sustainable Development Goals 2030*.

Malaysia – Republic of Indonesia

Benchmarking Visit of Reform Leaders Academy Training, National Institute of Public Administration Indonesia (NIPA), Ministry of Environment and Forestry, and Provincial Governments

On 28 August 2018, the Department of Environment Malaysia through the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) received a delegation consisting of 30 members from the Republic of Indonesia. The delegation was headed by Dr. Muhamad Idris, Deputy Chairman National Institute of Public Administration Indonesia (NIPA).

The visit aimed to gain knowledge and insights on Malaysia's innovative policies and programs on green development to achieve Sustainable Development Goals 2030.



Malaysia – Republik Rakyat China

Environment Protection Department, Hubei Province, China

Satu delegasi seramai lima orang pegawai dari *Environment Protection Department, Hubei Province, China* telah mengadakan lawatan ke Jabatan Alam Sekitar, Malaysia pada 26 November 2018. Delegasi tersebut diketuai oleh Mr. Zhang Zhiyang, *Head of Pollution Control Division*.

Topik yang dibincangkan termasuklah perlindungan alam sekitar, pengurusan dan teknologi pengurangan pelepasan bahan pencemar atmosfera.

Environment Protection Bureau of Chaoyang District, Beijing Municipality, China

Pada 8 November 2018, Jabatan Alam Sekitar Malaysia telah menerima kunjungan delegasi seramai lima orang wakil dari *Environment Protection Bureau of Chaoyang District, Beijing Municipality, China*.

Kunjungan ini bertujuan untuk berkongsi pengalaman dan maklumat mengenai Kawalan Pencemaran Udara dan Pengurusan Kawalan Pelepasan Pencemaran.

Malaysia – People's Republic of China

Environment Protection Department, Hubei Province, China

A delegation of five officers from the Environment Protection Department, Hubei Province, China visited the Department of Environment Malaysia on the 26 November 2018. The delegation was led by Mr. Zhang Zhiyang, Head of Pollution Control Division.

The topics discussed includes environmental protection, technology and management on reduction of the atmospheric pollutant emissions.

Environment Protection Bureau of Chaoyang District, Beijing Municipality, China

On 8 November 2018, the Department of Environment Malaysia, received a five member delegation from the Environment Protection Bureau of Chaoyang District, Beijing Municipality, China.

The visit aimed to share experience and information on Air Pollution Control and Pollution Emission Control Management.



Lawatan dari
Environment Protection
Department, Hubei
Province, China ke
Jabatan Alam Sekitar

HAL EHWAL ALAM SEKITAR ANTARABANGSA – KERJASAMA SERANTAU

Coordinating Body On The Seas Of East ASIA (COBSEA)

Coordinating Body on the Seas of East Asia (COBSEA) merupakan organisasi kerjasama serantau antara kerajaan bagi negara-negara di laut Asia Timur yang ditubuhkan di bawah *United Nations Environment Programme (UNEP)*. COBSEA terdiri daripada sepuluh (10) buah negara iaitu Cambodia, China, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand dan Vietnam.

COBSEA berperanan dalam menyelaraskan pembentukan Pelan Tindakan Perlindungan dan Pembangunan Marin dan Persisiran Pantai Laut Asia Timur bermula tahun 1981.

Komponen utama pelan ini adalah penilaian ke atas impak dari aktiviti-aktiviti manusia ke atas persekitaran marin, kawalan pencemaran di persisiran pantai, perlindungan paya bakau, rumpai laut serta batu karang dan juga pengurusan sisa buangan.

Pada tahun 2018, Malaysia telah menghadiri *The COBSEA Regional Working Group on Marine Litter Meeting* pada 13-14 Disember 2018 di Bangkok, Thailand yang dihadiri oleh wakil daripada Bahagian Pengurusan Alam Sekitar dan Perubahan Iklim (BPASPI), Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (MESTECC) dan wakil daripada Kementerian Perumahan dan Kerajaan Tempatan (KPKT). Selain itu, Malaysia juga terlibat dalam usaha untuk

INTERNATIONAL ENVIRONMENTAL AFFAIRS – REGIONAL COOPERATION

Coordinating Body On The Seas Of East ASIA (COBSEA)

Coordinating Body on the Seas of East Asia (COBSEA) is an intergovernmental regional organization for East Asian Seas comprising of the ten (10) - member countries which are Cambodia, China, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand dan Vietnam.

Under COBSEA forum, an Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Seas Region (the East Asian Seas Action Plan) was developed and approved in 1981.

The main components of East Asian Seas Action Plan are assessment of the effects of human activities on the marine environment, control of coastal pollution, protection of mangroves, sea grasses and coral reefs, and waste management.

In 2018, Malaysia has attended the COBSEA Regional Working Group on Marine Litter Meeting on 13-14 December 2018 in Bangkok, Thailand, which were attended by representatives from the Environmental Management and Climate Change Division (BPASPI), Ministry of Energy, Science, Technology, and Environment and Climate Change (MESTECC) and a representative from the Ministry of Housing and Local Government (KPKT). In addition, Malaysia is also involved in the review



mengkaji semula *The COBSEA Regional Action Plan on Marine Litter* yang akan dibincangkan dan diputuskan dalam Mesyuarat Intergovernmental COBSEA yang ke-24 di Bangkok, Thailand pada tahun 2019.

ASEAN Working Group On Coastal And Marine Environment (AWGCME)

ASEAN Working Group on Coastal and Marine Environment (AWGCME) adalah satu kerjasama serantau yang dianggotai oleh sepuluh (10) buah negara ASEAN iaitu Brunei Darussalam, Kemboja, Indonesia, Lao PDR, Malaysia, Myanmar, Filipina, Singapura, Thailand dan Vietnam.

Mesyuarat ini juga turut melibatkan organisasi seperti ASEAN Centre for Biodiversity (ACB), *Partnerships in Environmental Management for the Seas of East Asia* (PEMSEA), *Coral Triangle Initiative-Coral Reefs, Fisheries and Food Security* (CTI-CFF) *Regional Interim Secretariat*, dan *Mangrove for Future/ International Union for Conservation of Nature* (IUCN).

Mesyuarat AWGCME kali ke-19 telah diadakan pada 19-20 Mac 2018 di Nay Pyi Taw, Myanmar. Selain itu, Malaysia juga terlibat dalam memberi input dan ulasan mengenai lapan (8) projek kerjasama ASEAN mengenai persekitaran marin dan pantai, *blue economy*, pencemaran plastik di laut, kawalan pencemaran buangan elektronik dan *coastal spatial planning*.

of the COBSEA Regional Action Plan on Marine Litter that will be discussed and endorsed at the 24th COBSEA Intergovernmental Meeting in Bangkok, Thailand in 2019.

ASEAN Working Group On Coastal And Marine Environment (AWGCME)

ASEAN Working Group on Coastal and Marine Environment (AWGCME) is a regional cooperation which involve ten (10) ASEAN countries including Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

AWGCME annual meeting is a platform to enhance collaboration among ASEAN Member States (AMS) to promote activities and policy development on marine pollution control and prevention. This meeting also participates by other organization such as ASEAN Centre for Biodiversity (ACB), *Partnerships in Environmental Management for the Seas of East Asia* (PEMSEA), *Coral Triangle Initiative-Coral Reefs, Fisheries and Food Security* (CTI-CFF) *Regional Interim Secretariat* and *Mangrove for Future/ International Union for Conservation of Nature* (IUCN).

The 19th AWGCME meeting was held from 19-20 March 2018 in Nay Pyi Taw, Myanmar and was attended by a representative from Department of Environment (DOE). In addition, Malaysia is also involved in providing inputs and reviews on eight (8) ASEAN cooperation projects on marine and coastal environments, blue economy, marine plastic pollution, electronic waste pollution control and coastal spatial planning.

Malaysia turut dijemput untuk menghadiri *Regional Workshop On ASEAN Cooperation Project "The ASEAN Mechanism to Enhance Surveillance against Illegal Desludging and Disposal of Tanker Sludge at Sea"* pada 17-19 April di Batam, Indonesia dan *Regional Workshop "Managing Packaging Waste – Preventing Marine Litter"* pada 30 Oktober – 1 November di Bali, Indonesia.

Bay Of Bengal Large Marine Ecosystem (BOBLME)

Bay of Bengal Large Marine Ecosystem (BOBLME) adalah projek kerjasama serantau yang melibatkan lapan (8) buah negara di persisiran Teluk Bengal iaitu Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka dan Thailand. Projek ini dibentuk bertujuan menambahbaik kehidupan penduduk pantai menerusi kerjasama pengurusan perikanan dan alam sekitar di peringkat serantau.

Projek BOBLME ini telah bermula semenjak April 2009 di mana *Food and Agriculture Organization (FAO)* adalah agensi pelaksana (*executing agency*). Jabatan Perikanan Malaysia merupakan agensi penyelaras (*National Coordinator*) bagi peringkat Malaysia. Ketua Pengarah Alam Sekitar telah dilantik sebagai *Project Steering Committee (Environment)* dan Ketua Pengarah Perikanan sebagai *Project Steering Committee (Fisheries)* untuk Malaysia di bawah projek ini.

Output utama projek BOBLME adalah menghasilkan satu *Strategic Action Programme (SAP)* untuk rantau ini. SAP tersebut telah dipersetujui dan ditandatangani oleh Ketua Setiausaha Kementerian Pertanian dan Industri Asas Tani dan Ketua Setiausaha Kementerian Sumber Asli dan Alam Sekitar pada 28 Ogos 2015.

Malaysia is also invited to attend the *Regional Workshop on ASEAN Cooperation Project "The ASEAN Mechanism to Enhance Surveillance against Illegal Desludging and Disposal of Tanker Sludge at Sea"* on 17-19 April in Batam, Indonesia and *Regional Workshop "Managing Packaging Waste – Preventing Marine Litter"* on October 30 – November 1 in Bali, Indonesia.

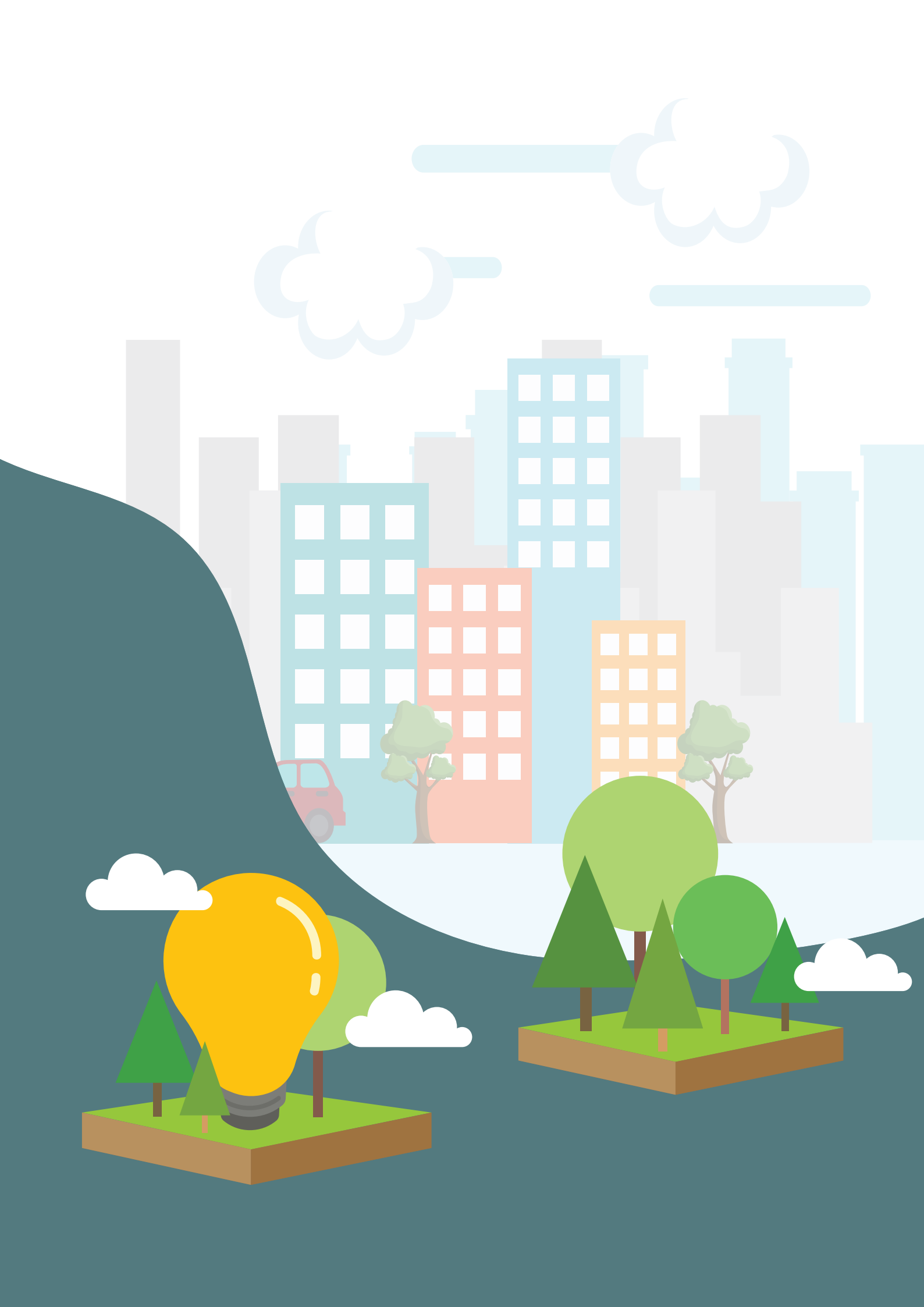
Bay Of Bengal Large Marine Ecosystem (BOBLME)

Bay of Bengal Large Marine Ecosystem (BOBLME) is a regional cooperation project comprises of eight countries surrounding the Bay of Bengal namely Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand. The aim of Bay of Bengal Large Marine Ecosystem (BOBLME) Project is to improve the lives of the coastal populations through improved regional management of the Bay of Bengal environment and its fisheries.

