LAPORAN TAHUNAN 2017
ANNUAL REPORT

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 2017

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KANDUNGAN
CONTENT

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 Plam Oil
DB	Desibel	Decibel (s)
DOE	Jabatan Alam Sekitar	Department of Environment
DOKUMAS	Sistem Pengurusan Dokumen	Document Managment 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 Penguna-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	Global Environment Facility
GIS	Sistem Maklumat Geografik	Geograpical 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	Kumbahan & Effluen-Effluen Perindustrian	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
MICCI	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-Governmentnal 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
UIA	Universiti Islam Antarabangsa	International Islamic University

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
UNPD	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

"Alam Sekitar, Tanggungjawab Bersama "

DATO' DR. AHMAD KAMARULNAJUIB CHE IBRAHIM
Ketua Pengarah, Jabatan Alam Sekitar
Director-General, Department of Environment

Jabatan Alam Sekitar dengan sukacitanya membentangkan Laporan Tahunan 2017 yang merangkumi pencapaian Jabatan dalam melaksanakan mandatnya untuk mentadbir Akta Kualiti Alam Sekeliling, 1974.

The Department of Environment wishes to present the 2017 Annual Report which provides an overview of its accomplishments in executing its mandate to administer the Environmental Quality Act, 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.

Continued emphasis is given to the prevention and controlling of water pollution, air pollution and scheduled waste management. Inspection on polluting sources and legal actions are taken against the perpetrators.

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.

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

Selaras dengan pindaan Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling) 2015, tiga (3) garispanduan baharu telah diterbitkan bagi membantu jururunding EIA menjalankan kajian penilaian impak alam sekitar untuk aktiviti pembangunan dan menjadi rujukan kepada semua pihak berkepentingan. Garispanduan tersebut adalah:

In accordance with the Amendment of the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015, three (3) new guidelines have been published to assist EIA consultants to carry out Environmental Impact Assessment for development activities and as reference to all stakeholders. The guidelines are:

i. *Environmental Impact Assessment Guidelines For Development in Hill and Slope*

ii. *Environmental Impact Assessment Guidelines For Development in Coastal and Marine Parks*

iii. *Environmental Impact Assessment Guidelines For Development in National and State Park.*

i. Environmental Impact Assessment Guidelines For Development in Hill and Slope

ii. Environmental Impact Assessment Guidelines For Development in Coastal and Marine Parks

iii. Environmental Impact Assessment Guidelines For Development in National and State Park

Pada tahun 2017, JAS telah membuat penambahbaikkan terhadap kawalan pencemaran alam sekitar bagi projek pembangunan industri dengan menerbitkan garispanduan baharu yang lebih komprehensif dan praktikal bertajuk *Environmental Essentials For Siting of Industries in Malaysia (EESIM) 2017*. JAS turut menerbitkan *Guidelines On Land Disturbing Pollution Prevention and Mitigation Measures* bagi menambahbaik aspek kawalan hakisan tanah dan sedimen dalam kajian kesan kepada alam sekeling (EIA).

In 2017, DOE enhanced the study of environmental pollution control for industrial development projects by more comprehensive and practical guidance titled Environmental Essentials For Siting of Industries in Malaysia (EESIM) 2017. DOE also published Guidelines On Land Disturbing Pollution Prevention and Mitigation Measures to enhance soil erosion and sediment aspect in EIA.

Pada tahun 2017, JAS telah melaksanakan Program Pengawasan Kualiti Alam Sekitar (*Environmental Quality Monitoring Programme,* EQMP) bagi memantapkan pengawasan kualiti alam sekitar merangkumi pengumpulan data kualiti udara, kualiti air sungai dan kualiti air marin.

In 2017, DOE has implemented The Environmental Quality Monitoring Programme, EQMP to strengthen the quality of environmental monitoring including the collection of air quality data, river water quality and marine water quality.

Pusat Data Alam Sekitar (*Environmental Data Centre*, EDC) telah ditubuhkan sebagai pusat setempat bagi pemantauan kualiti alam sekitar negara. EDC juga bertindak sebagai pusat kawalan ketika berlaku insiden alam sekitar dan memastikan program pemantauan kualiti alam sekitar beroperasi secara bersepadu dan lancar.

The Environmental Data Centre (EDC) was set up as one stop center for national environmental quality monitoring. EDC also act as a centralized command center during environmental incidences and ensures that environmental quality monitoring programs operate in an integrated and streamlined manner.

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.

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.

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 dan lestari serta meningkatkan kualiti kehidupan.

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 environment and enhanced quality of life.

Alam Sekitar, Tanggungjawab Bersama

Environment, Our Shared Responsibility

DATO' DR. AHMAD KAMARULNAJUIB CHE IBRAHIM

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

MISI dan VISI

Mision and Vision

VISI
VISION

Pemuliharaan Alam Sekitar
Untuk Kesejahteraan Rakyat
Environmental Conversation 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

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

Pembangunan Lestari Melalui Pemuliharaan Sumber Semulajadi
Sustainable Development Through Conservation Of Resources

Pencegahan Dan Kawalan Pencemaran
Pollution Prevention And Control

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

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

Penyertaan Awam Dalam Pengurusan Alam Sekitar
Public Participation In Environmental Management

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

BAB 1
CHAPTER 1

AKTIVITI MAJLIS KUALITI ALAM SEKELILING (EQC) BAGI TAHUN 2017
ENVIRONMENTAL QUALITY COUNCIL (EQC) ACTIVITIES FOR YEAR 2017

Dalam tahun 2017, Majlis Kualiti Alam Sekeliling (EQC) telah bermesyuarat sebanyak empat (4) kali:

i. Mesyuarat EQC Bilangan Ke 121 telah diadakan pada 6 Februari 2017;
ii. Mesyuarat EQC Bilangan Ke 122 telah diadakan pada 16 Mei 2017;
iii. Mesyuarat EQC Bilangan Ke 123 telah diadakan pada 10 Ogos 2017; dan
iv. Mesyuarat EQC Bilangan Ke 124 telah diadakan pada 6 Disember 2017.

Perlantikan ahli-ahli EQC bagi penggal ke 15 telah dibuat oleh YB Menteri Sumber Asli Dan Alam Sekitar. Tempoh penggal 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 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 2017 adalah seperti berikut:-

Perbincangan EQC ke 121

1. Pencemaran Air di Malaysia : Penyelesaian Menurut Prinsip 'Subsidiarity' dan Kerjasama Federalisme (UKM)
2. Insiden Pencemaran Bau Air Mentah Di Sungai Semenyih (JAS)
3. Halatuju Majlis Kualiti Alam Sekeliling (ENSEARCH)
4. Cadangan Pindaan Perintah Kualiti Alam Sekeliling (Aktiviti Yang Diisytiharkan) (Pembakaran Terbuka) 2003 Di Bawah Akta Kualiti Alam Sekeliling 1974 (JAS)
5. Draf Perintah Kualiti Alam Sekeliling (Pewakilan Kuasa) 20XX (JAS)
6. Pembangunan Sistem Pangkalan Data Hydrocarbon Fingerprinting (JAS)
7. Penambahbaikan Garis Panduan *Environmental Impact Assessment (EIA) Guideline In Malaysia 2016* (JAS)

The Environmental Quality Council (EQC) had four (4) meetings in 2017. The meetings were held as follows:-

i. the 121st EQC meeting was held on 6th February, 2017;
ii. the 122nd EQC meeting was held on 17th May, 2017;
iii. the 123rd EQC meeting was held on 10th August, 2017; and
iv. the 124th EQC meeting was held on 6th December, 2017.

The appointment for EQC members for the 15th term was made by the Minister of Natural Resources and Environment for the period from 1st April 2015 till 31st March 2018. The Chairman appointed is YBhg. Prof. Dato' Dr. Mazlin Mokhtar, Principal Fellow at the Institute for Environment and Development (LESTARI), The National University of Malaysia. The latest 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 2017 were as followed:-

121st EQC Discussion :

1. Water Pollution in Malaysia: Solution According to the Principles of Subsidiarity and Federalism Cooperation (UKM)
2. Incident of Water Pollution In Sungai Semenyih (DOE)
3. Way Forward of EQC Council (ENSEARCH)
4. Proposed Amendments to Environmental Quality (Declared Activities) (Open Burning) Order 2003 Under the Environmental Quality Act 1974 (DOE)
5. Draft Environmental Quality Ordinance (Power Delegation) 20XX (DOE)
6. Development of Database Hydrocarbon Fingerprinting Database (DOE)
7. Improvements to the Environmental Impact Assessment Guidelines (EIA) Guideline In Malaysia 2016 (DOE)

Perbincangan EQC ke 122

1. The Implementation Of Responsible Care Program In Chemical Industries Of Malaysia (UKM)

2. Initiatives on Chemicals and Hazardous Substances Management in Malaysia Supporting SDGs and Sustainable Development in Malaysia (UKM)

3. Gubalan Baru Akta Alam Sekitar (JAS)

122nd EQC Discussion

1. The Implementation Of Responsible Care Program In Chemical Industries Of Malaysia (UKM)

2. Initiatives on Chemicals and Hazardous Substances Management in Malaysia Supporting SDGs and Sustainable Development in Indonesia (UKM)

3. New Draft of the Environmental Act (DOE)

Perbincangan EQC ke 123

1. Constructed Wetlands System to Treat Wastewaters to Control Pollution of Coastal Zones and Waterways (Frangipani Langkawi Resorts & Spa)

2. Latest Initiatives On Carbon Emission Reduction Efforts And Its Relation To Pollution Control and Sustainable Development. (NRE)

123rd EQC Discussion

1. Constructed Wetlands System to Treat Wastewaters to Control Pollution of Coastal Zones and Waterways (Frangipani Langkawi Resorts & Spa)

2. Latest Initiatives On Carbon Emission Reduction Efforts And Its Relation To Pollution Control and Sustainable Development. (NRE)

Perbincangan EQC ke 124

1) Inisiatif Konservasi WWF Malaysia

- Central Forest Spine & Tiger Conservation
- Coral Triangle
- Heart of Borneo
- WWF Malaysia

2) Garis Panduan Baharu EIA

- EIA Guidelines For Development In National And State Parks
- EIA Guidelines For Development In Slope And Hill Areas
- EIA Guidelines For Development In Coastal Areas And Marin Parks
- EIA Guidelines For Land-Disturbing Pollution Prevention And Mitigation Measures (LDP2M2)

124th EQC Discussion

1) WWF Malaysia Conservation Initiative

- Central Forest Spine & Tiger Conservation
- Coral Triangle
- Heart of Borneo
- WWF Malaysia

2) New EIA Guidelines

- EIA Guidelines For Development In National And State Parks
- EIA Guidelines For Development In Slope And Hill Areas
- EIA Guidelines For Development In Coastal Areas And Marin Parks
- EIA Guidelines For Land-Disturbing Pollution Prevention And Mitigation Measures (LDP2M2)

Jadual 1 JAS: Senarai Ahli Majlis Kualiti Alam Sekeliling Penggal Ke-15 (1 April 2015 – 31 Mac 2018)

Table 1 DOE: 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
4	Wakil Menteri Kementerian Sains, Teknologi dan Inovasi Representative for Minister, Ministry of Science, Technology and Innovation	Dr. Zulkifli Mohamed Hashim
5	Wakil Menteri Kementerian Perdagangan Antarabangsa dan Industri Representative for Minister, Ministry of Trade & Industry	Tuan Haji Zakaria Jaafar
6	Wakil Menteri Kementerian Perdagangan Dalam Negeri Koperasi dan Kepenggunaan Representative for Minister, Ministry of Domestic Trade, Corporation & Consumerism	Cik Fatihah Nazaliza binti Mohd. Nasir
7	Wakil Menteri Kementerian Pertanian dan Industri Asas Tani Representative for Secretary-General, Ministry of Agriculture and Agro-Base Industries	YBhg. Datuk Ahmad bin Loman
8	Wakil Menteri Kementerian Sumber Manusia Representative for Minister, Ministry of Human Resources	Tuan Haji Saiful Azhar Mohd Said
9	Wakil Menteri Kementerian Pengangkutan Representative for Minister, Ministry of Transport	Encik Misrun Timin
10	Wakil Menteri Kementerian Perumahan dan Kerajaan Tempatan Representative for Minister, Ministry of Urban Wellbeing, Housing and Local Government	Encik Ismail Bin Mokhtar
11	Wakil Menteri Kementerian Tenaga, Teknologi Hijau dan Air Representative for Minister, Ministry of Energy, Green Technology and Water	Puan Rogayah binti Kadari
12	Wakil Menteri Kementerian Kesihatan Malaysia Representative for Minister, Ministry of Health	YBhg. Datuk Dr. Lokman Hakim bin Sulaiman
13	Wakil Kerajaan Negeri Sabah Representative from the Sabah Government	Datu Rosmadi Datu Sulai
14	Ahli Giliran Alternate Member	Tuan Haji Mohd. Yusrie Abdullah
15	Wakil Kerajaan Negeri Sarawak Representative from the Sarawak Government	YBhg. Datu Sudarsono Osman
16	Ahli Giliran Alternate Member	Encik Peter Sawal

Bil	Perwakilan *Delegation*	Nama *Name*
17	Wakil Industri Petroleum Representative from the Petroleum Industry	Mohamed Amin B Abdullah
18	Ahli Giliran Alternate Member	Cik Lee Tzee Wan
19	Wakil Industri Kelapa Sawit Representative from the Oil Palm Industry	YBhg. Prof. Emeritus Dato' Dr. Makhdzir Mardan
20	Ahli Giliran Alternate Member	Dr. Ruslan Abdullah
21	Wakil Persekutuan Pekilang-Pekilang Malaysia (FMM) Representative from the Federation of Malaysian Manufacturers	YBhg. Dato' Hj. Mizanur Rahman Ghani
22	Ahli Giliran Alternate Member	Encik K.N. Gobinathan
23	Wakil Industri Getah Representative from the Rubber Industry	Encik Lim Sum Teck
24	Ahli Giliran Alternate Member	Encik Chin Hon Meng
25	Wakil Kakitangan Akademik Representative from the Academic Staff of the Universities or Colleges in Malaysia	Dr. Subramaniam Karuppannan
26	Ahli Giliran Alternate Member	-
27	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
28	Ahli Giliran Alternate Member	Puan Geetha P.Kumaran
29	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
30	Ahli Giliran Alternate Member	Dr Sundari Ramakrishna

BAB 2
CHAPTER 2

PENGURUSAN SUMBER MANUSIA DAN KEWANGAN
HUMAN RESOURCES AND FINANCIAL MANAGEMENT

Bahagian Pentadbiran dan Kewangan telah diberi tanggungjawab untuk merancang, melaksana dan memantau aktiviti pentadbiran am, pengurusan sumber manusia dan kewangan. Bahagian ini dibahagikan kepada lima seksyen utama iaitu Seksyen Pentadbiran dan Inovasi, Seksyen Sumber Manusia, Seksyen Kewangan, Seksyen Pembangunan dan Seksyen Pengurusan Aset.