The BOBLME Project was initiated in April 2009 and the Food and Agriculture Organization FAO is the executing agency. Department of Fisheries is the National Coordinator for Malaysia. Director General of Department of Environment and Director General of Department of Fisheries had been appointed as Project Steering Committee (Environment) and Project Steering Committee (Fisheries) for Malaysia, respectively.

The main output of BOBLME Project is to develop regional Strategic Action Programme (SAP). This SAP was agreed and signed by the Secretary General, Ministry of Agriculture and Agro-Based Industry and Ministry of Natural Resources and Environment on 28th August 2015.





BAB 7

CHAPTER 7



PENGURUSAN TEKNOLOGI MAKLUMAT INFORMATION TECHNOLOGIES (IT) MANAGEMENT

Aktiviti Pembangunan Aplikasi 2018

MYCEP

Malaysian Certified Environmental Practitioner System

| Objektif

Membangunkan sistem pendaftaran online bagi jururunding mendaftar dengan JAS dan seterusnya mengurusperdanakan alam sekitar melalui kaedah pematuhan sendiri

| Aktiviti

Bengkel URS dan Sesi Coaching

| Bahagian

Bahagian Penilaian dan Bahagian Teknologi Maklumat

EKMC & EMUSEUM

Enviro Knowledge Management Center & Enviro Museum

| Objektif

Menaik taraf portal EKMC dan EMUSEUM bagi menambahbaik ciri-ciri, paparan antaramuka

| Aktiviti

Bengkel URS, UAT dan FAT

| Bahagian

Bahagian Komunikasi Strategik dan Bahagian Teknologi Maklumat.

Application Development Activities In 2018

MYCEP

Malaysian Certified Environmental Practitioner System

| Objective

To develop an online registration system for environmental consultant to register with DOE through self-regulatory

| Activity

URS Workshop and Coaching Session

| Division

Assesment Division and Information Technology Division

EKMC & EMUSEUM

Enviro Knowledge Management Center & Enviro Museum

| Objective

To upgrade EKMC and EMUSEUM portals in order to improve features, interface and functionalities.

| Activity

URS, UAT and FAT Workshop

| Division

Strategic Communication Division and Information Technology Division.

LDP2M2***Land Disturbing Pollution Prevention And Mitigation Measures System*****| Objektif**

Menjenamakan semula dan menambahbaik Sistem Erosion & Sediment Control (ESC) Online sedia ada dan akan digunakan oleh penggerak projek EIA dan pegawai JAS. Sistem melibatkan aktiviti pemerolehan data pemantauan alam sekitar dan laporan secara atas talian.

| Aktiviti

Bengkel URS

| Bahagian

Bahagian Penilaian dan Bahagian Teknologi Maklumat

SPPIH***Sistem Pengurusan dan Pemantauan Industri Hijau*****| Objektif**

Membangunkan sistem bagi memantau amalan industri hijau di kalangan industri di Malaysia bagi mencapai sasaran pematuhan kepada Akta Kualiti Alam Sekeliling 1974 (AKAS 1974) serta sebagai benchmark Amalan Industri Hijau dalam sektor industri di Malaysia.

| Aktiviti

Bengkel Pra-URS

| Bahagian

Bahagian Penguatkuasa (Unit Industri Hijau) dan Bahagian Teknologi Maklumat

LDP2M2***Land Disturbing Pollution Prevention And Mitigation Measures System*****| Objective**

To improve and enhance the existing Erosion & Sediment Control (ESC) System and will be used by EIA project proponents and DOE officers. The system involves acquisition of environmental monitoring data and online reporting.

| Activity

URS Workshop

| Division

Assesment Division and Information Technology Division

SPPIH***Sistem Pengurusan dan Pemantauan Industri Hijau*****| Objective**

To develop a system to monitor green industry practices among industries in Malaysia towards complied with the Environmental Quality Act 1974 (EQA 1974) and to develop the benchmark for the Green Industrial Practice in the industrial sector in Malaysia.

| Activity

Pre-URS Workshop

| Division

Enforcement Division (Green Industry Unit) and Information Technology Division.



MYRAS **Sistem Rakan Alam Sekitar**

| Objektif

Membangunkan sistem bagi pereko dan dan pengurusan maklumat program alam sekitar yang telah dilaksanakan oleh JAS. Setiap program akan dikira myJAS Index. Melalui sistem ini, hebahan aktiviti alam sekitar yang akan datang akan dimaklumkan kepada ahli Rakan Alam Sekitar bagi menggalakkan penyertaan program.

| Aktiviti

Bengkel URS

| Bahagian

Bahagian Komunikasi Strategik dan Bahagian Teknologi Maklumat.

EMAINS **Environmental Mainstreaming Tools System**

| Objektif

Membangunkan sistem pelaporan KPI GSR yang lebih praktikal melalui pengumpulan maklumat antara pegawai penguatkuasa JAS Negeri dan penyelaras KPI JAS yang lebih pantas serta penjana laporan dan analisa yang lebih cekap.

| Aktiviti

Bengkel URS dan UAT

| Bahagian

Bahagian Penguatkuasa, JAS Negeri dan Bahagian Teknologi Maklumat

MYRAS **Sistem Rakan Alam Sekitar**

| Objective

To develop a system to record and manage environmental program organized by DOE. The program will be assigned with respective myJAS Index also will allow the upcoming activities to be alerted to members of Rakan Alam Sekitar to attract participation.

| Activity

URS Workshop

| Division

Strategic Communication Division and Information Technology Division

EMAINS **Environmental Mainstreaming Tools System**

| Objective

To develop a practical KPI GSR reporting system via information gathering between State DOE officers and KPI Coordinators to help in generating more efficient reports and analysis.

| Activity

URS and UAT Workshop

| Division

Enforcement Division, State DOE and Information Technology Division.



Program Kesedaran dan Peningkatan Kemahiran ICT Warga JAS

Seminar *Environmental Monitoring & Management : Potential and Opportunities under IR 4.0*

Seminar diadakan untuk memberi pendedahan dan kefahaman kepada warga JAS berkenaan era IR4.0 dan semua pelaksanaan skop kerja JAS hendaklah menepati revolusi ini.

Kursus Rekaposter ePoster & Infografik

Kursus peringkat asas yang diadakan bagi memberi pendedahan kepada pegawai JAS untuk menghasilkan eposter dan infografik menggunakan MS Microsoft Powerpoint, MS Word dan aplikasi percuma yang lain.

Kursus Video Editing Menggunakan Filmora

Kursus diadakan untuk memberi pendedahan dan latihan suntingan video menggunakan aplikasi Filmora versi aplikasi mudah alih. Filmora merupakan aplikasisuntinganvideoyang mudah, dan ringkas yang membolehkan pengguna peringkat asas mampu membangunkan video yang komprehensif.



Program Kesedaran dan Peningkatan Kemahiran ICT Warga JAS

Seminar *Environmental Monitoring & Management : Potential and Opportunities under IR 4.0*

The seminar was held to provide information and understanding to JAS officers regarding the IR4.0 era and all implementation of the JAS job scopes should keep this revolution in place.

ePoster and Infographic Design Course

The basic level course was held in order to expose to DOE officers on how to design and produce eposter and infographic using MS Powerpoint, MS Word and other free applications.

Video Editing Using Filmora Course

The course was held to provide exposure and practice on video editing using Filmora mobile apps. The apps is easy and simple that allows basic level users able to build fast yet comprehensive videos.



Perolehan Perisian JAS : Microsoft Office 365

| Pengenalan

- Diperoleh melalui pelan langganan secara tahunan atau bulanan
- Membolehkan pengguna memiliki produk atau ciri-ciri terkini daripada MS Office
- Merangkumi MS Office keseluruhan (Aplikasi Office Desktop, Office Mobile, Office atas talian)

| Kelebihan

- Menguruskan fail dimana sahaja dengan simpanan awan sebanyak 1 TeraByte (1TB)
- Kemaskini dokumen tanpa isu kawalan versi
- Maximum 15 peranti untuk satu 1 lesen
- Fail yang disimpan boleh dikongsi bersama dengan pengguna lain menggunakan fungsi OneDrive

| Keselamatan

- Pengguna boleh menetapkan kebenaran untuk perkongsian fail
- Admin boleh menguruskan pengguna
- Admin boleh mengurus lesen pengguna
- Pemantauan proaktif daripada Microsoft bagi keselamatan data pengguna

Perolehan Perisian JAS : Microsoft Office 365

| Introduction

- Annual or monthly subscription plan
- Allows user to have latest MS Office features and products
- Full packages of MS Office (Office Desktop Application, Office Mobile, Office Online)

| Benefits

- Manage files from anywhere with 1TB of cloud storage
- Update documents without version control issues
- Maximum 15 devices for one license
- Files can be shared with others using OneDrive feature

| Security

- User able to set permission on files sharing
- Admin able to manage users
- Admin able to manage user licenses
- Proactive monitoring from Microsoft on data safety



MENGENAI TEKNOLOGI GEOSPATIAL DI JABATAN ALAM SEKITAR

Informasi Terkini

Bermula pada Julai 2017 sehingga akhir Disember 2018 lalu, Seksyen Geospatial, Bahagian Teknologi Maklumat giat melaksanakan kerja-kerja perolehan, penyeliaan dan latihan terhadap pemasangan infrastruktur baharu. Projek ini melibatkan penggantian server lama kepada server baharu *Hyper-Converged Infrastructure (HCI)*, konfigurasi arkitektur rangkaian geospatial, dan migrasi data-data, aplikasi geospatial sediaada dari server lama ke persekitaran baru.

ABOUT GEOSPATIAL TECHNOLOGY AT DEPARTMENT OF ENVIRONMENT

Latest Information

Starting from July 2017 until the end of December 2018, the Geospatial Section, Information Technology Division is actively, supervision, and training on new infrastructure installations. This project involves replacement of old servers to new servers *Hyper-Converged Infrastructure (HCI)*, the configuration of new geospatial network architecture, and migration of existing data, existing geospatial applications from legacy servers to new environments.



03-88712181/ 89/ 91/ 95/ 97/ 83



gisstaff@doe.gov.my



<https://geospas.doe.gov.my/portal>



**SEKSYEN GEOSPATIAL,
BAHAGIAN TEKNOLOGI
MAKLUMAT,
JABATAN ALAM SEKITAR,
Aras 3, Podium 3, Wisma
Sumber Asli,
No. 25, Persiaran Perdana,
Presint 462574 Putrajaya,
Malaysia**

Infrastruktur

Hyper-Converged Infrastructure (HCI)

Merupakan perisian yang berkeupayaan memvisualisasikan semua elemen sistem perkakasan konvensional. HCI ini meliputi *virtualized computing (hypervisor)*, *virtualised SAN (software-defined storage)* dan *virtualized networking (software-defined networking)*.

ArcGIS Enterprise

Membolehkan maklumat geospasial seperti *map services*, *features services*, dan *geoprocessing services* dapat dilihat oleh pengguna JAS melalui paparan layer di Portal GeoSpAS.

ArcGIS Portal 10.6

Platform yang membolehkan pegawai JAS berkongsi peta, aplikasi, dan maklumat geografi yang lain dengan pengguna lain dalam organisasi.

Aplikasi

Portal GeoSpAS (www.doe.gov.my/portal) telah ditambahbaik dengan penggantian platform lama (flex) ke platform Javascript yang mampu memaparkan maklumat geospasial lebih cepat serta penambahan widget yang lebih mesra pengguna.

Latihan

Latihan yang berjaya dijalankan dan dihadiri oleh pihak Seksyen Geospasial, Bahagian Teknologi Maklumat pada tahun 2018:

- Kursus Asas Geospasial:
4 kali (128 peserta)
- Latihan *Hands-on* Aplikasi GeoSpAS:
3 kali (64 peserta)

Infrastructure

Hyper-Converged Infrastructure (HCI)

Is a software capable of visualizing all elements of a conventional hardware system. This HCI includes virtualized computing (hypervisor), virtualized SAN (software-defined storage) and virtualized networking (software-defined networking).

ArcGIS Enterprise

Allows geospatial information such as map services, features services, and geoprocessing services to be seen by DOE users through layer layouts in GeoSpAS Portal.

ArcGIS Portal 10.6

Platform that allows DO Personnel to share maps, applications, and other geographical information with other users in the organization.

Application

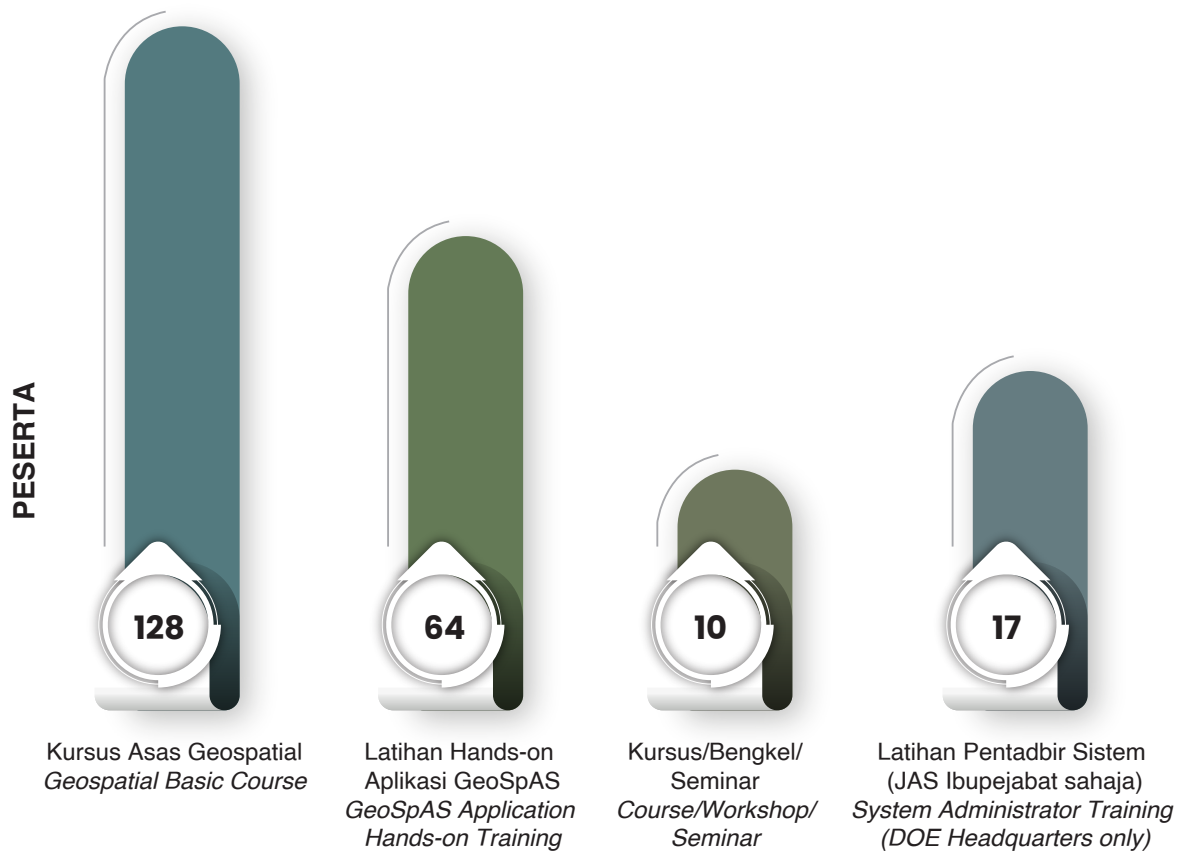
The GeoSpAS Portal (<https://doe.gov.my/portal>) has been improved with the replacement of the old platform (flex) to the Javascript platform which is able to display geospatial information faster and adds more user-friendly widgets.

Training

Number of successful courses conducted and attended by Geospatial Section, Information Technology Division in 2018:

- Geospatial Basic Course:
4 times (128 participants)
- GeoSpAS Application Hands-on Training:
3 times (64 participants)

- Kursus/Bengkel/Seminar:
1 kali (10 peserta)
- Latihan Pentadbir Sistem (JAS Ibupejabat sahaja):
3 kali (17 peserta)
- Course/Workshop/Seminar:
1 time (10 participants)
- System Administrator Training (DOE Headquarters only):
3 times (17 participants)



Carta jumlah peserta menghadiri latihan mengikut jenis latihan
Total attendance chart attends training by type of training



Data

Data Standard

Seksyen Geospasial, Bahagian Teknologi Maklumat telah mengambil inisiatif pada tahun 2018 ini dengan melaksanakan kerja-kerja pengemaskinian dan penyeragaman data-data geospasial yang terdapat di Jabatan. Hal ini bagi memastikan data-data geospasial di Jabatan ini adalah mengikut standard yang ditetapkan iaitu MS1759: 2004.

Apa Itu MS1759

MS1759:2004 (Maklumat Geografi/ Geomatik - Ciri-ciri dan Kod Atribut) yang menerangkan pengekodan dunia sebenar dari segi ciri-ciri dan sifat. Ciri-ciri adalah objek dunia sebenar manakala atribut adalah sifat atau ciri yang berkaitan dengan objek. Dokumen ini boleh dibeli dari SIRIM. (standard data geospasial) MS1759 (Sumber: Portal MyGDI)

Data

Standard Data

Geospasial Section, Information Technology Division took the initiative in 2018 by implementing the updating and standardization of geospasial data available in the Department. This is to ensure the geospasial data in this Department is in accordance with the established standard MS1759: 2004.

What Is MS1759

MS1759: 2004 (Geographical / Geomatics Information - Features and Attribute Code) which describes the real world encoding in terms of its characteristics and properties. Features are real-world objects while attributes are attributes or features related to objects. This document can be purchased from SIRIM. (standard geospasial data) MS1759 (Source: MyGDI Portal)



BAB 8

CHAPTER 8



INSTITUT ALAM SEKITAR MALAYSIA (EiMAS)

Sebagai sebuah Pusat kecemerlangan bagi Pengurusan Alam Sekitar di Malaysia, EiMAS bukan sahaja berperanan dalam meningkatkan kompetensi warga Jabatan Alam Sekitar malah bertanggungjawab dalam menyumbang kepada pembangunan tenaga kerja berasaskan pengetahuan dan kemahiran intensif dalam bidang alam sekitar termasuklah agensi-agensi kerajaan yang lain, organisasi, industri tempatan dan juga agensi-agensi alam sekitar antarabangsa.

Jumlah perjawatan EiMAS sehingga 31 Disember 2018 adalah 50 perjawatan dengan pengisian sebanyak 48 perjawatan.

EiMAS telah mempertingkatkan program latihan dalam bidang pengurusan alam sekitar dan kawalan pencemaran, serta perhatian telah diberikan kepada pembangunan modal insan yang dapat melindungi dan menguruskan alam sekitar secara holistik.

ENVIRONMENT INSTITUTE OF MALAYSIA (EiMAS)

The role of the Environment Institute of Malaysia (EiMAS) is no longer one of just upgrading the skills and knowledge of the staff in the Department of Environment, but more importantly, to contribute to the development of a knowledge driven and skill intensive workforce in the environmental field that include other government agencies, organizations, local industries and also international environmental agencies.

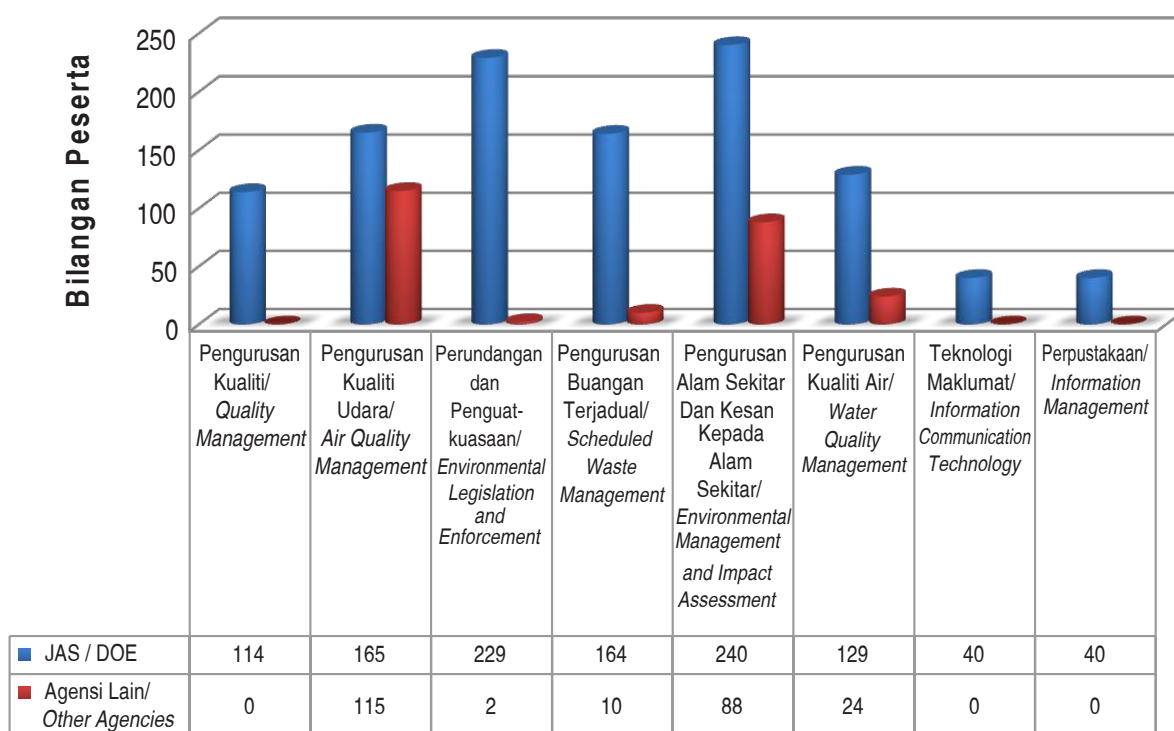
Total posts in EiMAS as of 31st December 2018 are 50 posts. Out of 50 posts, 48 posts have been filled.

EiMAS has intensified its training programs on environmental management and pollution control and more attention has been given to develop human capital capable of protecting and managing the environment in a holistic manner.





Rajah 8.1 : Program latihan Eimas 2018
Figure 8.1 : Eimas training programmes 2018



Peserta Mengikut Kategori Kursus Participants By Course Category

Rajah 8.2 : Bilangan peserta mengikut kategori kursus
Figure 8.2 : Number of participants by course category



Kursus Penguatkuasaan dan Penyiasaan Pembakaran Terbuka – Pn. Siti Zaleha Ibrahim, Pengarah JAS Selangor berkongsi pengalaman JAS Selangor dengan para peserta.
Course on Enforcement and Investigation of Open Burning – Pn. Siti Zaleha Ibrahim, S.M.S (Director of Selangor DOE) shared their experience with the participants.