The Administration and Finance Division is responsible for planning, executing and monitoring general administrative activities, human resource management and finance. This is been divided into five (5) sections comprises of Innovation and administration Section, Human Resources Section, Finance Section, Development Section and Asset Management Section.

Seksyen Pentadbiran dan Inovasi

Aktiviti-aktiviti yang telah dianjurkan oleh Seksyen ini pada tahun 2017 antaranya ialah:

i. Kursus Transformasi Kepimpinan Sinergistik Berkumpulan pada 29 Mac hingga 31 Mac 2017 di Sik, Kedah.

ii. Bengkel Pengharmonian Deraf Klasifikasi Fail Fungsi JAS pula telah diadakan pada 16 Februari hingga 17 Februari 2017 di Bilik Cempaka, Aras 3 Jabatan Alam Sekitar. Bengkel ini bertujuan mewujudkan keseragaman klasifikasi fail di pejabat awam ke arah pelaksanaan Sistem Pengurusan Rekod Elektronik.

iii. Bengkel review Polisi Keselamatan dan Kesihatan Pekerjaan Jabatan Alam Sekitar dan Penyediaan Dokumen Semakan Jabatan Keselamatan dan Kesihatan Pekerjaan diadakan pada 26 September hingga 28 September 2018 di Bilik Cempaka, Aras 3, Jabatan Alam Sekitar.

iv. Taklimat Ekosistem Kondusif Sektor Awam (EKSA) telah diadakan bagi memberi pendedahan awal kepada warga Jabatan Alam Sekitar pada 22 Mac 2017 di Dewan Baiduri, Kementerian Sumber Asli dan Alam Sekitar.

Innovation and Administration Section

In 2017, this section condudted the following activities:

i. Group Synergistic Leadership Transformation Course on 29th March to 31st March, 2017 at Sik, Kedah

ii. Workshop on Harmonization of DOE Function File Classification Draft on 16th February to 17th February, 2017 at Cempaka Room, Level 3, Department of Environment Office. The objective of this workshop is to create a syncronise file classification in the office to align with the execution of the Electronic Record Management System.

iii. Workshop on Reviewing DOE's Occupatinal Safety and Health Policy and Preparation of Reviewing Document For Occupational Safety and Health Department was held on 26th September to 28th September, 2017 at Cempaka Room, Level 3, Department of Environment.

iv. The Public Sector Conducive Ecosystem (PSCE) Briefing was held to give the early exposure to DOE officers on 22nd March, 2017 at Baiduri Hall, Department of Environment, Ministry of Natural Resources & Environment.

Sumber Manusia
Human Resource

sehingga 31 Disember 2017
Jumlah perjawatan di
Jabatan Alam Sekitar

As in total up to 31st
December, 2017

1,538
dengan pengisian
sejumlah
1,481
= **96.29%**

1,538
with total
composition of
1,481

= **99.93%**

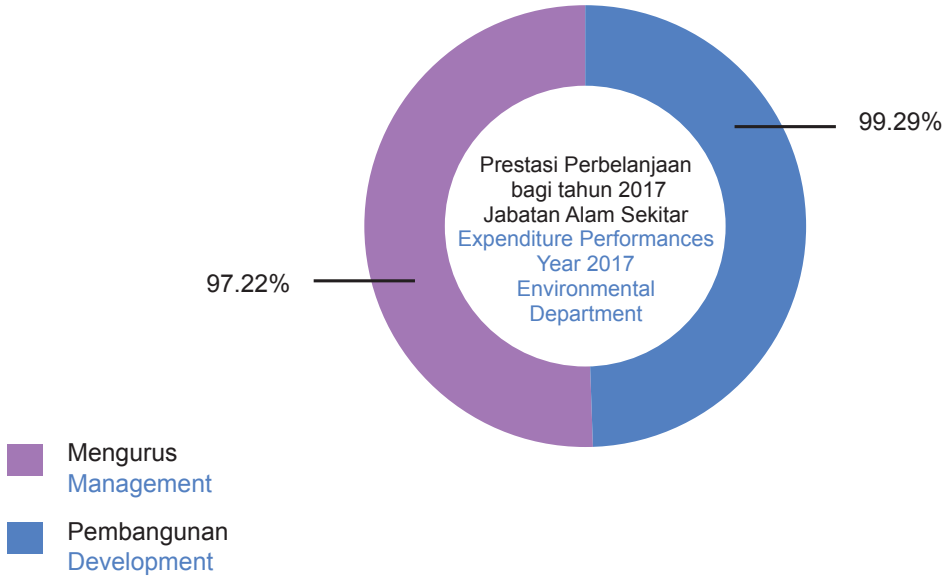
Menjalani kursus melebihi 4 hari
Successfully attended more than 4 days

= **117**
orang pegawai
officers

menerima Anugerah Perkhidmatan Cemerlang
pada majlis yang diadakan pada
8 Mac 2018 di MAEPS, Serdang
received Excellent Service Award at the ceremony
held on 8th March 2018 in MAEPS, Serdang

Kewangan
Finance

Rajah 2.1 JAS: Carta menunjukkan agihan penggunaan peruntukan bagi perbelanjaan mengurus dan perbelanjaan pembangunan bagi tahun 2017
Figure 2.1 DOE: The chart shows the allocation for budget operational expeniture and development projects in 2017



Rajah 2.2 JAS: Carta menunjukkan prestasi perbelanjaan mengurus dan pembangunan bagi tahun 2017
Figure 2.2 DOE: Chart shows the performances of operational expenditure and development projects in 2017

Pada Tahun 2017 JAS Ibu pejabat telah menerima 2 Sijil penghargaan daripada Ketua Setiausaha, Kementerian Sumber Asli dan Alam Sekitar iaitu:

i. Anugerah PTJ Cemerlang Pengurusan Sistem Perancangan dan Kawalan Belanjawan (e-SPKB);

ii. Membelanjakan 99.29% daripada Peruntukan Pembangunan Tahun 2017 melebihi pencapaian Purata Nasional (99.03%)

Pengurusan Aset

Tahun 2017 merupakan tahun transformasi bagi Seksyen Pengurusan Aset dimana seksyen ini telah berjaya melaksanakan integrasi dan migrasi dalam Sistem Pemantauan dan Pengurusan Aset (SPPA). Integrasi ini melibatkan kod Pusat Tanggungjawab (PTJ) kewangan dan maklumat organisasi SPPA dengan maklumat Kod Bussiness Unit (BU) Sistem HRMIS. Manakala migrasi pula melibatkan Sistem Pemantauan dan Pengurusan Aset (SPPA), Sistem Aset Tak Alih (MySPATA) dan Sistem Perakaunan Akruan 1GFMAS.

In 2017, DOE Headquarters received two (2) Appreciation Certificate from KSU NRE which are:

i. PTJ Cemerlang Pengurusan Sistem Perancangan dan Kawalan Belanjawan Award (e-SPKB) ;

ii. Spent 99.29% from 2017 Development Allocation that exceeded national average achievement (99.03%)

Asset Management

2017 was the year of transformation for Asset Management Section where this section successfully implemented migration and integration in Asset Monitoring and Management System (SPPA). This integration involves the financial Reponsibility Center code (PTJ) and SPPA organization information with Business Unit (BU) HRMIS System while migration involves SPPA, Fixed Asset System (mySSPATA) and 1 Government Financial Management Accounting System.

Semua kerja-kerja ini merupakan *start-up* bagi sistem pengurusan aset yang baharu tahun 2018. SPPA 2018 baharu akan mempunyai lapan (8) sub sistem seperti dibawah :

- Sistem Pengurusan Aset Alih (SPA)
- Sistem Pengurusan Stor (SPS)
- Sistem Pengurusan Aset Hidup (SPAH)
- Sistem Pengurusan Aset Tak Ketara (SPATK)
- SPPA Ticketing System (STS)
- Pusat Rujukan Maklumat SPPA
- Course Management System(CMS)
- Total Asset Management(TAM)

All of the process is a start-up to the new 2018 asset management system. The new SPPA will consist of eight (8) sub system as belows :

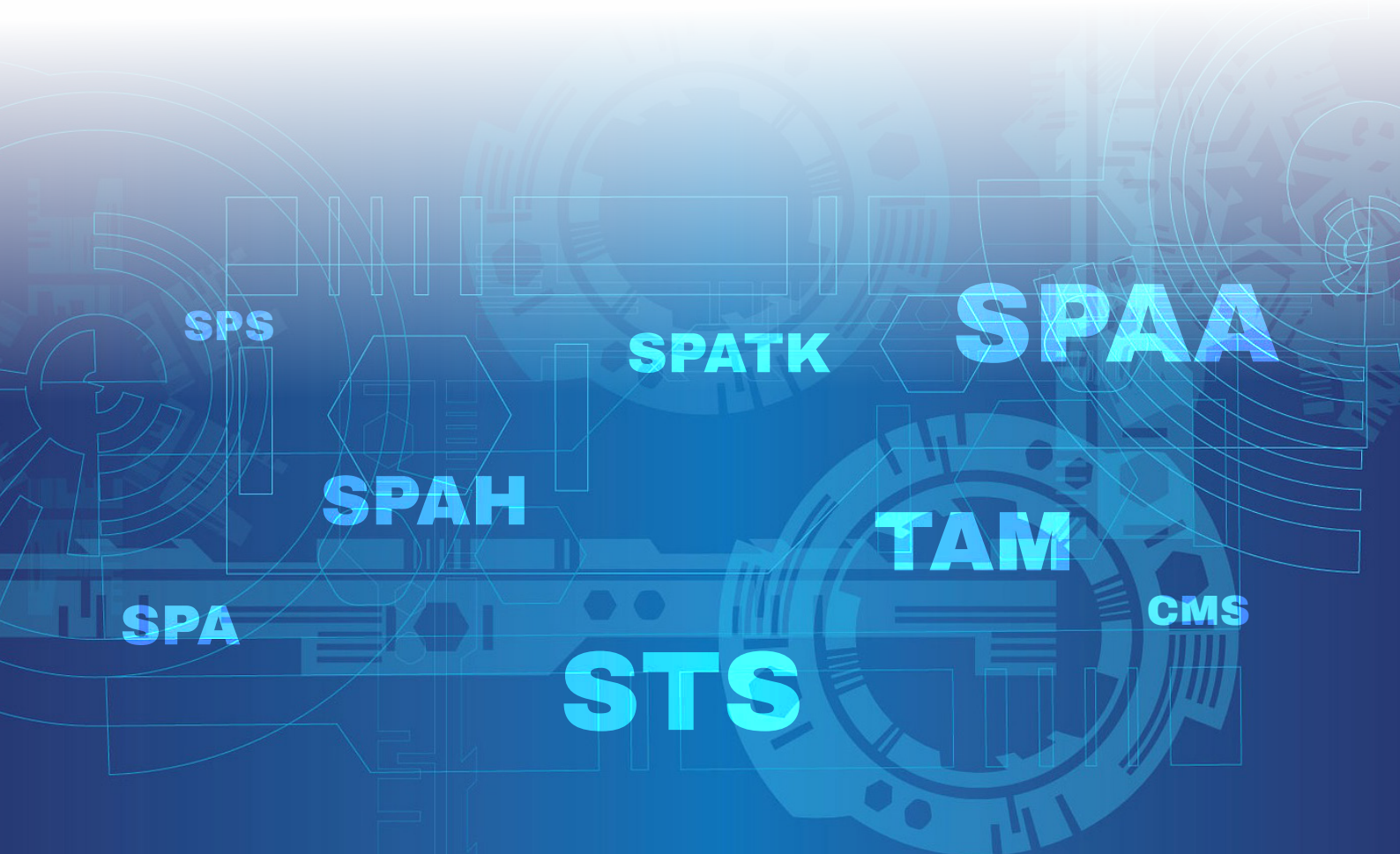
- Immovable Asset System (IAS)
- Store Management System (SMS)
- Asset Management System (AMS)
- Intangible Asset Management System (IAMS)
- SPPA Ticketing System (STS)
- SPPA Information Reference Center
- Course Management System (CMS)
- Total Asset Management (TAM)

Bagi memastikan Perakaunan Akruan Kerajaan 2018 berjaya dilaksanakan, Seksyen Pengurusan Aset dengan kerjasama Kementerian Sumber Asli dan Alam Sekitar (NRE) telah menghantar pegawai-pegawai Jabatan Alam Sekitar (JAS) mengikuti kursus, bengkel dan taklimat yang diperlukan. Sebanyak empat belas (14) kursus, bengkel dan taklimat telah dilaksanakan sepanjang tahun 2017 melibatkan 200 pegawai JAS.