Rajah 8.2 menunjukkan bilangan peserta mengikut kategori kursus. Daripada **1,360 peserta** yang menyertai program latihan yang dilaksanakan, **1,121 orang (82%)** adalah kakitangan Jabatan Alam Sekitar (JAS), manakala selebihnya adalah peserta dari agensi-agensi lain yang berkaitan.

Figure 8.2 shows the number of participants by course category. Out of the **1,360 participants**, **1,121 participants (82%)** were from Department of Environment (DOE) while the rest were participants from other related agencies.

Jadual 8.1 : Senarai Program Latihan EiMAS, 2018
Table 8.1 : EiMAS Training Programmes List, 2018

BIL	PENGURUSAN KUALITI UDARA AIR QUALITY MANAGEMENT	TARIKH DATE
1	Course on Certified Environmental Professional In Scrubber Inspection (CePSI) – 2 sesi	2-6 April 2018 2-6 Julai 2018
2	Course On Certified Environmental Professional In Bag Filter Inspection (CePBFI) – 2 sesi	22-26 Januari 2018 8-12 Oktober 2018
3	Course on Understanding The Procedure an Execution of CEMS in Industries	26-28 Februari 2018

BIL	PENGURUSAN KUALITI UDARA AIR QUALITY MANAGEMENT	TARIKH DATE
4	<i>Competency Course On Control Of Air Pollution From The Emission Of Motor Vehicle Type</i>	23-25 Julai 2018
5	<i>Course on Certified Environmental Professional on Air Pollution Control Engineering (Design Reviewer)</i>	16-20 Ogos 2018
6	<i>Course On Operation, Maintenance And Inspection Of Electrostatic Precipitator (ESP)</i>	18-21 September 2018
7	Kursus Persijilan Penguji Ujian Pelepasan Asap Kenderaan (Diesel & Petrol) – Fleet Operator (FO)/ Kemudahan Yang Dilesenkan (KYDL) – 5 sesi	5-7 Februari 2018 26-28 Mac 2018 2-4 Mei 2018 27-29 Ogos 2018 15-17 Oktober 2018

BIL.	PENGURUSAN KUALITI AIR WATER QUALITY MANAGEMENT	TARIKH DATE
1	<i>Certified Environmental Professional in Palm Oil Mill Effluent Treatment System Inspection (CePPOMETSI)</i>	5-9 Februari 2018
2	<i>Certified Environmental Professional in Industrial Effluent Treatment System Inspection (CePIETSI)</i>	5-9 Mac 2018
3	<i>Certified Environmental Professional in Industrial Effluent Treatment System Inspection (CePIETSI) – Lab Session</i>	12-14 Mac 2018
4	<i>Course On Practical Enforcement II – In Situ Measurement</i>	9-13 April 2018
5	<i>Course On Practical Enforcement II – Methods of Sampling and Preservation</i>	9-13 Julai 2018
6	<i>Course On Practical Enforcement II – Methods of Sampling and Preservation (Agensi Luar)</i>	6-10 Ogos 2018
7	<i>Certified Environmental Professional in Sewage Treatment Plant Inspection (CePSTPI)</i>	3-7 September 2018
8	<i>Certified IETS Notification Review</i>	1-5 Oktober 2018
9	Program Sangkutan (Attachment Program) Bagi Pembangunan Kepakaran Pegawai-Pegawai Jabatan Alam Sekitar Dalam Bidang Kejuruteraan Efluen Perindustrian	30 Julai – 1 Ogos 2018



BIL	PERUNDANGAN DAN PENGUATKUASAAN ENVIRONMENTAL LEGISLATION AND ENFORCEMENT	TARIKH DATE
1	<i>Course on Introduction and Application of Environmental Forensic</i>	22-26 Januari 2018
2	Kursus Pemahaman Penguatkuasaan kepada Pegawai Baru JAS	26 Februari – 2 Mac 2018
3	Kursus Penguatkuasaan & Kawalan Pencemaran Marin	19-23 Mac 2018
4	Kursus <i>Certified Environmental Professional in Green Industry</i> <i>Certified Environmental Professional in Cleaner Production Auditor</i>	16-25 April 2018
5	Kursus Pemantapan Pegawai Penyiasat dan Pegawai Pendakwa Jabatan	16-20 Julai 2018
6	Kursus Penguatkuasaan dan Penyiasatan Pembakaran Terbuka	24-28 September 2018
7	Kursus Pemantapan Penguatkuasaan GSR dan Pelaporan	27-30 Ogos 2018

BIL	PENGURUSAN BUANGAN TERJADUAL SCHEDULED WASTE MANAGEMENT	TARIKH DATE
1	Kursus Keselamatan & Kesihatan Pekerjaan Serta Pertolongan Cemas di Lapangan	5-9 Februari 2018
2	<i>Certified Environmental Professional in Scheduled Wastes Inspection</i> (CePSWi) Siri 1	5-9 Mac 2018
3	<i>Certified Environmental Professional in Scheduled Wastes Inspection</i> (CePSWi) Siri 2	23-27 April 2018
4	<i>Certified Environmental Professional in Scheduled Wastes Inspection</i> (CePSWi) Siri 3	9-13 Julai 2018
5	Kursus Kawalan Import dan Eksport Buangan Terjadual	3-7 September 2018
6	Kursus Pengurusan dan Kawalan Tanah Tercemar di Malaysia	24-28 September 2018
7	Bengkel dan Mesyuarat Bagi Penyediaan Modul Kursus Kompetensi Protokol Persampelan Buangan Terjadual Untuk Pegawai JAS	16-18 Oktober

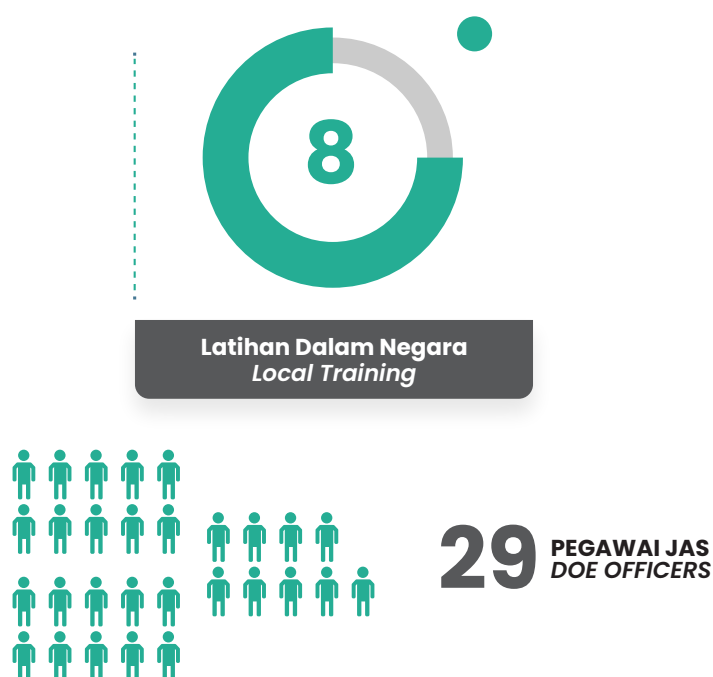
BIL	PENGURUSAN ALAM SEKITAR DAN KESAN KEPADA ALAM SEKITAR ENVIRONMENTAL MANAGEMENT AND IMPACT ASSESSMENT	TARIKH DATE
1	<i>Course On Air Quality Modelling For EIA Projects (Level 1)</i>	13-16 Mac 2018
2	<i>Course On Water Quality Modelling For EIA Projects</i>	3-6 April 2018
3	<i>Course On Hydraulic Modelling & Morphology For Coastal Development Projects (Level 1 & Level 2)</i>	16-20 April (Level I) 13-17 Ogos (Level II)
4	<i>Course on Geospatial (Middle Zone, North Zone, South Zone, Borneo Zone)</i>	19-23 Mac 2018 9-13 Julai 2018 13-17 Ogos 2018 24-28 September 2018
5	<i>Course on EIA Procedures and Review of EIA Reports</i>	13-17 Ogos 2018
6	<i>Course on Standard Operating Procedure (SOP) of EIA Enforcement</i>	18 Oktober 2018
7	<i>Workshop on Improvement and Coordination of EIA Modules</i>	9-13 Julai 2018

BIL	PENGURUSAN ALAM SEKITAR DAN KESAN KEPADA ALAM SEKITAR ENVIRONMENTAL MANAGEMENT AND IMPACT ASSESSMENT	TARIKH DATE
8	<i>Seminar on Showcase BMPs Polymer Block Technology for Badan Kawal Selia Air</i>	22-26 Oktober 2018
9	<i>Induction Course for Environmental Auditors</i>	19-23 Mac 2018

BIL	PENGURUSAN KUALITI QUALITY MANAGEMENT	TARIKH DATE
1	<i>Communication Skill</i>	20-23 Februari 2018
2	Kursus Penulisan Rasmi	27-30 Mac 2018
3	Protokol dan Etiket Sosial	2-4 Mei 2018
4	Kursus <i>Train The Trainer</i>	2-6 Julai 2018
5	<i>The Art Of Negotiation Skills</i>	3-5 Oktober 2018

BIL	TEKNOLOGI KOMUNIKASI MAKLUMAT INFORMATION COMMUNICATION TECHNOLOGY	TARIKH DATE
1	Kursus Sistem Penguatkuasaan Bergerak (MFORCE)	11-12 April 2018
2	Kursus Reka e-Poster dan Infografik	29-30 Ogos 2018

BIL	PENGURUSAN MAKLUMAT PERPUSTAKAAN LIBRARY INFORMATION MANAGEMENT	TARIKH DATE
1	Bengkel Penerbitan Jabatan Siri I	23-24 April 2018
2	Bengkel Penerbitan Jabatan Siri II	25-28 September 2018



Rajah 8.3 : Program latihan dalam negara, 2018
Figure 8.3 : Local training courses, 2018

Program Latihan di Dalam Negara

EiMAS turut menguruskan pencalonan pegawai-pegawai JAS untuk berkursus di dalam dan luar negara serta mengikuti program sangkutan/latihan di beberapa industri dan agensi.

Pada tahun 2018, seramai **29 pegawai JAS** telah menghadiri sejumlah **8 kursus dalam negara** yang dianjurkan oleh EiMAS, sepertimana dalam **Jadual 8.2**.

Local Training Programmes

Apart from internal training, EiMAS also sent DOE officers for training and attachment programs at selected industries and agencies.

A total of **29 DOE officers** attended **8 local courses** in 2018 as shown in **Table 8.2**.

Jadual 8.2 : Senarai Latihan di Dalam Negara, 2018
Table 8.2 : Local Training Courses, 2018

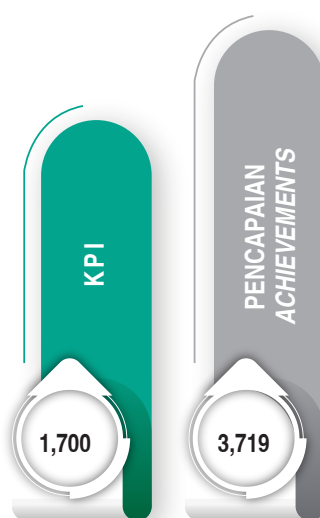
BIL NO	TAJUK TITLE	PENGANJUR ORGANIZER	TEMPAT PLACE	TARIKH DATE	BILANGAN PESERTA NO. OF PARTICIPANTS
1	Tranformasi Pembangunan Sosio Ekonomi Mampan Dan Inklusif Menuju 2050	INTAN Bukit Kiara	Auditorium INTAN Bukit Kiara	12 Februari 2018	2
2	Seminar MS 2678:2017 <i>Flammable Refrigerant System-Code of Practice</i>	SIRIM STS	Horizon Hotel, Kota Kinabalu	3 April 2018	2
3	<i>National Seminar on Sustainable Development - The Future We Want (NSoSD)</i>	Pertubuhan Profesional JKR Malaysia	Dewan Tan Sri Mahfuz Khalid, Kuala Lumpur	24 - 25 April 2018	1
4	<i>National Seminar on Coastal Morphology(COSMO) 2018</i>	NAHRIM	Mini Auditorium, NAHRIM	24 April 2018	2
5	Program Pembangunan Kepakaran Pegawai JAS Dalam Bidang Kejuruteraan Pengolahan Efluen Perindustrian	EiMAS	Kilang F&N Beverages Manufacturing Sdn Bhd Kuching, Sarawak	30 Julai – 1 Ogos 2018	6
6	<i>World Library and Information Congress 84th IFLA General Conference and Assembly (IFLA WLIC)</i>	Kem. Pelancongan dan Kebudayaan Malaysia dan Perpustakaan Negara Malaysia	KLCC	24-30 Ogos 2018	2
7	<i>4th NEHAP Conference 2018</i>	Kem. Kesihatan Malaysia	Hotel Bangi-Putrajaya	25-Sep-18	3
8	Program Pembangunan Kepakaran Pegawai JAS Dalam Bidang PEMS	EiMAS	Petronas Methanol, Labuan	7 – 9 November 2018	11

Bagi tahun 2018, KPI yang telah ditetapkan untuk bilangan pegawai industri yang dilatih adalah seramai 1,700 orang. Sepanjang tahun 2018, EiMAS telah berjaya melatih seramai 3,719 orang pegawai industri (**Rajah 8.4**).

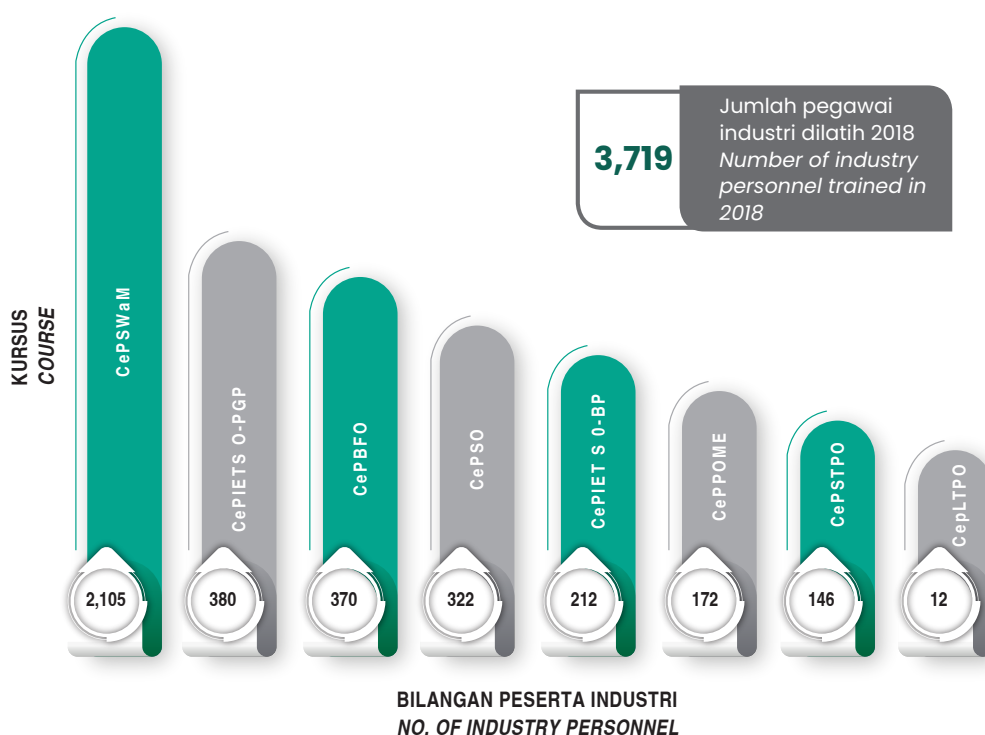
Bilangan kehadiran pegawai industri mengikut jenis kursus menunjukkan kursus *Certified Environmental Professional in Scheduled Waste Management (CePSWaM)* mencatat bilangan peserta yang tertinggi, seperti yang ditunjukkan dalam **Rajah 8.5**.

For 2018, the Key Performance Indicator (KPI) set for the number of trained industry personnel is 1,700. Throughout 2018, EiMAS has successfully trained 3,719 industry personnel (**Figure 4**).

Attendance of Industrial personnel according to type of courses indicate that course for Certified Environmental Professional in Scheduled Waste Management (CePSWaM) recorded the highest number of participants, as shown in **Figure 8.5**.



Rajah 8.4 : Bilangan pegawai industri dilatih berbanding KPI yang ditetapkan bagi tahun 2018
Figure 8.4 : Number of industry personnel trained against KPI set for the year 2018



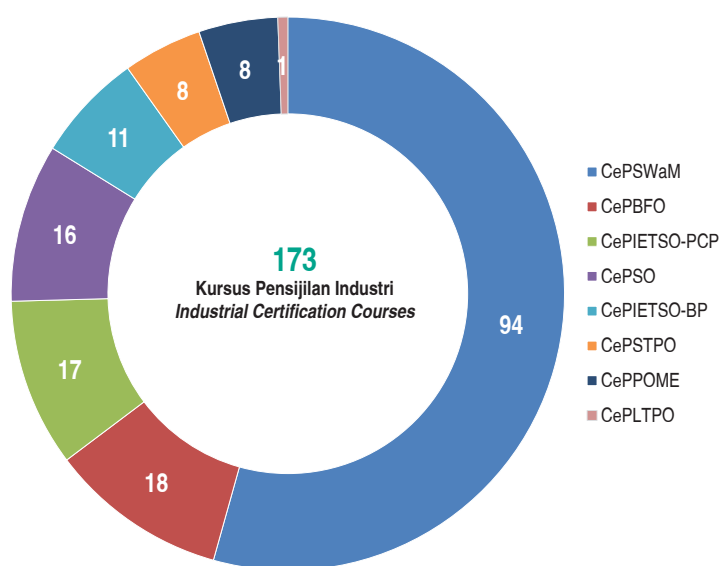
Rajah 8.5 : Statistik bilangan pegawai industri dilatih mengikut kursus, 2018
Figure 8.5 : Number of industry personnel trained according to course, 2018

Sepanjang tahun 2018, sebanyak 8 jenis kursus pensijilan industri telah dilaksanakan dengan jumlah **173 siri kursus**, seperti yang ditunjukkan dalam **Rajah 8.6**.

During 2018, a total of 8 types of industrial certification courses were conducted with a total of **173 series of courses**, as shown in **Figure 8.6**.

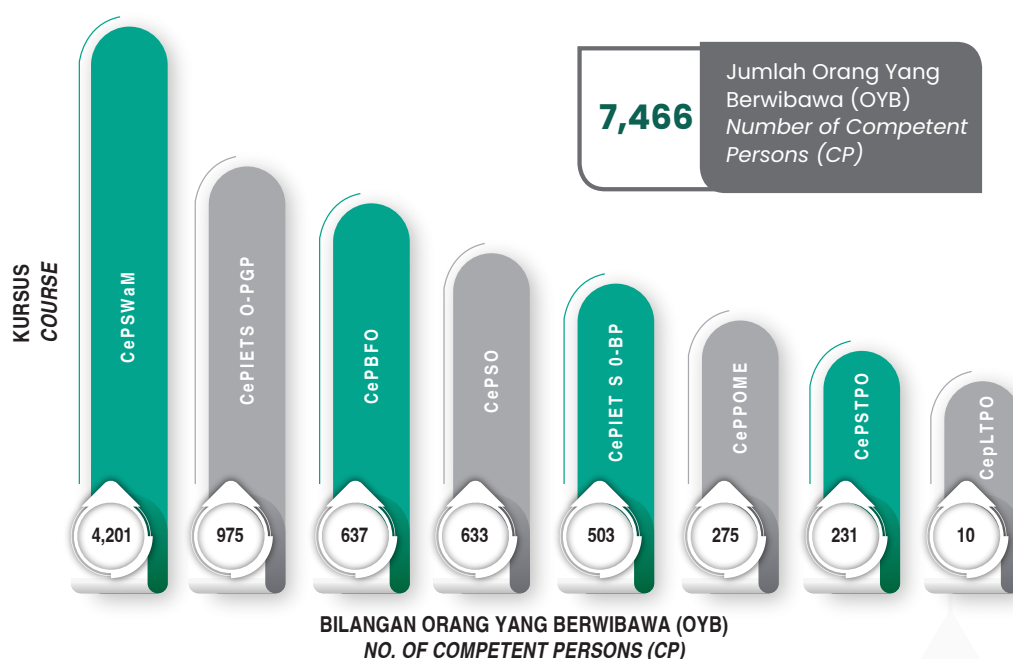
Rajah 8.7 menunjukkan sehingga 31 Disember 2018, EiMAS telah berjaya mengiktiraf seramai 7,466 orang pegawai industri sebagai Orang Yang Berwibawa selaras dengan kehendak Seksyen 49A, Akta Kualiti Alam Sekeliling 1974.

Figure 8.7 shows that until 31st December 2018, EiMAS has successfully certified a total of 7,466 industry personnel as a Competent Person in accordance with the requirements of Section 49A of the Environmental Quality Act, 1974.



Rajah 8.6 : Bilangan kursus pensijilan industri yang dianjurkan, 2018

Figure 8.6 : Number of industry certification courses conducted, 2018

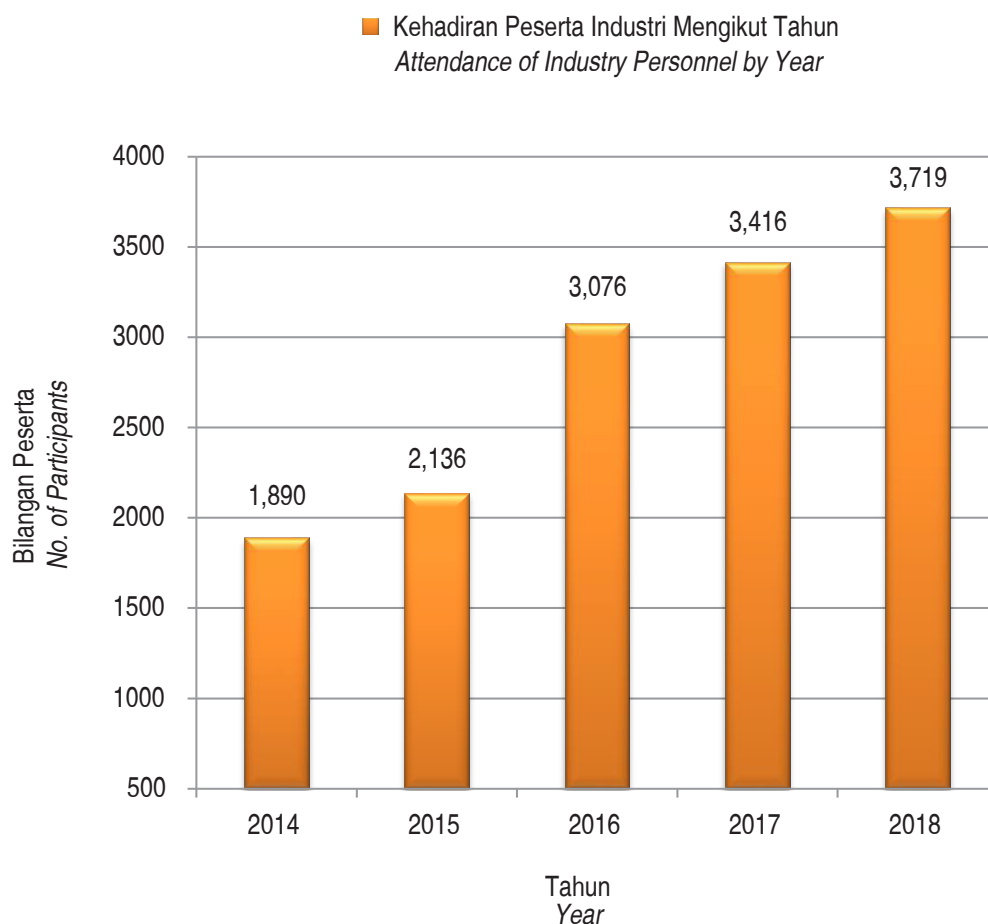


Rajah 8.7 : Statistik bilangan orang yang berwibawa mengikut jenis pensijilan secara keseluruhan sehingga 31 Disember 2018

Figure 8.7 : Statistics of competent persons according to type of certification till 31st December 2018

Bilangan kehadiran pegawai industri bagi kursus pensijilan untuk 5 tahun terkini menunjukkan tren yang bagus iaitu mempunyai peningkatan yang signifikan untuk setiap tahun, sepertimana ditunjukkan di dalam **Rajah 8.8**.