To ensure the 2018 Government Accrual Accounting successfully implemented, Asset Management Section in collaboration with Ministry of Natural Resources and Environment (NRE)had required DOE officers to attend the neceessary courses, workshop and briefing. There were fourteen (14) courses, workshop and briefing in 2017 involving 200 DOE officers.

Hasil dari komitment dan usaha berterusan, seluruh warga kerja Jabatan Alam Sekitar telah menggunakan sepenuhnya SPPA dan MySPATA secara atas talian di semua pejabat JAS seluruh Malaysia.

As result of ongoing effort and comitment, all DOE staffs have fully utilized the online SPPA and MySPATA at all DOE's offices throughout Malaysia.



BAB 3
CHAPTER 3

PENILAIAN KESAN KEPADA ALAM SEKELILING DAN INPUT KEPADA PERANCANGAN PEMBANGUNAN
ENVIRONMENTAL IMPACT ASSESSMENT AND INPUT FOR DEVELOPMENT

Penilaian Kesan Kepada Alam Sekeliling (EIA) merupakan satu alat perancangan untuk mengelakkan dan mengurangkan kesan-kesan kepada alam sekitar akibat aktiviti pembangunan. Ianya juga dapat menghindarkan perbelanjaan yang tidak sepatutnya dalam pelaksanaan projek yang disebabkan oleh kerosakan alam sekitar semasa pelaksanaan projek.

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 the project implementation caused by damage to the environment during project implementation.

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 diluluskan dan dilaksanakan.

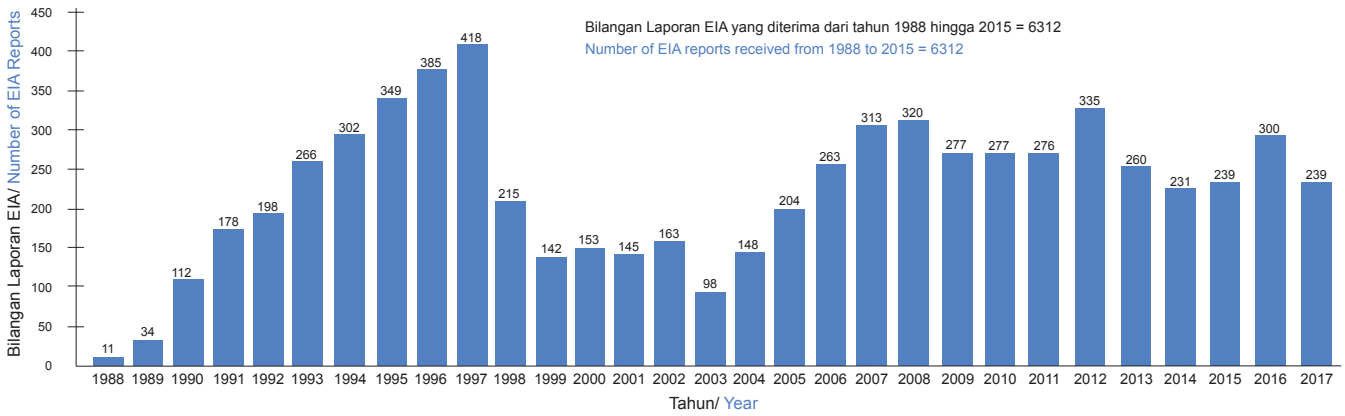
EIA is a study to identify, predict, evaluate and communicate information about the impacts on the environment of a proposed project and to detail out the mitigating measures prior to project approval and implementation.

Laporan EIA 2017

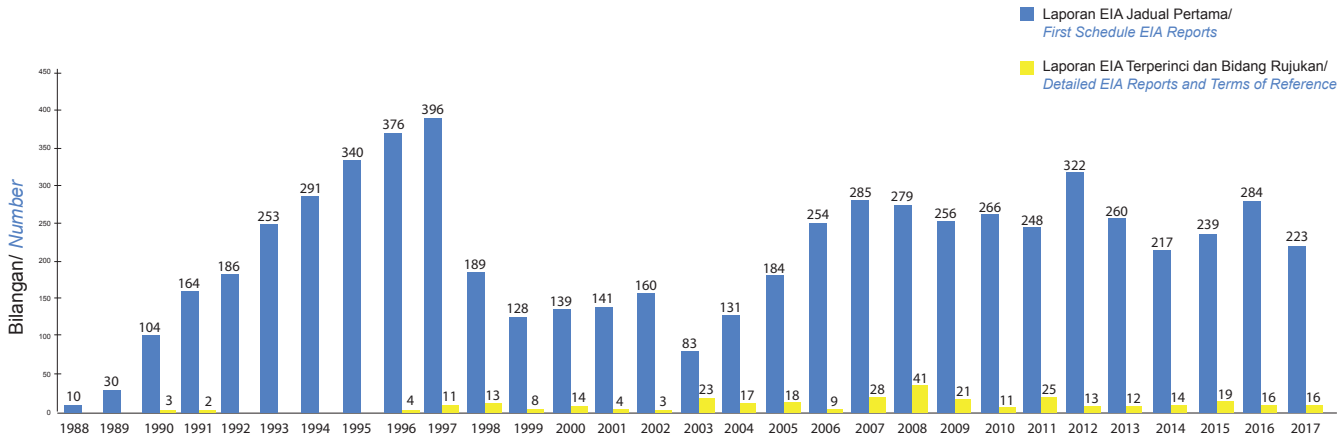
Sejumlah 239 laporan telah diterima dan diproses oleh Jabatan Alam Sekitar pada tahun 2017 **(Rajah 3.1)**. Daripada bilangan ini, sebanyak 223 laporan EIA adalah EIA Jadual Pertama dan enam belas (16) laporan EIA adalah EIA Jadual Kedua **(Rajah 3.2)**, tiada Laporan EIA di Zon Ekonomi Eksklusif (ZEE) dan dua (2) Laporan dengan projek yang melibatkan dua (2) negeri. Negeri Selangor dan Pahang menerima bilangan laporan EIA tertinggi pada tahun 2017 sebanyak tiga puluh enam (36) laporan diikuti Negeri Kelantan sebanyak tiga puluh satu (31) laporan **(Rajah 3.3)**. Aktiviti perhutanan merupakan aktiviti yang paling banyak diterima laporan EIA pada tahun 2017 iaitu sebanyak tiga puluh enam (36) laporan **(Rajah 3.4)**.

EIA Reports 2017

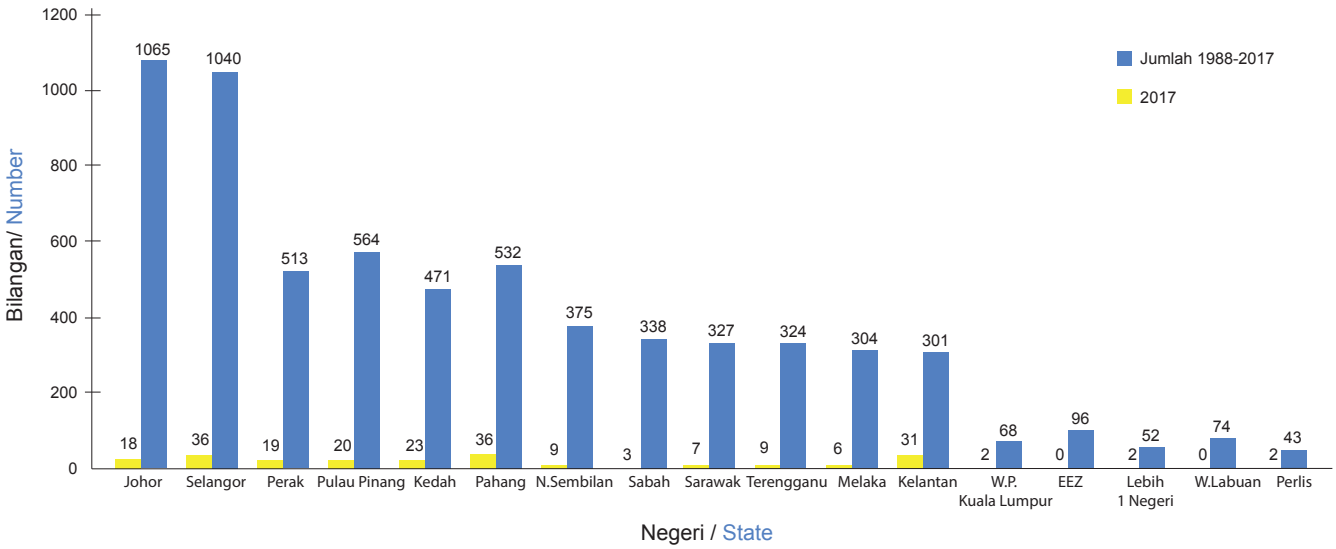
A total of 239 reports were received and processed by the Department of Environment in 2017 **(Figure 3.1)**. Of these, 223 reports are First Schedule reports and sixteen(16) reports are the Second Schedules EIA reports **(Figure 3.2)**, no EIA Reports for the project in the Exclusive Economic Zone (EEZ) and two (2) EIA reports for the project involving two (2) states. Selangor and Pahang state received the highest number of EIA reports in 2017, a total of thirty six (36) reports each, followed by Kelantan state, thirty one (31) reports **(Figure 3.3)**. According to type of activites, the highest number of EIA reports received in 2017 was for forestry with a total of thirty six (36) reports **(Figure 3.4)**.



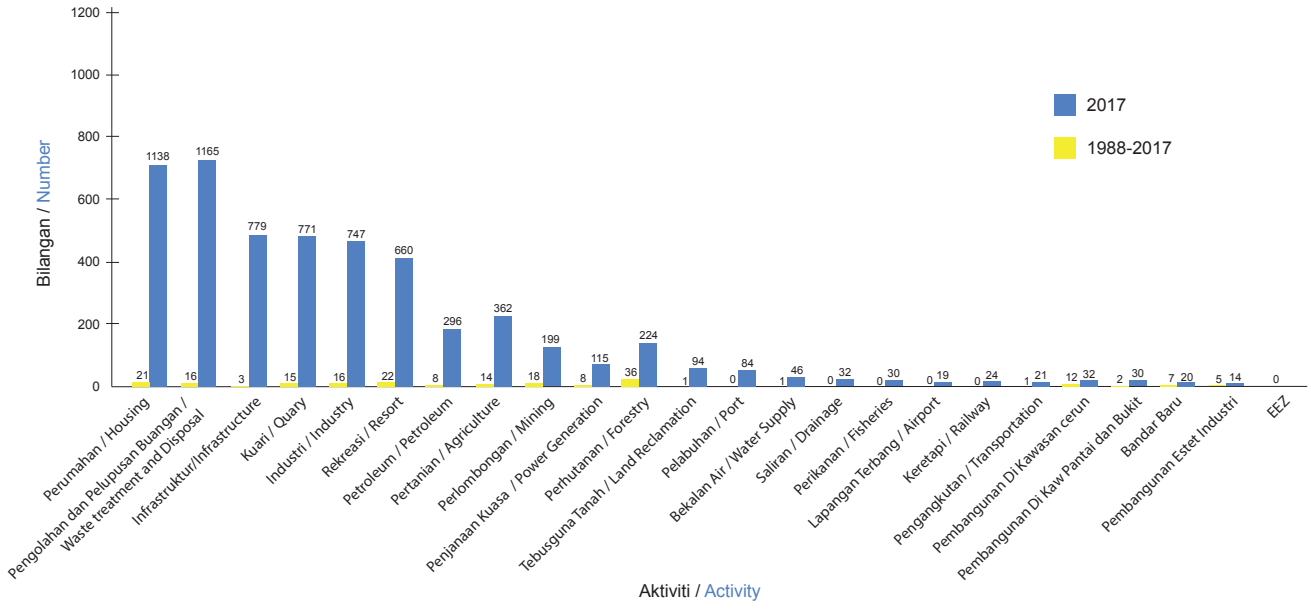
Rajah 3.1 JAS : Bilangan Laporan EIA yang Diterima Mengikut Tahun, 1988 - 2017
Figure 3.1 DOE : Number of EIA Reports Received By Year , 1988 - 2017



Rajah 3.2 JAS :Bilangan Laporan EIA dan Jenis Laporan Diterima, 1988 - 2017
Figure 3.2 DOE : Number and Type of EIA Reports Received, 1988 - 2017



Rajah 3.3 JAS : Bilangan Laporan EIA Yang Diterima Mengikut Negeri, 1988-2017
Figure 3.3 DOE: Number of EIA Reports Received By State 1988-2017



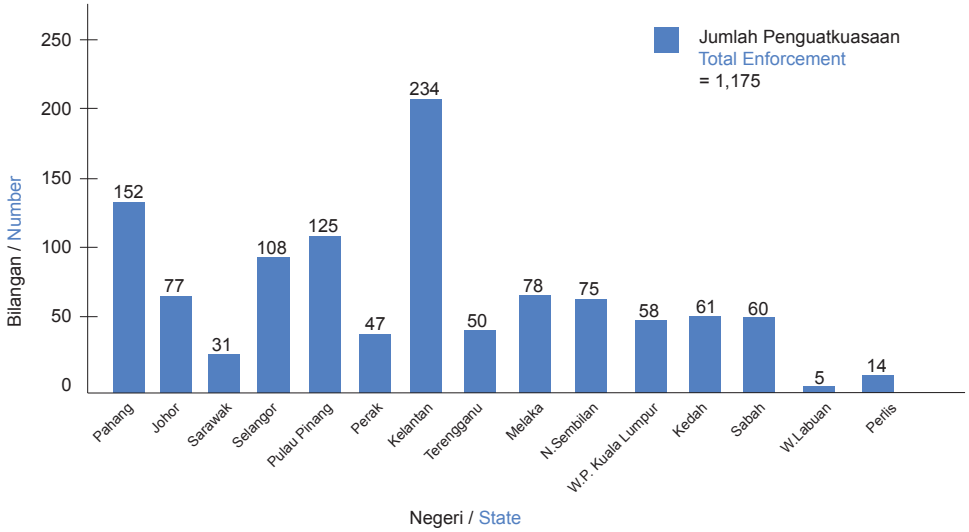
Rajah 3.4 JAS : Bilangan Laporan EIA yang Diterima Mengikut Aktiviti - 1988-2017
Figure 3.4 DOE : Number of EIA Reports Received by Activity- 1988-2017

Siasatan Penguatkuasaan Projek EIA

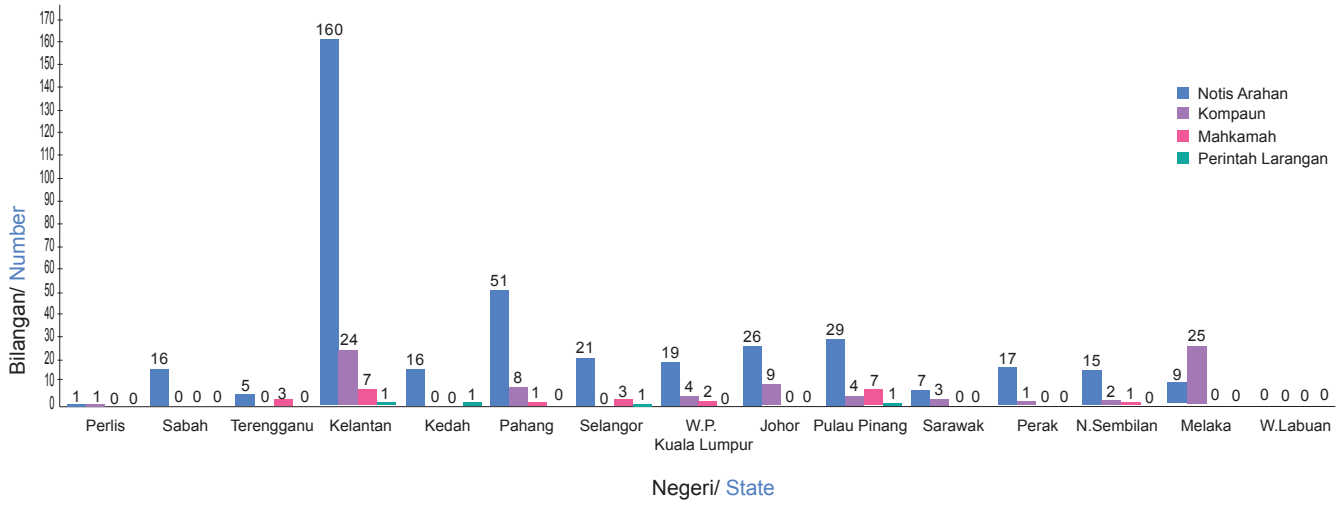
Sejumlah 1,175 siasatan penguatkuasaan telah dijalankan pada tahun 2017 untuk mengenalpasti status pembangunan dan pematuhan projek-projek EIA **(Rajah 3.5)**. Daripada bilangan siasatan tersebut, sejumlah 392 notis arahan, lapan puluh satu (81) kompaun telah dikeluarkan manakala dua puluh empat (24) kes telah didakwa di mahkamah kerana tidak mematuhi syarat-syarat kelulusan EIA. Dalam pada itu, sebanyak empat (4) Perintah larangan di bawah Seksyen 34AA juga telah dikeluarkan **(Rajah 3.6)**

EIA Enforcement Investigations

A total of 1,175 enforcement inspections on EIA projects were conducted in 2015, to check the project development status and the compliance of EIA approval conditions. **(Figure 3.5)**. From the inspections, a total of 392 notices, eighty one (81) compounds were issued and twenty four (24) cases were charged in court for not complying with the conditions of the EIA. Approval four (4) prohibition order under Section 34AA also been issued to the project proponents **(Figure 3.6)**



Rajah 3.5 JAS : Siasatan Penguatkuasaan Projek EIA, 2017
Figure 3.5 DOE : Post EIA Enforcement Investigation, 2017



Rajah 3.6 JAS: Tindakan Susulan Penguatkuasaan Post EIA Tahun 2017
Figure 3.6 DOE : Follow Up Action Of EIA Enforcement Investigations 2017

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 enam puluh tujuh (67) permohonan telah diterima pada tahun 2017 di mana hanya 30 layak untuk didaftarkan. Butiran adalah seperti di **Jadual 3.1.**

Sehingga 31 Disember 2017, sebanyak 1,267 individu telah berdaftar di bawah Skim Pendaftaran Jururunding EIA, dimana 331 orang adalah Jururunding EIA, 359 orang Jururunding Subjek dan 577 orang adalah Penolong Jururunding **(Jadual 3.2).**

Tempoh sah pendaftaran bagi Jururunding EIA adalah selama tiga (3) tahun, manakala Jururunding Subjek pula adalah lima (5) 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 1st June, 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 sixty seven (67) applications were received in 2017 where only 30 were qualified to be registered. Details are as in **Table 3.1**

As of 31st December, 2017, DOE has registered 1,267 individuals under this EIA Consultant Registration Scheme where 331 are EIA Consultants, 359 are Subject Consultants and 577 are Assistant Consultants **(Table 3.2)**.

Validity period for registration of EIA Consultants is three (3) years, whereby Subject Consultant is five (5) years. Renewal is required at the end of the validity period to remain active.

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

Jadual 3.1 JAS : Jumlah Permohonan yang Diluluskan Bagi Tahun 2017
Table 3.1 DOE : Number of Applications Approved 2017

Kategori Category	Jumlah Permohonan No. Of Application	Jumlah Lulus No. Of Application Approved	Peratus Lulus(%) Percentage Approved (%)
Jururunding EIA *EIA Consultant*	37	14	38
Jururunding Subjek *Subject Consultant*	29	15	51
Penolong Jururunding *Assistant Consultant*	1	1	100
Jumlah Total	67	30	44

Jadual 3.2 JAS : Jumlah Keseluruhan Jururunding Berdaftar Sehingga 31 Disember 2017
Table 3.2 DOE : Number of Registered Consultants Until 31st December, 2017

Kategori Category	JumlahDiluluskan No. of Application Approved	Peratusan (%) Percentage (%)
Jururunding EIA EIA Consultant	331	26
JururundingSubjek Subject Consultant	359	28
PenolongJururunding/ Assistant Consultant	577	46
Jumlah Total	1,267	100

Skim Pendaftaran Juruaudit Alam Sekitar

Skim Pendaftaran Juruaudit Alam Sekitar telah mula diperkenalkan pada 1 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 2017, sebanyak empat (4) permohonan baru telah diterima dan satu (1) daripadanya telah didaftarkan sebagai Juruaudit Alam Sekitar manakala bagi permohonan pembaharuan, pihak jabatan telah menerima dua puluh sembilan (29) permohonan dan dua puluh dua (22) permohonan telah diluluskan **(Jadual 3.3)**. Sehingga 31 Disember 2017, sebanyak sembilan puluh sembilan (90) orang individu telah didaftarkan sebagai Juruaudit Alam Sekitar.

Tujuan utama skim pendaftaran ini adalah untuk memastikan hanya individu yang benar-benar 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.

Skim ini memastikan pelaksanaan audit dan pelaporan audit alam sekitar adalah mengikut prosedur dan garispanduan 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.

Environmental Audit Registration Scheme

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

For 2017, a total of four (4) new applications were processed and one (1) auditor have been successfully registered as Environmental Auditor while for the renewal application, the department received twenty nine (29) applications and twenty two (22) applications have been approved **(Table 3.3)**. Until 31st December, 2017, a total of ninety (90) 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.

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.

Jadual 3.3 JAS : Jumlah Permohonan Yang Diluluskan Bagi Tahun 2017
Table 3.3 DOE : Number Of Applications Approved In 2017

Jenis Permohonan Types of Applicant	Jumlah Permohonan No of Applicants	Jumlah Lulus No of applications approved	Peratusan Lulus Percentage approved
Baru New	4	1	25 %
Pembaharuan Renew	29	22	76%

Kursus Induksi Untuk Juruaudit Alam Sekitar

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

Pada tahun 2017, kursus induksi untuk Juruaudit Alam Sekitar telah diadakan pada 7 Mac hingga 10 Mac 2017 di 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.

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 2017, the induction course for Environmental Auditors was held on 7th March to 10th March, 2017 at Hotel Puri Pujangga, UKM, Bangi, Selangor.

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).

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 pihak Institut Alam Sekitar Malaysia (EiMAS) bagi mendapatkan jam kredit. Maklumat berkenaan program-program ini kemudiannya disebarkan kepada semua juruaudit berdaftar.

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 organiser 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.

Penilaian Awal Tapak bagi Projek Pembangunan

Penggerak projek dikehendaki untuk mengemukakan permohonan Penilaian Awal Tapak (PAT) kepada Jabatan Alam Sekitar untuk menentukan kesesuaian tapak projek yang dicadangkan (projek EIA dan bukan EIA).

Pada tahun 2017, sejumlah 11,644 permohonan telah diterima dan diproses di Jabatan Alam Sekitar Negeri. Negeri Johor mencatat permohonan PAT paling tinggi (2,465), diikuti oleh Selangor (2,073) dan lain-lain negeri seperti yang ditunjukkan di **Rajah 3.7.**

Selain dari penggerak projek, permohonan ini juga dirujuk kepada Jabatan Alam Sekitar oleh Kerajaan Negeri, Pihak Berkuasa Tempatan dan Pejabat Tanah serta agensi-agensi lain yang berkaitan.

Input teknikal telah diberikan kepada pihak berkuasa ini bagi memastikan aspek alam sekitar diberikan pertimbangan yang sewajarnya di dalam proses membuat keputusan.

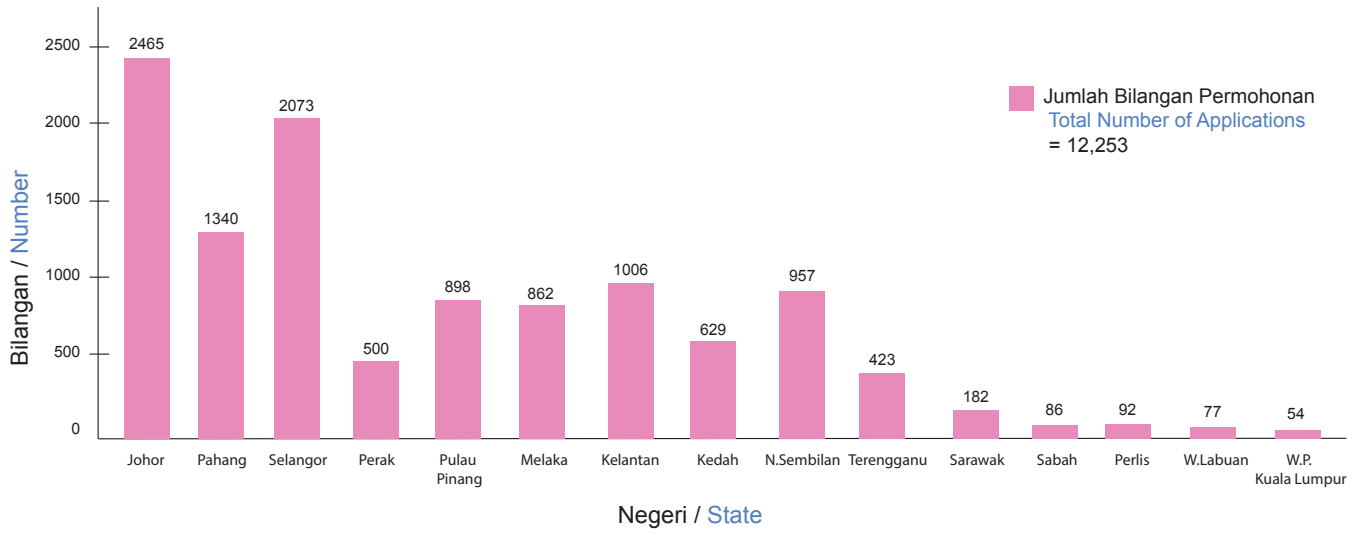
Site Suitability Evaluation for Development Projects

Project developers are required to submit Site Suitability Evaluation (PAT) application to the Department of Environment State Offices to determine the suitability of their proposed project sites for any proposed development projects (EIA and non-EIA projects).