The attendance of industry personnel for industry certification courses in the last 5 years shows a remarkable trend with a significant increase each year, as shown in **Figure 8.8**.



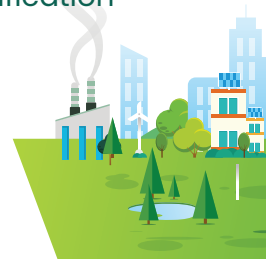
Rajah 8.8 : Bilangan kehadiran pegawai industri bagi 5 tahun terkini (2014 – 2018)
Figure 8.8 : Attendance of industry personnel for the last 5 years (2014 – 2018)

MAJLIS PENTAULIAHAN ORANG YANG BERWIBAWA

Majlis Pentaualiahan Orang Yang Berwibawa telah diadakan pada 25hb. Julai 2018 bertempat di Hotel Bangi-Putrajaya, Bangi. Majlis ini diadakan bertujuan untuk memberi pengiktirafan

CONVOCATION CEREMONY FOR COMPETENT PERSONS

Convocation Ceremony for Competent Persons was held on 25th July 2018 at Bangi-Putrajaya Hotel, Bangi. The event was held to give recognition to industry personnel who completed the certification



kepada pegawai industri yang telah melengkapkan proses pensijilan dan seterusnya ditauliah sebagai Orang Yang Berwibawa sepertimana yang diperuntukkan di dalam Seksyen 49A, Akta Kualiti Alam Sekeliling 1974. Seramai 85 orang pegawai industri telah menerima sijil OYB pada majlis tersebut.

process and subsequently be certified as Competent Person as provided in Section 49A of the Environmental Quality Act 1974. A total of 85 industry personnel have received the competent person certificates at the event.



Y.Bhg. Dato' Ketua Pengarah Alam Sekitar bergambar bersama Orang-Orang Yang Berwibawa, 25 Julai 2018

Photography Session of YBhg. Dato' Director General of Environment with the Competent Persons, 25 July 2018



Y.Bhg. Dato' Ketua Pengarah Alam Sekitar menyampaikan amanat kepada Orang Yang Berwibawa, 25 Julai 2018
YBhg. Dato' Director General of Environment convey his message to the Competent Person, 25 July 2018

MALAYSIAN TECHNICAL COOPERATION PROGRAMME (MTCP) COURSE ON ENVIRONMENTAL MANAGEMENT AND POLLUTION CONTROL

Program Kerjasama Teknikal Malaysia (MTCP), dengan Kementerian Luar Negeri sebagai "*focal point*"nya, telah dianjurkan pada 1 hingga 14 Ogos 2018, untuk pegawai-pegawai dari luar negara yang bertugas di agensi atau Kementerian yang berkaitan pengurusan alam sekitar dan kawalan pencemaran di negara masing-masing.

Peserta-peserta kursus terdiri daripada pegawai-pegawai dari negara Nigeria, Ghana, Zimbabwe, Morocco, Krgyzstan, Saudi Arabia, Maldives, Lao PDR, Cambodia, Thailand, Brunei, Timor Leste serta 2 orang peserta Malaysia dari Jabatan Perlindungan Alam Sekitar Negeri Sabah dan *Natural Resources and Environment Board Sarawak*.

Sepanjang kursus dua (2) minggu ini, peserta-peserta telah didedahkan mengenai:

- Dua (2) model pendekatan penguatkuasaan iaitu *Command and Control (C & C)* dan Pematuhan Kendiri Terpimpin (*Guided Self Regulation*);
- Dua (2) model pendekatan pengawasan iaitu pengawasan secara automatik (*automatic Monitoring*) dan sistem atas talian (*on-line system*);
- Kawalan pencemaran air sisa/effluen dan pelepasan ke udara;
- Pendekatan perancangan bagi kawalan pencemaran dan impak, serta pencegahan;

MALAYSIAN TECHNICAL COOPERATION PROGRAMME (MTCP) COURSE ON ENVIRONMENTAL MANAGEMENT AND POLLUTION CONTROL

Malaysian Technical Cooperation Program (MTCP), with the Ministry of Foreign Affairs as its focal point was organized on 1 to 14 August 2018, for personnel who is working in agencies or ministries related to environmental management and pollution control in their respective countries.

The course participants are from Nigeria, Ghana, Zimbabwe, Morocco, Krgyzstan, Saudi Arabia, Maldives, Lao PDR, Cambodia, Thailand, Brunei, Timor Leste and 2 Malaysian participants from the Department of Sabah Environment Protection and Natural Resources and Environment Board Sarawak.

During two (2) weeks course, participants will be exposed to:

- Two (2) enforcement approach models - *Command and Control (C & C)* and *Guided Self Regulation (Guided Self Regulation)*;
- Two (2) surveillance approach models - *Automatic Monitoring and on-line system*;
- Contamination of wastewater/ effluent and emissions into the air;
- Planning approach for pollution control and impact, and prevention;



- Isu-isu kawalan pencemaran spesifik bagi pengurusan buangan terjadual, dan kawalan hakisan dan kelodakan; dan
- Keperluan kompetensi dalam pengendalian alat kawalan pencemaran air dan udara serta pengurusan buangan terjadual.

- Control issues specific to wastes management, control of erosion and siltation; and
- Competency requirements in the handling of water and air pollution control equipment as well as scheduled waste management.

LAND DISTURBING POLLUTION PREVENTION AND MITIGATION MEASURES (LDP2M2) DESIGNER TRAINING PROGRAM MODULE

Hakisan tanah dan sedimentasi telah menjadi salah satu isu utama dalam pelaksanaan projek EIA di Malaysia. Pembukaan tanah secara tidak terkawal dalam melaksanakan projek EIA boleh menyumbang kepada berlakunya masalah hakisan tanah dan sedimentasi. Oleh yang demikian Jabatan Alam Sekitar telah merangka satu strategi baru untuk menangani masalah ini dengan memperkenalkan *Land Disturbing Pollution Prevention and Mitigation Measure (LDP2M2)* yang bertujuan untuk mengurangkan masalah hakisan tanah dan sedimentasi yang berlaku daripada projek EIA.

LDP2M2 merujuk kepada penggunaan kaedah pembinaan, proses, bahan dan amalan yang bertujuan untuk mencegah, mengurang, meminima atau menghapus pelepasan sedimen dari kawasan pembangunan yang mengandungi bahan pencemar utama (pepejal terampai) yang disebabkan oleh aktiviti gangguan tanah.

Kompetensi dalam bidang alam sekitar amat penting bagi memastikan mereka yang berkelayakan sahaja

LAND DISTURBING POLLUTION PREVENTION AND MITIGATION MEASURES (LDP2M2) DESIGNER TRAINING PROGRAM MODULE

Soil erosion and sedimentation has become one of the major issues in the implementation of EIA projects in Malaysia. Uncontrolled land opening activities exacerbate these soil erosion and sedimentation problems. In this regard the Department of Environment (DOE) Malaysia has designed a new strategy to address this problem by introducing Land Disturbing Pollution Prevention and Mitigation Measure (LDP2M2) with the aim of minimizing the problems of soil erosion and sedimentation from EIA projects.

LDP2M2 is refer to the use of construction methods, processes, materials and practices that is intended to prevent, reduce, minimize or eliminate discharge of sediment from the development area containing the major pollutant (suspended solids) resulting from land disturbing activities.

Competence in the field of environment is crucial to ensure only qualified person are given the role of managing the

diberikan peranan untuk menguruskan aspek-aspek pengurusan alam sekitar dengan berkesan. Oleh yang demikian, Institut Alam Sekitar Malaysia (EiMAS), Jabatan Alam Sekitar di bawah projek pembangunan RMK-11, telah membangunkan Modul Latihan *Land Disturbing Pollution Prevention And Mitigation Measures (LDP2M2) Designer Training Program*. Objektif program latihan ini adalah untuk membimbing dan memberikan maklumat dari segi kriteria reka bentuk amalan berkesan *Best Management Practices (BMPs)* dalam kawalan hakisan dan kelodakan. Modul ini akan menjadi rujukan kepada pegawai Jabatan Alam Sekitar (JAS), Perunding EIA dan Pengamal Alam Sekitar. *LDP2M2 Designer Training Program* adalah modul latihan yang komprehensif dan khusus untuk pereka dan penilai.

aspects of environmental management effectively. Therefore, the Environment Institute of Malaysia (EiMAS), Department of Environment (DOE), under the Eleventh Malaysia Plan Development Project, has developed the *Land Disturbing Pollution Prevention and Mitigation Measures (LDP2M2) Designer Training Program* Module. The objective of this training program is to guide and provide information in terms of design criteria of *Best Management Practices (BMPs)* for erosion and sediment control. This module will be a reference to the Department of Environment (DOE) officers, EIA Consultants and Environmental Practitioners. The *LDP2M2 Designer Training Program* is a comprehensive competent training module and specifically for designer and reviewer.



Silt Fence
Silt Fence



Active Treatment System (ATS)

- Pump, Chemical Dosing/ PAM Polymer, Flocculation & Geotube
- Active Treatment System (ATS)
- Pump, Chemical Dosing/ PAM Polymer, Flocculation & Geotube



Perpustakaan EiMAS

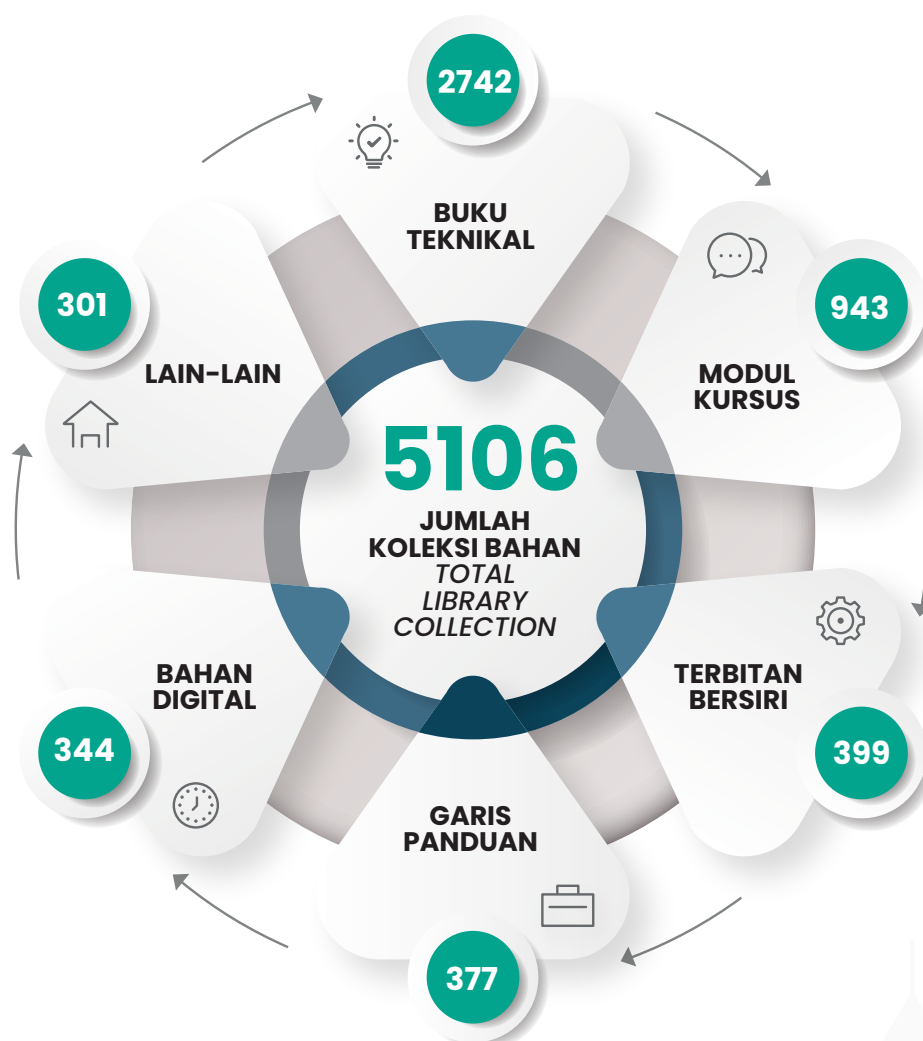
Sepanjang tahun 2018, Perpustakaan EiMAS telah meneruskan usaha bagi memantapkan kualiti perkhidmatan yang disediakan bagi menyokong keperluan rujukan dan maklumat warga JAS serta peserta-peserta kursus anjuran EiMAS.