In 2017, a total of 11,644 applications were received and processed by the Department of Environment State Offices. Johor recorded the highest number of applications (2,465), followed by Selangor ((2,073) and other states as shown in Figure 3.7.

Besides the project developers, these applications were also referred to the Department of Environment by the State Governments, Local Authorities and Land Offices, as well as other relevant agencies.

Technical environmental inputs were provided to the above agencies to ensure environmental aspects were given due consideration in the decision making process.



Rajah 3.7 JAS : Penilaian Awal Tapak Untuk Pembangunan Projek- Projek Pembangunan Negeri, 2017
Figure 3.7 DOE:Site Suitability Evaluation of Development Projects By State 2017

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) 1978 menghendaki supaya Kelulusan Bertulis diperolehi terlebih dahulu daripada Ketua Pengarah Alam Sekitar sebelum pemasangan alat pembakaran bahan api dan cerobong.

Pada tahun 2017, JAS telah menerima 137 pemberitahuan bertulis bagi pembinaan loji rawatan sisa kumbahan **(Rajah 3.8a)**, 271 pemberitahuan bertulis untuk sumber baru atau diubah pelepasan efluen perindustrian atau efluen bercampur **(Rajah 3.8b)** serta 1,050 permohonan bagi pemasangan alat kawalan pencemaran udara **(Rajah 3.9).**

Tambahan itu, Jabatan Alam Sekitar juga telah memproses sebanyak 2,026 permohonan bagi kelulusan bertulis untuk pemasangan alat pembakaran bahan api seperti dandang dan alat janakuasa **(Rajah 3.10).**

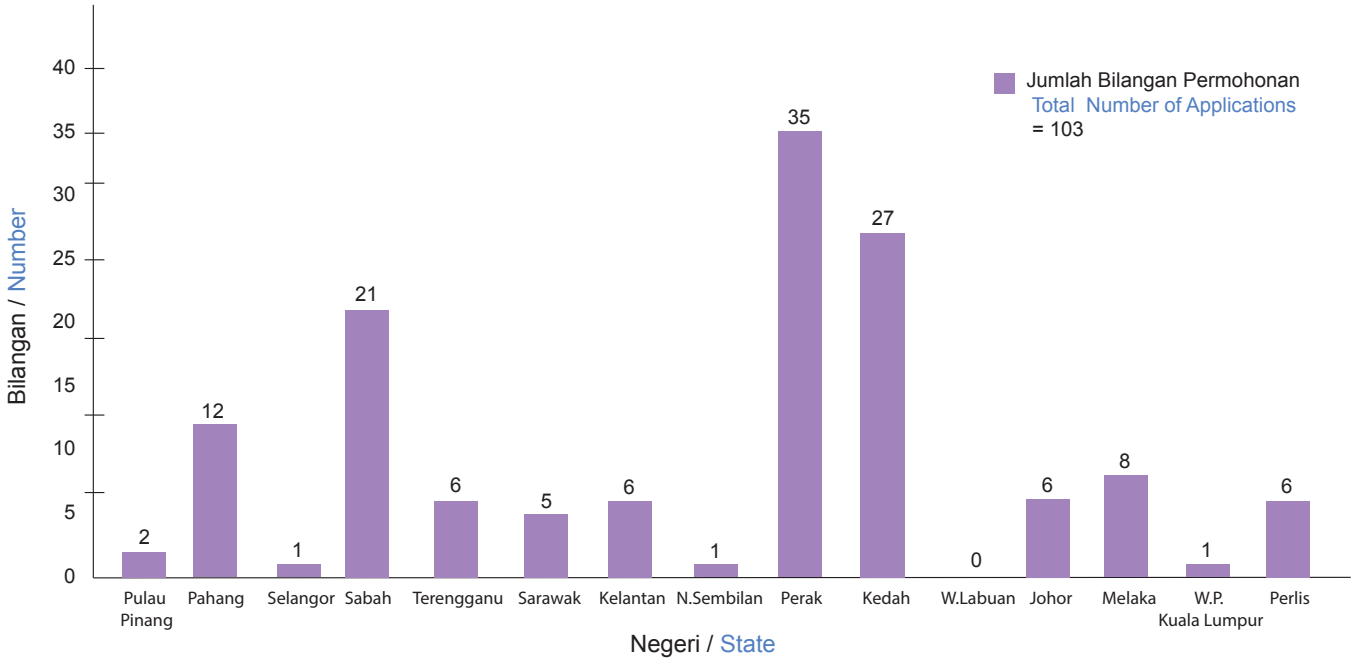
Written Notification and Approval

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.

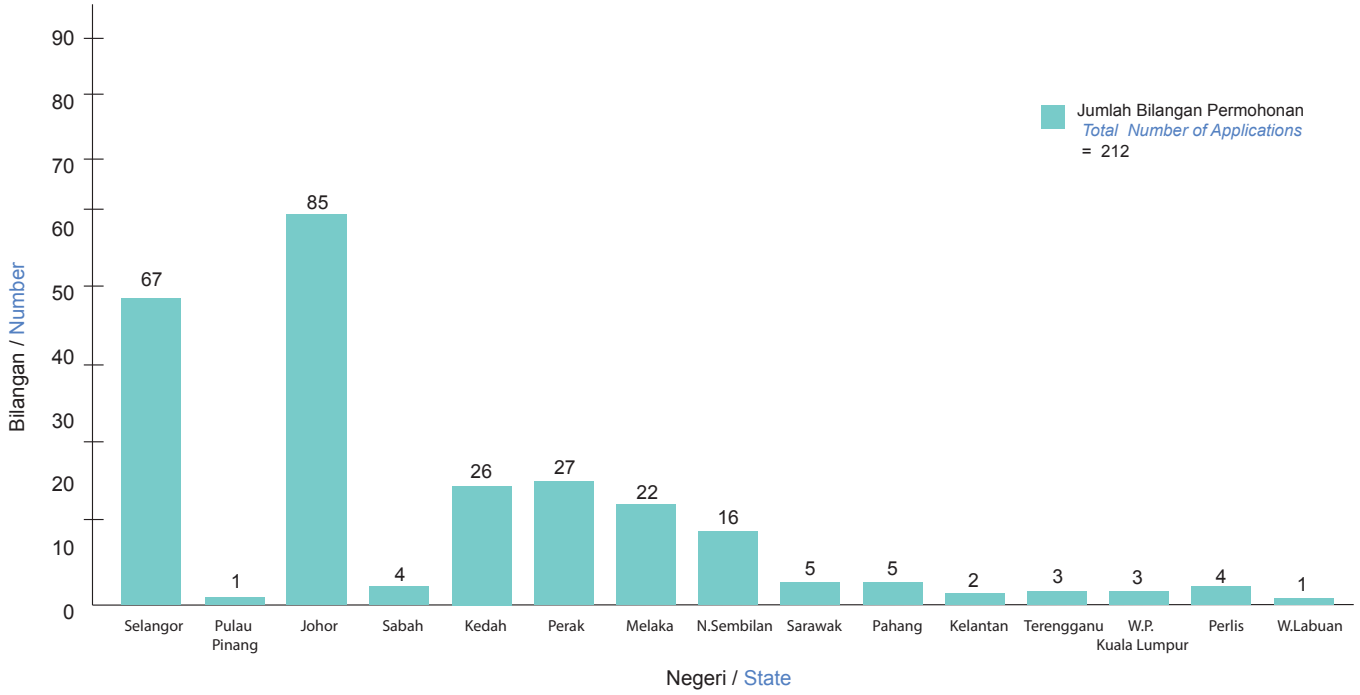
Whereas Regulations Environmental Quality (Clean Air) Regulations 1978 require the prior written approval is obtained from the Director General of Environment before the installation of fuel burning equipment and chimney.

In 2017, DOE has received 137 written notifications for the construction of effluent treatment plants **(Figure 3.8a)**, 271 written notifications for new or altered sources of discharges of industrial effluent or mixed effluents **(Figure 3.8b)** and 1,050 applications for installation of air pollution control equipment **(Figure 3.9).**

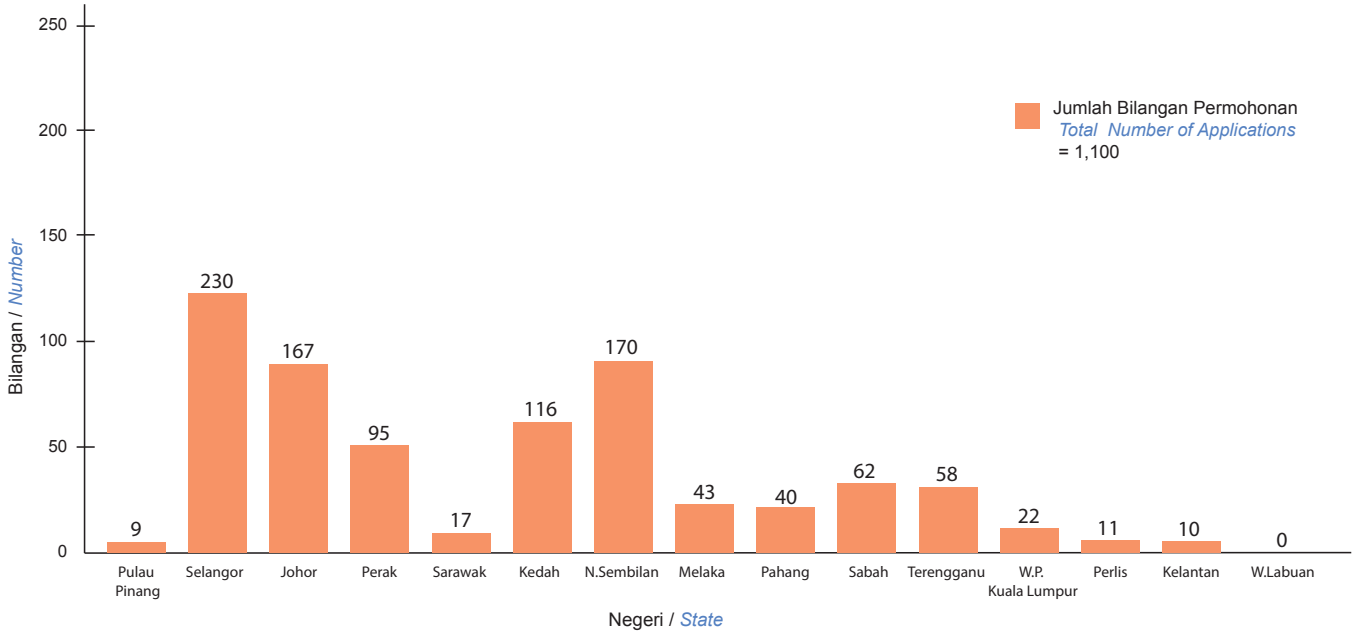
In addition, the Department of Environment has also processed a total of 2,026 applications for written approval for the installation of fuel burning equipment such as boilers and generator sets **(Figure 3.10).**



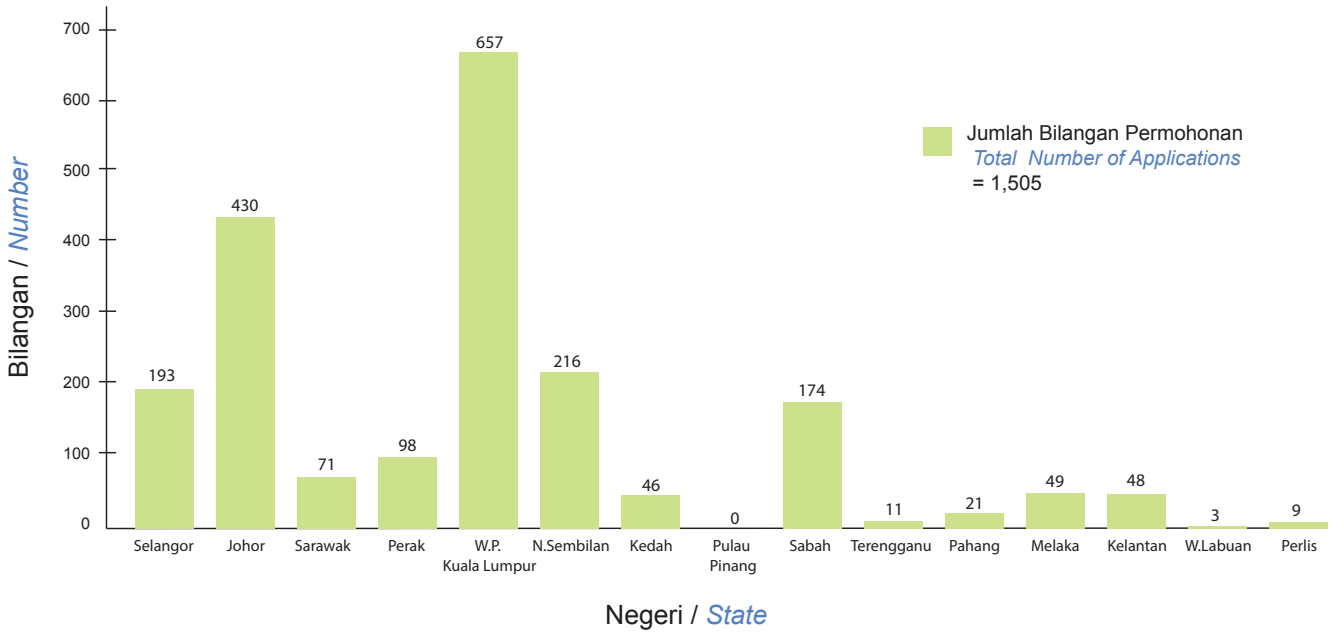
Rajah 3.8a JAS : Pemberitahuan Bertulis Bagi Punca baru Pembuangan atau Pelepasan Kumbahan, 2017
Figure 3.8a DOE : Notification For New Sources of Sewage Discharge or Release, 2017



Rajah 3.8b JAS : Pemberitahuan Bertulis Bagi Punca Baru atau Yang Diubah Efluen Perindustrian atau Efluen Bercampur,2017
Figure 3.8b DOE : Notification For New or Altered Sources of Discharge of Industrial Effluent Or Mixed Effluent,2017



Rajah 3.9 JAS : Permohonan Bagi Pemasangan Alat Kawalan Pencemaran Udara Mengikut Negeri, 2017
Figure 3.9 DOE : Application for Installation of Air Poluttion Control Equipment By State, 2017



Rajah 3.10 JAS : Permohonan Bagi Pemasangan Alat Pembakaran Bahan Api Mengikut Negeri, 2017
Figure 3.10 DOE : Application for Installation of Fuel Burning Equipment By State, 2017

Pembentukan Garis Panduan EIA

Pada tahun 2017, tiga (3) Garis Panduan telah dikeluarkan berikutan pindaan kepada Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan kepada Alam Sekeliling) 2015 pada 28 Ogos 2015 iaitu :-

i. *Environmental Impact Assessment Guidelines For Development in Hill and Slope*
ii. *Environmental Impact Assessment Guidelines For Development in Coastal and Marine Parks*
iii. *Environmental Impact Assessment Guidelines For Development in National and State Park*

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 pada masa yang sama akan memastikan bahawa pematuhan kendiri dilaksanakan dengan jayanya

Development of EIA-Related Guidelines

In 2017, three (3) Guidelines were produced following the amendments to the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 on 28th August 2015.

i. Environmental Impact Assessment Guidelines For Development in Hill and Slope
ii. Environmental Impact Assessment Guidelines For Development in Coastal and Marine Parks
iii. Environmental Impact Assessment Guidelines For Development in National and State Park

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 successfully

Environmental Essentials for Siting Of Industries In Malaysia (EESIM), 2017

Guidelines For Siting and Zoning of Industry And Residential Areas (2012) telah dikaji semula dan digantikan dengan satu panduan baru yang lebih komprehensif dan praktikal bagi mengarus perdana elemen alam sekitar khususnya dalam projek pembangunan industri bertajuk *Environmental Essentials for Siting of Industries in Malaysia* (EESIM) 2017. Ianya mengambilkira impak-impak alam sekitar yang perlu dikaji berdasarkan kepada jenis aktiviti pembangunan industri yang dicadangkan melalui keperluan aplikasi teknologi dan alat kawalan pencemaran yang berkesan dalam memastikan kesesuaian tapak cadangan pembangunan.

Panduan ini akan dapat membantu Kerajaan Persekutuan, Negeri, Pihak Berkuasa Tempatan Jabatan Alam Sekitar dalam merancang dan menentukan kawasan pembangunan dan penempatan industri yang dicadangkan.

Environmental Essentials for Siting of Industries In Malaysia, EESIM (2017)

Guidelines For Siting and Zoning of Industry And Residential Areas (2012) has been reviewed and replaced by a more comprehensive and practical guidance to mainstream environmental elements, particularly in the industrial development projects namely Environmental Essentials for Siting of Industries in Malaysia (EESIM), 2017 It takes into account the environmental impacts that need to be studied based on the types of industrial development activities proposed through the application of effective technology and pollution control tools to ensure the site suitability of the proposed development site.

This guidance will assist the Federal, State, Local Authorities and agencies under it and the Department of Environment in planning and determining the proposed development and placement areas of the industry.

Sehubungan itu, panduan ini perlu digunapakai dalam membuat penilaian tapak cadangan projek dengan menyelaras dan memperkenalkan keperluan aspek terkini alam sekitar ke arah pematuhan kendiri terpimpin atau *guided self* regulations selaras dengan konsep pembangunan mampan seperti berikut:-

i. Pemakaian *Best Available Technology (BAT) & Best Availaible Control Technology (BACT)* diambil kira dalam menentukan kesesuaian tapak projek dengan mengambil kira keserasian industri sedia ada bagi mengawal dan menangani impak pencemaran alam sekitar industri yang hendak dibangunkan;

ii. Konsep Teknologi Bersih atau *Cleaner Production* (CP) – diterapkan dalam panduan ini melalui beberapa elemen eko teknologi pilihan dalam pemilihan kepelbagaian teknologi mampan agar pencemaran alam sekitar dapat dihindari;

iii. Pengenalan kepada konsep *Eco- Industrial Park (EIP)* diambil kira dalam mempromosi pembangunan mampan sebagai kaedah baru dalam mempromosi kawasan pembangunan industri baru yang mesra alam dan terancang;dan

iv. Pemakaian panduan ini merupakan usaha jangkamasa panjang jabatan bagi menggalakan pematuhan kendiri termimpin atau *Guided Self Regulation (GSR)* di kalangan pihak berkuasa melulus, industri - industri utama dan penggerak projek. Pelaksanaan GSR ini melalui *Environmental Mainstreaming Tools (EMT)* dalam perancangan dan perlaksanaan projek.

Selaras dengan pemakaian EESIM ini, prosedur Penilaian Awal Tapak (PAT) dan penggunaan borang PAT adalah dimansuhkan.

In this regard, this guidance should be used in evaluating the project proposal site by coordinating and introducing the latest environmental aspect requirements towards guided self-regulation or guided self-regulation in line with the concept of sustainable development as follows:-

i. The Best Available Technology (BAT) and Best Availaible Control Technology (BACT) are taken into account in determining the suitability and the compatibility of the project with the existing industry to address and control the environmental pollution impact of industry to be developed;

ii. The Cleaner Production (CP) concept - is applied in this guidance through several ecological elements of choice in selecting sustainable technology diversity to avoid environmental pollution;

iii. Introduction to the concept of Eco-Industrial Park (EIP) is taken into account in promoting sustainable development as a new method in promoting eco-friendly and planned new industrial development areas;

iv. The use of this guidance is the department's long term effort to promote a guided self-regulation (GSR) among approval authorities, key industry players and project proponent. Implementation of this GSR through Environmental Mainstreaming Tools (EMT) in project planning and implementation.

In line with the adoption of EESIM, the Site Suitability Evaluation (PAT) procedure and the use of PAT form is abolished.

Guidelines On Land Distrubing Pollution Prevention And Mitigation Measures

Jabatan Alam Sekitar telah menerbitkan *Guidelines On Land Disturbing Pollution Prevention And Mitigation Measures* pada tahun 2017.

Garis panduan ini telah disediakan khusus untuk pemakaian bagi projek-projek pembangunan yang diklasifikasikan sebagai "Aktiviti Yang Ditetapkan" dibawah Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling), 2015 yang dikuatkuasakan dibawah Seksyen 34A AKAS 1974.

Di samping itu, garis panduan ini juga bertujuan untuk membimbing pihak-pihak berkepentingan mengikut peranan masing-masing bagi perancangan dan pengurusan isu berkenaan hakisan dan kelodakan dari tapak-tapak projek pembinaan, dengan mencegah, mengawal dan meminimumkan kesan-kesan dari aktiviti mengganggu tanah di tapak projek.

Walau bagaimanapun, ia juga boleh memberi manfaat kepada pihak lain yang mengambil berat terhadap isu-isu alam sekitar seperti orang awam, pertubuhan-pertubuhan bukan kerajaan (NGOs), ahli-ahli politik dan institusi pendidikan di Malaysia. Manfaat-manfaat garis panduan ini diringkaskan seperti berikut:

Pihak-pihak berkepentingan dalam sesuatu projek:

Meningkatkan pemahaman berkaitan isu-isu utama yang menyumbang kepada masalah hakisan dan kelodakan semasa aktiviti mengganggu tanah, dan menetapkan prosedur untuk diterimapakai oleh setiap pihak untuk mengawal dan menguruskan isu-isu ini :-

Agensi-agensi Kerajaan:

Mewujudkan kesepakatan bersama antara agensi – agensi melalui Strategi Lautan Biru Nasional untuk bekerjasama dalam menguruskan isu-isu berkaitan hakisan dan kelodakan di seluruh negara.

Institusi-institusi Pengajian Tinggi:

Menggalakkan inisiatif untuk memperbanyakkan penyelidikan & pembangunan (R&D) bertujuan menyelesaikan isu-isu berkaitan hakisan dan kelodakan dalam amalan-amalan pembinaan yang akan datang.

Guidelines On Land Distrubing Pollution Prevention And Mitigation Measures

Department of Environment (DOE) has published the Guidelines On Land Disturbing Pollution Prevention And Mitigation Measures in 2017.

This guidelines has been prepared primarily for the development projects that are classified as "Prescribed Activity" under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015 enforceable under Section 34A of EQA 1974.

In addition, this guideline is also intended to guide the stakeholders in their respective roles for the planning and managing issues concerning erosion and sedimentation from construction project sites, by preventing, controlling and minimizing the effects from the land disturbing activities on the project sites.

Nonetheless, it may also be beneficial to other parties who are concerned with environmental issues such as the general public, non-governmental organizations (NGOs), politicians and educational institutions in Malaysia. The benefits of this guidelines generally summarized as follows:

Stakeholders in a project:

Enhances the understanding of key issues contributing to erosion and sediment problems during land disturbing activities, and prescribes procedures to be adopted by each party to control & manage these issues;

Government Agencies:

Provides a common platform for agencies' use through National Blue Ocean Strategy for possible collaboration in dealing with erosion and sedimentation issues nationwide.

Higher Institutions:

Encourage initiatives to increase research & development (R&D) related to erosion and sediment issues in future construction practices;

Arena Politik:

Membantu dalam memberi penekanan semasa membuat dasar atau pengukuhan bertujuan isu hakisan dan kelodakan nasional;

NGOs:

Menggalakkan kerjasama yang lebih luas dengan pihak berkepentingan projek dalam perlindungan alam sekitar serta keuntungan pihak yang menerima kesan;

Institusi Pendidikan:

Meningkatkan kesedaran alam sekitar secara umum dikalangan generasi muda;

Orang Awam:

Meningkatkan kesedaran orang awam mengenai impak terhadap aktiviti kerja tanah yang tidak diurus dengan baik.

Political Arena:

Assists in emphasizing of policy making or strengthening to address erosion and sediment issues nationally;

NGOs:

Encourages greater collaboration with project stakeholders in environmental protection as well as the interests of affected parties;

Educational Institutions:

Raising the general environmental awareness among younger generation;

General Public:

Raising public awareness about the impact on poorly managed land disturbing activities.

BAB 4
CHAPTER 4

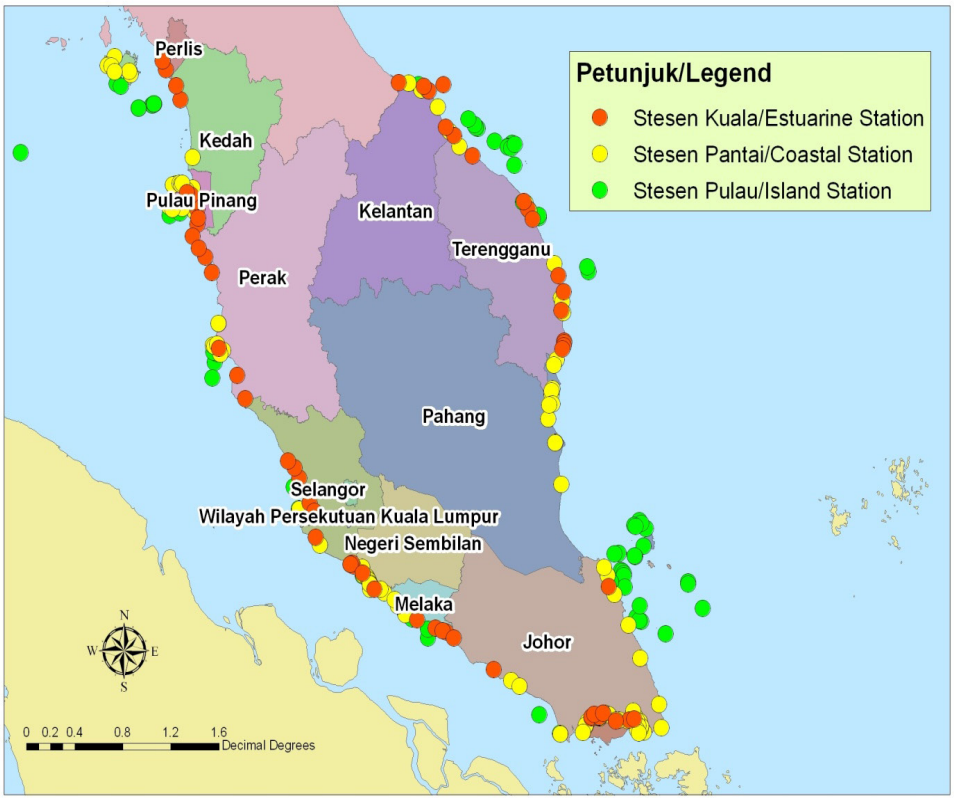
PENGAWASAN KUALITI AIR MARIN KEBANGSAAN
MARINE WATER QUALITY MONITORING

Program Pengawasan Kualiti Air Marin Kebangsaan telah dimulakan di Semenanjung Malaysia pada tahun 1978 dan diperluaskan 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 kegunaan berfaedahnya seperti kawasan rekreasi, perikanan dan taman-taman laut.