Jumlah Koleksi bahan di Perpustakaan EiMAS ialah sebanyak **5106 judul bahan** yang merangkumi buku-buku teknikal, modul kursus, terbitan bersiri/jurnal, garis panduan dan lain-lain bahan berkaitan alam sekitar terbitan dalam dan luar negara.

EiMAS Library

Throughout the year 2018, EiMAS Library has continued its efforts to strengthen the quality of services provided to support needs of knowledge and information to the DOE and course participants organized by EiMAS.

Currently EiMAS Library have **5106 titles** or entries covering technical books, course modules, serials/ journals, guidelines and other collection.



Rajah 8.9 : Pecahan koleksi bahan Perpustakaan EiMAS
Figure 8.9 : EiMAS Library collection breakdown



Aktiviti dan program Perpustakaan EIMAS sepanjang tahun 2018
EiMAS Library activities and programmes for the year 2018

Jadual 8.3 : Aktiviti dan Program Perpustakaan EIMAS Sepanjang Tahun 2018
Table 8.3 : EiMAS Library activities and programmes for the year 2018

BIL NO	AKTIVITI/PROGRAM ACTIVITIES/PROGRAMME	TARIKH DATE
1	Pameran Buku-Buku Teknikal oleh Penerbit Buku Technical Books Exhibition by Publisher	6 Mac 2018
2	Sesi Technology Updates : OECD Environment iLibrary Technology Updates Session : OECD Environment iLibrary	16 April 2018
3	Bengkel Penerbitan Jabatan Siri I Publication Course Series I	23 – 24 April 2018
4	Bengkel Penerbitan Jabatan Siri II Publication Course Series II	25 – 28 September 2018
5	Anugerah Icon Membaca EiMAS EiMAS Reading Icon Award	Disember 2018
6	Program Jom Baca Bersama untuk 10 Minit Read Together for 10 Minits	Sepanjang Tahun 2018
7	Penyelaras Penerbitan Buletin/Majalah EiMAS EiMAS Bulletin coordinator	Dwi Tahunan 2018
8	Menerbitkan info@Perpustakaan Published info@Perpustakaan EiMAS	4 kali setahun 2018
9	Lawatan Informasi ke Nasrur Quran, Putrajaya Info-Trip to Nasrur Quran, Putrajaya	28 November 2018





Kursus Certified Environmental Professional in Cleaner Production Auditor – Peserta bergambar bersama Pengarah kilang selepas program lawatan di Yong Fong Rubber Industry Sdn. Bhd.

Course on Certified Environmental Professional in Cleaner Production Auditor – Participants with the Director of Yong Fong Rubber Industry Sdn. Bhd.



Course on Certified Environmental Professional in Scrubber Inspection (CEPSI) – Series 1/2018 pada 2 hingga 6 April 2018 di Pusat Latihan Amali SKPU, EiMAS, Bandar Baru Bangi.

Course on Certified Environmental Professional in Scrubber Inspection (CEPSI) – Series 1/2018 on 2 – 6 April 2018 at Pusat Latihan Amali SKPU, EiMAS, Bandar Baru Bangi.



Course on Certified Environmental Professional in Bag Filter Inspection (CEPBFI) – Series 1/2018 pada 22-26 Januari 2018 di Pusat Latihan Amali SKPU, EiMAS, Bandar Baru Bangi.

Course on Certified Environmental Professional in Bag Filter Inspection (CEPBFI) – Series 1/2018 on 22-26 January 2018 at Pusat Latihan Amali SKPU, EiMAS, Bandar Baru Bangi.



Kursus *Certified Environmental Professional in Scheduled Wastes Inspection (CePSWI)*, Siri 3 pada 9-13 Julai 2018: Peserta Kursus Berbincang Mengenai Kajian Kes.

Certified Environmental Professional in Scheduled Wastes Inspection (CePSWI) on 9-13 July 2018: Discussion on Case Study.



Peserta Kursus *Practical Enforcement II – Method of Sampling and Preservation*; 9-13 Julai 2018.

Participants of Course on *Practical Enforcement II – Method of Sampling and Preservation*; 9-13 July 2018.



Peserta Kursus *Certified Environmental Professional In Industrial Effluent Treatment System Inspection (CePIETSI)*; 5-14 Mac 2018

Participants of Course On *Certified Environmental Professional In Industrial Effluent Treatment System Inspection (CePIETSI)*; 5-14 March 2018





Kursus Induksi
Juruaudit Alam
Sekitar.
Induction Course
for Environmental
Auditors.



Lawatan Pembelajaran
dan Majlis Penutup
Peserta MTCP 2018.
Learning Visit and
Closing Ceremony
MTCP Participants 2018.



BAB 9

CHAPTER 9



MENGARUSPERDANA AMALAN INDUSTRI HIJAU DALAM KALANGAN PERUSAHAAN KECIL DAN SEDERHANA (PKS) KE ARAH PERTUMBUHAN HIJAU

Memperkasakan Amalan Industri Hijau Dalam Kalangan Perusahaan Kecil Dan Sederhana (PKS) Ke Arah Pertumbuhan Hijau

Di bawah Rancangan Malaysia Kesebelas (RMKe11) Unit Industri Hijau (UIH) telah merancang pelbagai program dan projek sebagai menyokong hasrat dan wawasan Negara Malaysia mencapai status Negara Maju menjelang tahun 2020.

Dengan tema Mengarusperdana Amalan Industri Hijau Dalam Kalangan Perusahaan Kecil dan Sederhana (PKS) Ke Arah Pertumbuhan Hijau, UIH telah menetapkan matlamat RMKe11 iaitu untuk memperkukuhkan amalan Industri Hijau dalam kalangan Perusahaan Kecil dan Sederhana (PKS) ke arah Pengeluaran Lestari dan untuk mengurangkan pelepasan gas rumah hijau (GHG).

Diantara objektif program adalah untuk :

1. Menyokong inisiatif pengurangan jejak karbon (carbon footprint), selaras dengan hasrat negara untuk mengurangkan intensiti pelepasan gas rumah kaca (Greenhouse gas - GHG) daripada Keluaran Dalam Negara Kasar sebanyak 45% menjelang 2030 berbanding intensiti pelepasan GHG pada tahun 2005;
2. Menyokong usaha penghijauan industri (*greening of industry*);

MAINSTREAMING GREEN INDUSTRY PRACTICES AMONG SMALL AND MEDIUM ENTERPRISES (SME) TOWARDS GREEN GROWTH

Mainstreaming Green Industry Practices Among Small And Medium Enterprises (SME) Towards Green Growth

Under the Eleventh Malaysia Plan (RMKe11) Green Industry Unit (UIH) DOE has planned programmes and projects to support the national vision to become developed country in 2020.

With the theme of Mainstreaming Green Industry Practices Among Small And Medium Enterprises (SME) Towards Green Growth, UIH is committed to deliver its RMKe11 programme aims to strengthen Green Industry practices among Small and Medium Industries towards sustainable production and to reducing Green House Gases (GHG) emission.

The objectives of the program were:

1. To support Carbon Foot Print reduction initiative inlined with national target to reduce 45 % of Green House Gases intensity in year 2030 based on Gross Domestic Products (GDP) year 2005;
2. To support the greening of industry initiative;

3. Menerapkan budaya pematuhan sendiri terkawal dan mewujudkan PKS yang berdaya saing dan mesra alam;
4. Meningkatkan pematuhan PKS terhadap keperluan perundangan alam sekitar; dan
5. Meningkatkan penggunaan sumber secara lestari selaras dengan 2030 Agenda for Sustainable Development Goals (SDG).

Berikut projek dan aktiviti yang telah dilaksanakan pada tahun 2018:

i) Program Penyelidikan dan Pembangunan Premis Demonstrasi Amalan Industri Hijau

Program Penyelidikan dan Pembangunan (R&D) Premis Demonstrasi Amalan Industri Hijau

Objektif utama program adalah untuk membangunkan premis demonstrasi Amalan Industri Hijau yang akan menjadi contoh dan galakkan kepada industri untuk melaksanakan amalan Industri Hijau di dalam operasi premis masing-masing.

Pada tahun 2018 program Penyelidikan dan Pembangunan (R&D) Premis Demonstrasi Amalan Industri Hijau telah mula dilaksanakan di bawah program Latihan Pengeluaran Bersih (CP) Untuk Pembangunan Premis Demonstrasi Amalan Industri Hijau Bagi Kilang Minyak Kelapa Sawit Mentah. Program ini akan dilaksanakan dalam dua (2) fasa bagi tempoh dua (2) tahun iaitu 2018–2019.

Komponen keseluruhan projek ini adalah melibatkan perkara seperti berikut:

1. Melaksanakan Latihan CP termasuk latihan amali kepada pihak kilang dimana premis demonstrasi dibangunkan.

3. To inculcate Guided Self Regulation (GSR) and create competitive and environmental friendly SME;
4. To increased SME environmental compliance; and
5. To Increased sustainable resources consumption inlined with 2030 Agenda for Sustainable Development Goals (SDG).

Those are the projects and activities undertaken in 2018:

i) Research and Development of Green Industry Premises

Research and Development (R&D) of Green Industry Demonstration Premises

The main objective of the program is to developed Green Industry Practices Premises as a show case and encouragement for other industry especially SMEs to implement Green Industry Practices in their operation.

In 2018, Research and Development (R&D) Program of Green Industry started under program “*Latihan Pengeluaran Bersih (CP) Untuk Pembangunan Premis Demonstrasi Amalan Industri Hijau Bagi Kilang Minyak Kelapa Sawit Mentah*”. This program will be completed in two (2) phases for the period of two (2) years.

The overall project components include activities as listed below:

1. To organize and conduct CP training for workers at selected demonstration premises.



2. Mengenal pasti unit operasi di dalam kilang minyak kelapa sawit mentah yang berpotensi bagi pelaksanaan amalan Industri Hijau.
3. Melaksanakan opsyen CP yang terpilih dan bersesuaian dengan memberi penekanan kepada langkah pencegahan dan kawalan pencemaran.
4. Membangunkan dan mencetak buku Garis Panduan Pelaksanaan Amalan Industri Hijau Bagi Kilang Minyak Kelapa Sawit Mentah.
5. Menyediakan tenaga pengajar/penceramah bagi mengendalikan seminar mempromosikan pelaksanaan amalan Industri Hijau.

Di antara aktiviti program di bawah fasa satu tahun 2018 adalah seperti berikut:

1. Mengadakan latihan dan amali amalan Industri Hijau kepada pekerja premis demonstrasi kilang minyak kelapa sawit mentah.
2. Membangunkan premis demonstrasi amalan Industri Hijau bagi kilang minyak kelapa sawit mentah melalui konsep Pengeluaran Bersih (CP)

Semua aktiviti telah dilaksanakan mengikut jadual dan mencapai objektif yang telah disasarkan.

2. Identify potential process unit operations in crude palm oil mill that is suitable for green industry implementation.
3. Implementation of CP options that focus in pollution prevention and control.
4. Developed and printing of the guidelines for Green Industry implementation in Crude Palm Oils Mill.
5. Provide trainer/speakers to organize and conduct Green Industry promotional seminar.

The activities under phase one (Year 2018) program includes:

1. Providing Green Industry practices hands on training for Crude Palm Oil Mill demonstration premises staff.
2. Developed Green Industry Demonstration project for Crude Palm Oil Mill through Cleaner Production concept.

All the above activities were successfully implemented and the projected objective is achieved.



Majlis Penyerahan Loji Biodigester, Projek Demonstrasi Amalan Industri Hijau kepada PPNJ Poultry & Meat Sdn. Bhd.