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 established at estuaries and coastal areas to monitor marine water quality status with respect to their beneficial uses such as recreation, fishing and marine parks.

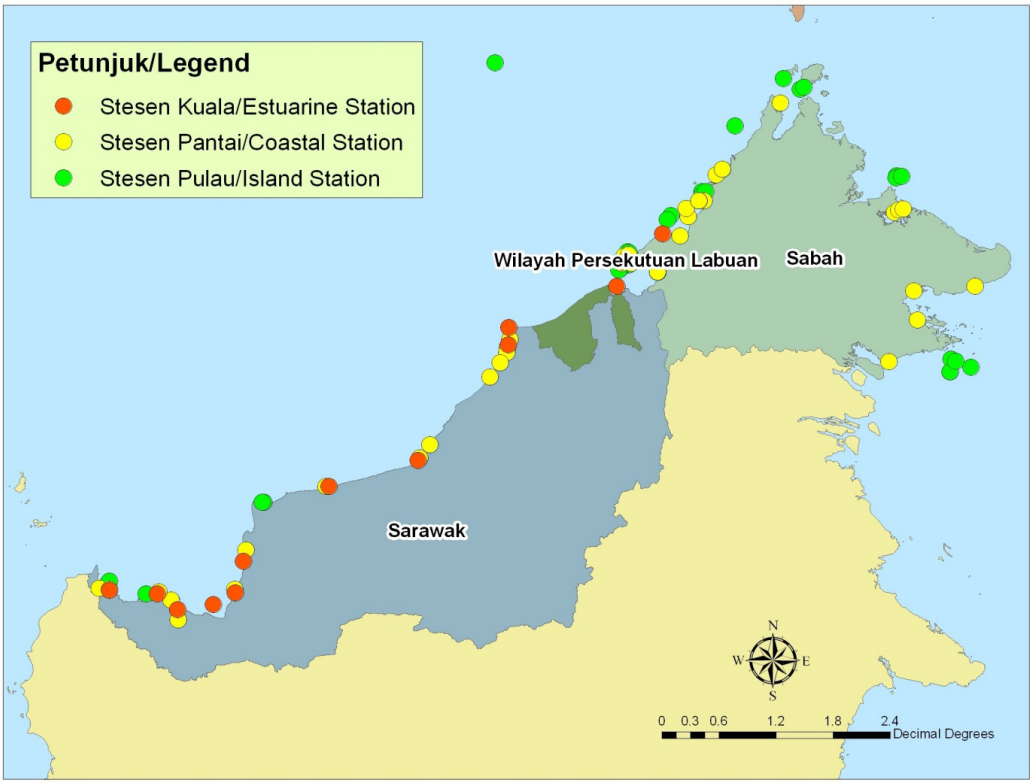
Pada tahun 2017, terdapat 276 stesen pengawasan di seluruh Malaysia termasuklah Perlis, (2) stesen; Kedah, (13) stesen; Pulau Pinang, (24) stesen; Perak, (14) stesen; Selangor, (16) stesen; Negeri Sembilan, (16) stesen; Melaka, (17) stesen; Johor, (38) stesen; Pahang, (27) stesen; Terengganu, (29) stesen; Kelantan, (12) stesen; Sarawak, (37) stesen ; Sabah, (26) stesen; dan W.P Labuan, (5) stesen **(Peta 4.1 (a),4.1 (b)** dan **Jadual 4.1).**

In 2017, a total of 276 monitoring stations were 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, (38) 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), 4.1(b)** and **Table 4.1).**



Peta 4.1 (a) Semenanjung Malaysia : Taburan Stesen Pemantauan Kualiti Air Marin, 2017

Map 4.1 (a) Peninsular Malaysia: Distribution of Marine Water Quality Stations, 2017



Peta 4.1 (b) Sabah dan Sarawak : Taburan Stesen Pengawasan Kualiti Air Marin, 2017

Map 4.1 (b) Sabah and Sarawak : Distribution of Marine Water Quality Stations, 2017

Jadual 4.1 JAS: Stesen Pemantauan Kualiti Air Marin Kebangsaan, 2017

Table 4.1 DOE: Marine Water Quality Monitoring Stations, 2017

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

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
Kedah	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
Pulau Pinang	2	Pantai Coastal	Gertak Sanggul	5201919	MMPC001	5.277320	100.194000
			Kawasan Perindustrian Bayan Lepas 1	5303932	MMPC002	5.309510	100.301000

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Pulau Pinang	15	Pantai Coastal	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
Perak	5	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

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Perak	3	Pantai Coastal	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
Selangor	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 Sembilan	2	Kuala Estuary	Kuala Sungai Linggi	2319901	MMNE001	2.391010	101.973000
			Kuala Sungai Lukut	2517910	MMNE002	2.578020	101.788000
Negeri Sembilan	5	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

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Negeri Sembilan	9	Pantai Coastal	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
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

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Johor	9	Kuala Estuary	Kuala Sungai Melayu	1437946	MMJS001	1.454252	103.699417
			Kuala Sungai Skudai	1437922	MMJS002	1.465049	103.721794
			Kuala Sungai Tebrau	1438943	MMJS003	1.482222	103.796667
			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
Johor	17	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
			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

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Johor	12	Pantai Coastal	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 Nenasi*	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 STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Pahang	9	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

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Pahang	13	Pantai Coastal	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
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

NEGERI STATE	BIL STESEN NO OF STATION	KLASIFIKASI STESEN STATION CLASSIFICATION	KAWASAN AREA	NOMBOR STESEN STATION NUMBER	NOMBOR STESEN BARU NEW STATION NUMBER	LOKASI LOCATION	
						LATITUD LATITUDE	LONGITUD LONGITUDE
Terengganu	16	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
			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
Kelantan	4	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

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
Kelantan	2	Pantai Coastal	Pantai Bisikan Bayu	5825905	MMDC005	5.862590	102.518000
			Pantai Melawi*	NA	MMDC006	5.994650	102.441000
Sarawak	14	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
			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
Sarawak	10	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

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	13	Pantai Coastal	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
			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
Sabah	11	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

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	13	Pantai Coastal	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
			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 : 88

Pantai/ Coastal: 188

Jumlah/ Total : 276

PENGAWASAN KUALITI AIR MARIN PULAU-PULAU
ISLAND MARINE WATER QUALITY MONITORING

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 2017, program ini telah dilaksanakan di sekitar 80 buah pulau terpilih dan melibatkan 95 stesen pengawasan. Pulau-pulau ini di kelaskan mengikut empat (4) kategori iaitu pulau pembangunan (3), pulau peranginan (30), pulau taman laut (29) dan pulau yang dilindungi (13) (**Jadual 4.2**). Kekerapan persampelan bagi pulau pembangunan adalah sebanyak enam (6) kali setahun manakala bagi pulau yang lainnya adalah sebanyak empat (4) kali setahun.

Pengukuran parameter-parameter fizikal kualiti air marin dibuat secara in-situ seperti suhu, pH, konduktiviti, kemasinan, oksigen terlarut dan kekeruhan manakala dua puluh tiga (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 Tributytin (TBT) serta Triphenyltin (TPT) (**Jadual 4.3**). Percontohan bebola tar di pantai juga dilaksanakan.

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, The Island Marine Water Quality Monitoring Programme was established in July 1998. In 2017, the programme was conducted at 80 selected islands covering 95 monitoring stations. The islands are classified into four (4) categories; development islands (3), resort islands (30), marine park islands (29) and protected island (13) (**Table 4.2**). The sampling frequency of development island was six (6) times per year, while the frequency for the others island categories was four (4) times per year.

Marine water quality monitoring includes measurement of in-situ parameters such as temperature, pH, conductivity, salinity, dissolved oxygen and turbidity. Meanwhile, laboratory analysis involves twenty three (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 4.3**). Tarball sampling on beaches was also conducted.

Jadual 4.2 JAS: Stesen-Stesen Pemantauan Kualiti Air Marin Pulau, 2017
Table 4.2 DOE: Island Water Quality Monitoring Stations, 2017

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

NEGERI STATE	BIL. PULAU NO. OF ISLAND	BIL. STESEN NO. OF STATION	PULAU ISLAND	NO. STESEN STATION NO	ID STESEN BARU NEW STATION ID	KATEGORI CATEGORY	LOKASI LOCATION	
							LATITUD LATITUDE	LONGITUD LONGITUDE
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
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

NEGERI STATE	BIL. PULAU NO. OF ISLAND	BIL. STESEN NO. OF STATION	PULAU ISLAND	NO. STESEN STATION NO	ID STESEN BARU NEW STATION ID	KATEGORI CATEGORY	LOKASI LOCATION	
							LATITUD LATITUDE	LONGITUD LONGITUDE
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
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
		1	Kapas	7TM09	MMTM010	M	5.216970	103.26000
KELANTAN	2	1	Panjang	7DP01	MMDP001	P	6.207000	102.25800
		1	Kundur	7DP02	MMDP002	P	6.189460	102.29200
SARAWAK	3	1	Satang	7QP01	MMQP001	P	1.777660	110.16500
		1	Talang-Talang Kecil	7QP02	MMQP002	P	1.893470	109.76700
		1	Talang-Talang Besar	7QP03	MMQP003	P	1.911030	109.77700

NEGERI STATE	BIL. PULAU NO. OF ISLAND	BIL. STESEN NO. OF STATION	PULAU ISLAND	NO. STESEN STATION NO	ID STESEN BARU NEW STATION ID	KATEGORI CATEGORY	LOKASI LOCATION	
							LATITUD LATITUDE	LONGITUD LONGITUDE
SABAH	16	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
		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
			LubukTemiang	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 applicable)

Jadual 4.3 JAS : Parameter Kualiti Air Marin, 2017
Table 4.3 DOE: Marine Water Quality Parameters, 2017

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
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	TPC	µg/l
18	Tributiltin/ Tributyltin	TBT	µg/l
19	Total Coliform	TC	MPN/100ml
20	Faecal Coliform	FC	MPN/100ml
21	Escherichia coli	E.coli	MPN/100m
22	Entrococci	-	MPN/100ml
23	Polycylic Aromatic Hydrocarbons	PAHs	µg/l

PENGAWASAN KUALITI AIR DARATAN (SUNGAI)
SURFACE WATER (RIVER) QUALITY MONITORING

Pengawasan Kualiti Air 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 sungai-sungai dan mengesan perubahannya dari semasa ke semasa.

Pada tahun 2017, rangkaian stesen pengawasan kualiti air sungai JAS adalah terdiri daripada 836 stesen yang terletak di 477 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 biologikal seperti di **Jadual 4.6**.

River Water Quality Monitoring

The Department of Environment (DOE) has implemented River Water Quality Monitoring Program since 1978 and comprehensively starting 1995 to determine the river water quality status and detect changes over time.