Handover Ceremony of Biodigester Plant, Green Industry Practices Demonstration Project to PPNJ Poultry & Meat Sdn. Bhd.

ii) Program Bantuan Khidmat Nasihat Pengeluaran Bersih (CP) Kepada Perusahaan Kecil dan Sederhana (PKS)

Program Khidmat Nasihat Industri Hijau kepada Perusahaan Kecil dan Sederhana (PKS) dan industri lain

Projek Audit Pengeluaran Bersih atau "*Cleaner Production*" (CP) kepada Perusahaan Kecil dan Sederhana (PKS) dilaksanakan bertujuan untuk meningkatkan kesedaran dan kefahaman pengusaha PKS mengenai konsep Pengeluaran Bersih.

Bagi tahun 2018 program ini telah dilaksanakan oleh pihak perunding yang dilantik iaitu Galaxy Tech Solutions. **Jadual 9.1** menunjukkan lima (5) buah premis PKS telah dipilih di sekitar Negeri Sembilan, Melaka dan Pulau Pinang telah menyertai program ini.

Melalui program ini, latihan dan pendedahan berkaitan konsep Pengeluaran Bersih diberikan kepada pekerja premis PKS yang dipilih dan seterusnya akan melaksanakan aktiviti audit pengeluaran bersih secara terperinci. Laporan Terperinci Audit Pengeluaran Bersih akan memberi maklumat profil operasi PKS dan cadangan-cadangan opsyen Pengeluaran Bersih yang boleh dilaksanakan oleh pihak PKS dan juga maklumat tentang jumlah jejak karbon yang telah dihasilkan daripada keseluruhan operasi pengeluaran PKS. Pihak PKS seterusnya dapat menilai cadangan opsyen CP yang boleh dilaksanakan kearah pengurangan jejak karbon bagi premis PKS tersebut.

ii) Cleaner Production Audit Assistance For Small and Medium Industry (SME)

Green Industry Advisory Services for Small and Medium Industry (SMEs) and other industries

The Cleaner Production Audit Assistance project for Small and Medium Enterprises (SMEs) was introduced to enhance the awareness and understanding of the Cleaner Production concept among SMEs.

In 2018 the Cleaner Production Training for SMEs towards Development of Green Industry Demonstration Site program was carried out in collaboration with Galaxy Tech Solutions. As shown in **Table 9.1**, five (5) SME premises in Negeri Sembilan, Melaka and Pulau Pinang were selected to participate in the program.

In this program, CP concept was exposed to the SME staff before they carry out CP audit. From the findings of CP audit, they will produce a detail CP audit report which contains information profile of SME and proposed CP options that can be implemented by SME. The document will also report on the total carbon footprint of the SME. Therefore, an SME can identify which CP options that can be implemented to reduce certain amount of carbon footprint in their operations.



Pihak PKS juga didedahkan dengan pengalaman dan pengetahuan tentang Pengeluaran Bersih disamping pihak PKS lain juga dapat merujuk kepada garis panduan amalan Industri Hijau yang telah dibangunkan hasil daripada program ini dan program ini dapat berkembang dengan sendirinya.

SMEs will gain experience and knowledge of Cleaner Production and other similar SME can also use the Green Industry practice guidelines that have been developed under the program if they are interested to carry out the CP program by themselves. This will help to increase the implementation of the CP program by SMEs.

Jadual 9.1 : Senarai Premis bagi Program Latihan Pengeluaran Bersih (CP) kepada PKS
Table 9.1 : List of Premises in CP Training Program for SME

BIL NO	PREMIS PREMISES	TARIKH DATE	BILANGAN OPSYEN CP DIJANA NO OF CP OPTION
1	Malaysian Youghurt Sdn. Bhd, Negeri Sembilan	15 Mei 2018 15 May 2018	15
2	Sin Sing Coffee Sdn. Bhd, Melaka	18 Julai 2018 18 July 2018	14
3	Teck Leong Coffee & Tea Sdn. Bhd, Melaka	19 Julai 2018 19 July 2018	14
4	Syarikat Hang Tuah Sdn. Bhd., Pulau Pinang	4 September 2018 4 September 2018	13
5.	Thein Chong Sdn. Bhd, Pulau Pinang	5 September 2018 5 September 2018	14



Program Audit Pengeluaran Bersih di premis pembuatan makanan
 Cleaner Production Audit Program at food processing premises

iii) Memperkukuhkan Mekanisma Institusi Industri Hijau

Mesyuarat dan Bengkel Program Promosi Meja Bantuan Industri Hijau dan Penubuhan Meja Bantuan Industri Hijau di Pejabat- Pejabat JAS Negeri

Salah satu komponen Program 'Memperkasakan Amalan Industri Hijau Dalam Kalangan Perusahaan Kecil dan Sederhana (PKS) Ke Arah Pertumbuhan Hijau' di bawah Rancangan Malaysia Kesebelas (RMKe11) adalah Memperkukuhkan Mekanisma Institusi Industri Hijau.

Mewujudkan Meja Bantuan (*helpdesk*) Industri Hijau di semua JAS Negeri adalah salah satu elemen dalam program tersebut. Pada tahun 2018, Unit Industri Hijau, Ibu Pejabat telah membuat perolehan lima (5) unit meja bantuan dan *pop up banner* dalam membantu JAS Negeri mempromosi Industri Hijau.

Meja Bantuan tersebut telah diagihkan kepada lima buah Jabatan Alam Sekitar Negeri iaitu Kelantan, Pahang, Sabah Sarawak dan Wilayah Persekutuan Labuan. Melalui Meja Bantuan ini di pejabat JAS Negeri akan memberi nasihat dan maklumat yang lebih tepat kepada industri untuk melaksanakan Amalan Industri Hijau.

Mesyuarat dan Bengkel membincangkan Prosedur Kerja Pengeluaran Bersih JAS Negeri

Mesyuarat dan bengkel bagi membincangkan deraf Prosedur Kerja Pengeluaran Bersih JAS Negeri telah diadakan pada 6 hingga 9 November 2018 di hotel RHR Bangi. Seramai 54 peserta terdiri daripada pegawai JAS Ibu Pejabat dan JAS negeri telah menghadiri bengkel ini. Bengkel ini juga telah dihadiri

iii) Strengthening Green Industry Institutional Mechanisms

Promotion of Green Industry Helpdesk and the establishment of a Green Industry Helpdesk at DOE State Offices

One of the component of Mainstreaming Green Industry Practices Among Small And Medium Enterprises (SME) Towards Green Growth in RMK-11 is strengthening Green Industry Institutional Mechanisms.

One of the element of this programme is to create Green Industry help desk for all of state office. In 2018, Green Industry Unit at Headquarters has made the acquisition of five (5) unit helpdesk and popup banner to help state office in promoting Green Industry.

The helpdesk has been allocated to five Department of Environment States Office which is Kelantan, Pahang, Sabah, Sarawak and Wilayah Persekutuan Labuan. With Green Industry Helpdesk, DOE state offices were able to give accurate advice and information on implementation of Green Industry Practices.

Meeting and Workshops to discuss the Cleaner Production Standard Operating Procedure for DOE State Office

Meeting and workshop to discuss the Cleaner Production Standard Operating Procedure for DOE State Office was held from 6 to 9 November 2018 at RHR hotel in Bangi. Total number of participant attending the meeting is 54 participants which includes DOE Headquarters and DOE States officers. The Director of



oleh Pengarah Bahagian Penguatkuasa iaitu Tuan Haji Ruslan bin Mohamad dan beliau telah memberi ucapan pada majlis penutup mesyuarat dan bengkel.

Objektif program ini adalah seperti berikut:-

1. Membincangkan SOP Pengeluaran Bersih yang akan diaplikasikan oleh JAS Negeri dalam membuat audit Pengeluaran Bersih di premis;
2. Memuktamadkan SOP yang telah dikemaskini untuk dilaksanakan di JAS Negeri;
3. Meningkatkan dan memperkukuhkan pegawai JAS dalam melaksanakan program Pengeluaran Bersih; dan
4. Memberi pendedahan kepada pegawai JAS tentang Pelaksanaan Amalan Industri Hijau.

Enforcement Department Tuan Haji Ruslan bin Mohamad attending the event and deliver speech at the closing ceremonies of meeting and workshop

The objectives of the programme are:

1. To discuss the Cleaner Production SOP that will be apply by DOE State offices to conduct Cleaner Production program;
2. To finalise the Cleaner Production SOP for implementation at DOE States office;
3. To enhance and strength DOE officers in Clener Production implementation; and
4. To expose DOE officers in implementation of Green Industry practices.



Mesyuarat Dan Bengkel Membincangkan Prosedur Kerja Pengeluaran Bersih JAS Negeri di hotel RHR, Bangi

Meeting and Workshops to discuss the Cleaner Production Standard Operating Procedure for DOE State Office at RHR hotel, Bangi



Pameran dan Promosi Industri Hijau

JAS juga telah terlibat dalam pameran *International Greentech and Eco Products Exhibition and Conference Malaysia, IGEN 2018* yang telah berlangsung pada 17 hingga 20 Oktober 2018 di Pusat Konvensyen Antarabangsa Kuala Lumpur. Pameran ini diadakan dengan kerjasama bahagian-bahagian Jabatan Alam Sekitar yang lain. Selain Ketua Pengarah JAS, Menteri Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim YB. Yeo Bee Yin telah meluangkan masa melawat ruang pameran JAS.



Green Industry Promotion and Exhibitions

DOE also involved in *International Greentech and Eco Products Exhibition and Conference Malaysia, IGEN 2018* held from 17 until 20 October 2018 at Kuala Lumpur Convention Center. The exhibition was organized in collaboration with other department in DOE. Beside DOE Director General, the VIP visitors is Energy, Science, Technology, Environment and Climate Change Minister Yeo Bee Yin.



Lawatan Menteri Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim YB. Yeo Bee Yin dan Ketua Pengarah JAS ke ruang pameran Jabatan Alam Sekitar IGEN 2018 di Pusat Konvensyen Antarabangsa Kuala Lumpur

A visit by Energy, Science, Technology, Environment and Climate Change Minister Yeo Bee Yin and DOE Director General to Department of Environment booth at IGEN 2018 in Kuala Lumpur Convention Center



Lawatan peserta-peserta persidangan ke ruang pameran Jabatan Alam Sekitar pada IGEN 2018, di Pusat Konvensyen Antarabangsa Kuala Lumpur

A visit by conference participants to Department of Environment Booth at IGEN 2018 in Kuala Lumpur Convention Center



Jadual 9.2 : Program Memperkukuhkan Mekanisma Institusi Industri Hijau
Table 9.2 : Strengthening Green Industry Institutional Mechanisms

BIL NO	TARIKH DATE	NAMA SYARIKA /ORGANISASI/PROGRAM COMPANY NAME / ORGANIZATION / PROGRAM	LOKASI LOCATION	CATATAN NOTES
1	13 Mac 2018 13 March 2018	Roadshow dan Taklimat JAS Negeri Workshop on Strengthening the Mechanism of Green Industry Institutions through the Strengthening of Green Industry Programs in State Offices	Jabatan Alam Sekitar Negeri Sabah	Seminar kepada pegawai JAS dan pihak industri Seminar for DOE officers and industry
2	23 April 2018 23 April 2018	Roadshow dan Taklimat CP di JAS Negeri Roadshow CP and DOE State	Jabatan Alam Sekitar Negeri Melaka	Seminar kepada pegawai JAS dan pihak industri. Seminar for DOE officers and industry
3	3 Julai 2018 3 July 2018	Majlis Pembelajaran dan Penyerahan Loji Biodigester, Projek Demonstrasi Amalan Industri Hijau kepada PPNJ Poultry & Meat Sdn. Bhd. Training & Handover Ceremony for Biodigester Plant, Green Industry Practices Demonstration Project to PPNJ Poultry & Meat Sdn. Bhd.	PPNJ Poltry & Meat Sdn. Bhd, Ayer Hitam, Kluang, Johor	Seminar dan bengkel kepada pegawai JAS Seminar & workshop for DOE officers
4	6-10 November 2018 6-10 November 2018	Bengkel Membincangkan Prosedur Kerja Pengeluaran Bersih JAS Negeri Meeting and Workshops to discuss the Cleaner Production Standard Operating Procedure for DOE State	Hotel RHR, Bangi	Seminar kepada pegawai JAS Seminar for DOE officers

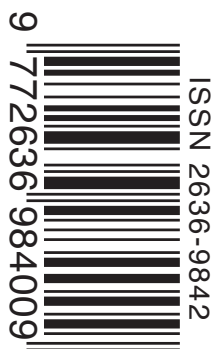


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