In 2017, DOE's river water quality monitoring network comprised of 836 manual stations which are located at 477 rivers in Malaysia as shown in **Table 4.4**. Fifty five (55) stations from the network 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 JAS : Senarai Lembangan Sungai dan Sungai-Sungai Yang Dipantau, 2017
Table 4.4 DOE : List of the Catchments and Rivers Monitored, 2017

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
Perlis	1	6	6	01	Perlis	6	Sg. Jarum	1
							Sg. Jernih	1
							Sg. Ngulang	1
							Sg. Pelarit	1
							Sg. Perlis	1
							Sg. Wang Kelian	1
Kedah	4	14	16	01PLA	Kisap	1	Sg. Kisap	1
				01PLC	Ulu Melaka	2	Sg. Petang	1
							Sg. Ulu Melaka	1
				03	Kedah	8	Sg. Janing	1
							Sg. Kedah	1
							Sg. Padang Terap	3
							Sg. Pedu	1
							Sg. Pendang	1
							Sg. Tekai	1
				04	Merbok	5	Sg. Bongkok	1
							Sg. Merbok	1
							Sg. Petani	1
							Sg. Tok Pawang	1
							Sg. Tupah	1
Kedah/ Pulau Pinang	1	7	11	05	Muda	11	Sg. Chepir	1
							Sg. Jerung	1
							Sg. Karangan	1
							Sg. Ketil	2
							Sg. Muda	4
							Sg. Pegang	1
							Sg. Sedim	1
Pulau Pinang	6	22	37	06PP	Pinang	9	Sg. Air Itam	5
							Sg. Air Terjun	1
							Sg. Dondang	1
							Sg. Jelutong	1
							Sg. Pinang	1
				06J	Juru	8	Sg. Juru	2
							Sg. Kilang Ubi	4
							Sg. Pasir	1
							Sg. Rambai	1
				06K	Kluang	3	Sg. Ara	2
							Sg. Relau	1
				06P	Perai	11	Sg. Jarak	3
							Sg. Keladi	1
							Sg. Kereh	2
							Sg. Kulim	2

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
							Sg. Perai	2
							Sg. Pertama	1
				06T	Bayan Lepas	3	Sg. Bayan Lepas	1
							Sg. Tiram	2
				07	Jawi	3	Sg. Jawi	1
							Sg. Junjong	1
							Sg. Machang Bubok	1
Pulau Pinang/ Perak	1	3	7	08	Kerian	7	Sg. Kechil	1
							Sg. Kerian	4
							Sg. Selama	2
Perak	6	38	72	12	Raja Hitam	5	Sg. Manjong	2
							Sg. Nyior	1
							Sg. Raja Hitam	2
				12W	Wangi	2	Sg. Deralik	1
							Sg. Wangi	1
				09	Kurau	6	Sg. Ara	2
							Sg. Kurau	4
				10	Sepetang	10	Sg. Batu Tegoh	3
							Sg. Jana	1
							Sg. Limau	1
							Sg. Sepetang	2
							Sg. Temerloh	2
							Sg. Trong	1
				11	Bruas	5	Sg. Bruas	3
							Sg. Dandang	1
							Sg. Rotan	1
				13	Perak	44	Sg. Batang Padang	3
							Sg. Bidor	3
							Sg. Chenderiang	1
							Sg. Chepor	1
							Sg. Kampar	2
							Sg. Kangsar	1
							Sg. Kepayang	2
							Sg. Kerdah	1
							Sg. Kinjang	1
							Sg. Kinta	6
							Sg. Klah	1
							Sg. Kuang	1
							Sg. Nyamok	1
							Sg. Pari	1
							Sg. Pelus	2
							Sg. Perak	8
							Sg. Pinji	2
							Sg. Raia	2
							Sg. Seluang	1
							Sg. Serokai	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
							Sg. Sungkai	2
							Sg. Tumboh	1
Perak/ Selangor	1	4	8	14	Bernam	8	Sg. Bernam	4
							Sg. Inki	1
							Sg. Slim	2
							Sg. Trolak	1
Selangor	5	17	33	17	Buloh	4	Sg. Buloh	4
				19	Langat	15	Sg. Anak Chuau	1
							Sg. Batang Nilai	1
							Sg. Chuau	2
							Sg. Jijan	1
							Sg. Langat	7
							Sg. Lui	1
							Sg. Pajam	1
							Sg. Semenyih	1
				20	Sepang	2	Sg. Sepang	2
				15	Tengi	3	Sg. Tengi	3
				16	Selangor	9	Sg. Batang Kali	1
							Sg. Kanching	1
							Sg. Kerling	1
							Sg. Selangor	4
							Sg. Sembah	1
							Sg. Serendah	1
Selangor/ WPKL	1	18	38	18	Klang	38	Sg. Batu	4
							Sg. Gombak	3
							Sg. Jinjang	3
							Sg. Klang	8
							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. Damansara	2
							Sg. Kuyoh	1
							Sg. Rasau	1
							Sg. Penchala	1
Negeri Sembilan	1	9	14	21	Linggi	14	Sg. Batang Penar	1
							Sg. Chembong	1
							Sg. Kepayong	1
							Sg. Kundur Besar	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
							Sg. Linggi	5
							Sg. Pedas	1
							Sg. Rembau	2
							Sg. Simin	1
							Sg. Siput	1
Melaka	5	13	24	21SM	Seri Melaka	1	Sg. Seri Melaka	1
				22	Melaka	12	Sg. Btg.Melaka	2
							Sg. Durian Tunggal	1
							Sg. Kemunting	1
							Sg. Dusun/Keru	1
							Sg. Melaka	5
							Sg. Rembia	1
							Sg. Tampin	1
				24	Kesang	5	Sg. Chohong	2
							Sg. Kesang	3
				24A	Merlimau	2	Sg. Merlimau	2
				23	Duyong	4	Sg. Duyong	3
							Sg. Gapam	1
Johor/ Negeri Sembilan	1	8	15	25	Muar	15	Sg. Air Panas	1
							Sg. Gemencheh	1
							Sg. Juasseh	1
							Sg. Labis	1
							Sg. Meda	1
							Sg. Muar	8
							Sg. Sarang Buaya	1
							Sg. Segamat	1
Johor	22	91	157	26	Batu Pahat	20	Sg. Amran	1
							Sg. Bantang	1
							Sg. Batu Pahat	1
							Sg. Bekok	5
							Sg. Berlian	1
							Sg. Chaah	1
							Sg. Lenik	1
							Sg. Merek	1
							Sg. Merpo	1
							Sg. Semberong	2
							Sg. Simpang Kanan	2
							Sg. Simpang Kiri	3
				27A	Air Baloi	3	Sg. Air Baloi	3
				28	Segget	5	Sg. Segget	5
				28D	Tebrau	10	Sg. Bala	1
							Sg. Pandan	1
							Sg. Plentong	1
							Sg. Sebulung	1
							Sg. Sengkuang	1
							Sg. Tampoi	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
							Sg. Tebrau	4
				28F	Danga	2	Sg. Danga	2
				28G	Rambah	2	Sg. Rambah	2
				29B	Kaw. Pasir Gudang	5	Sg. Buluh	1
							Sg. Latoh	1
							Sg. Masai	1
							Sg. Perembi	1
							Sg. Tukang Batu	1
				27B	Benut	7	Sg. Benut	4
							Sg. Parit Hj. Yassin	1
					ص		Sg. Pinggan	1
							Sg. Ulu Benut	1
				28A	Pontian Besar	7	Sg. Air Hitam	1
							Sg. Ayer Merah	1
							Sg. Pontian Besar	5
				28B	Pontian Kecil	2	Sg. Pontian Kecil	2
				28C	Skudai	11	Sg. Melana	2
							Sg. Skudai	9
				28E	Kempas	2	Sg. Kempas	2
				29C	Sanglang	1	Sg. Sanglang	1
				29D	Pulai	3	Sg. Pulai	2
							Sg. Ulu Choh	1
				31C	Kim-Kim	2	Sg. Kim-Kim	2
				29	Johor	34	Sg. Anak Sg. Sayong	1
							Sg. Belitong	1
							Sg. Bukit Besar	1
							Sg. Chemangar	1
							Sg. Johor	4
							Sg. Layang	1
							Sg. Layau Kiri	1
							Sg. Lebam	1
							Sg. Linggiu	1
							Sg. Panti	1
							Sg. Papan	1
							Sg. Pelepah	2
							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. Telor	1
							Sg. Temoh	1
							Sg. Tiram	4

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
				30A	Sedili Besar	9	Sg. Ambat	1
							Sg. Dohol	1
							Sg. Pasir Panjang	1
							Sg. Sedili Besar	5
							Sg. Temubor Kanan	1
				30B	Sedili Kecil	5	Sg. Anak Sedili Kecil	1
							Sg. Bahan	2
							Sg. Sedili Kecil	2
				30C	Paloi	1	Sg. Paloi	1
				31A	Mersing	2	Sg. Mersing	2
				31B	Jemaluang	2	Sg. Jemaluang	2
				32	Endau	22	Sg. Endau	3
							Sg. Jasin	1
							Sg. Jebong	1
							Sg. Kahang	1
							Sg. Lenggor	1
							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
Pahang	9	63	99	32AE	Anak Endau	2	Sg. Anak Endau	2
				33	Rompin	9	Sg. Aur	1
							Sg. Keratong	2
							Sg. Pontian	1
							Sg. Pukin	1
							Sg. Rompin	4
				34M	Merchong	1	Sg. Merchong	1
				35P	Pahang	67	Sg. Bentong	1
							Sg. Benus	2
							Sg. Bera	2
							Sg. Berkapor	1
							Sg. Bertam	1
							Sg. Burung	1
							Sg. Chini	1
							Sg. Habu	1
							Sg. Jelai	2
							Sg. Jempol	2
							Sg. Jengka	2
							Sg. Kelau	1
							Sg. Kertam	1
							Sg. Koyan	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
							Sg. Kundang	1
							Sg. Lenggok	1
							Sg. Lepar	3
							Sg. Lipis	3
							Sg. Luit	1
							Sg. Maran	1
							Sg. Mentiga	1
							Sg. Pahang	8
							Sg. Perting	1
							Sg. Ringlet	1
							Sg. Semantan	4
							Sg. Serting	2
							Sg. T. Paya Bungor	1
							Sg. Tahan	1
							Sg. Tanglir	1
							Sg. Tasik Bera	1
							Sg. Tasik Chini	1
							Sg. Tekal	1
							Sg. Tekam	2
							Sg. Telang	1
							Sg. Telom	2
							Sg. Tembeling	1
							Sg. Teranum	1
							Sg. Teras	1
							Sg. Teris	3
							Sg. Terla	1
							Sg. Triang	2
							Sg. Tringkap	1
				34B	Bebar	4	Sg. Bebar	1
							Sg. Merba	1
							Sg. Serai	2
				36	Kuantan	11	Sg. Belat	1
							Sg. Charu	1
							Sg. Kenau	1
							Sg. Kuantan	5
							Sg. Pandan	1
							Sg. Riau	1
							Sg. Talam	1
				37	Balok	3	Sg. Balok	2
							Sg. Panjang	1
				37A	Cherating	1	Sg. Cherating	1
				37B	Tonggok	1	Sg. Tonggok	1
Terengganu	13	24	35	38	Kemaman	4	Sg. Cherul	1
							Sg. Kemaman	2
							Sg. Ransan	1
				39K	Kertih	1	Sg. Kertih	1
				40	Paka	2	Sg. Paka	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
							Sg. Rasau	1
				41	Dungun	4	Sg. Dungun	4
				42M	Marang	1	Sg. Marang	1
				43	Terengganu	7	Sg. Berang	1
							Sg. Nerus	1
							Sg. Pueh	1
							Sg. Telemong	1
							Sg. Terengganu	3
				44	Setiu	4	Sg. Chalok	2
							Sg. Setiu	2
				46	Besut	2	Sg. Besut	2
				47	Kluang	1	Sg. Kluang	1
				39C	Chukai	4	Sg. Bungkus	1
							Sg. Chukai	1
							Sg. Ibok	1
							Sg. Ruang	1
				42I	Ibai	3	Sg. Ibai	3
				42L	Merchang	1	Sg. Merchang	1
				45	Merang	1	Sg. Merang	1
Kelantan	5	24	52	47K	Kemasin	4	Sg. Kemasin	2
							Sg. Semerak	2
				48	Kelantan	33	Sg. Belatop	2
							Sg. Ber	1
							Sg. Berok	3
							Sg. Betis	1
							Sg. Galas	5
							Sg. Kelantan	3
							Sg. Kerilla	1
							Sg. Lebir	3
							Sg. Nal	2
							Sg. Nenggiri	3
							Sg. Pergau	6
							Sg. Relai	1
							Sg. Sokor	1
							Sg. Tuang	1
				49	Golok	6	Sg. Golok	5
							Sg. Lanas	1
				48C	Pengkalan Chepa	6	Sg. Alor B	1
							Sg. Alor Lintah	1
							Sg. Keladi	1
							Sg. Pengkalan Chepa	2
							Sg. Raja Gali	1
				48D	Pengkalan Datu	3	Sg. Pengkalan Datu	3
Sarawak	22	54	104	50	Kayan	3	Sg. Kayan	3
				50S	Semunsam	1	Sg. Semunsam	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
				51	Sarawak	15	Sg. Kuap	1
							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
				59	Balingian	2	Sg. Balingian	2
				62	Similajau	2	Sg. Similajau	2
				64	Niah	3	Sg. Niah	2
							Sg. Sekaloh	1
				68	Limbang	5	Sg. Limbang	5
				69	Trusan	1	Sg. Trusan	1
				70	Lawas	3	Sg. Lawas	3
				52	Sadong	6	Sg. Karangan	2
							Sg. Sadong	4
				53	Lupar	8	Sg. Ai	2
							Sg. Lupar	3
							Sg. Sekerang	1
							Sg. Seterap	1
							Sg. Undup	1
				54	Saribas	3	Sg. Layar	2
							Sg. Saribas	1
				55	Kerian	3	Sg. Kerian	2
							Sg. Seblak	1
				56	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
				57	Oya	3	Sg. Oya	3
				58	Mukah	4	Sg. Mukah	4
				60	Tatau	1	Sg. Tatau	1
				61	Kemena	4	Sg. Kemena	3
							Sg. Sibiu	1
				63	Suai	1	Sg. Suai	1
				65	Sibuti	6	Sg. Kabuloh	2
							Sg. Kejapil	1
							Sg. Satap	1
							Sg. Sibuti	2
				66	Miri	6	Sg. Adong	1
							Sg. Dalam	1

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
							Sg. Lutong	1
							Sg. Miri	2
							Sg. Padang Liku	1
				67	Baram	5	Sg. Baram	4
							Sg. Tutuh	1
Sabah	36	62	108	71	Menggalong	2	Sg. Menggalong	2
				71A	Lakutan	1	Sg. Lakutan	1
				71B	Lingkungan	2	Sg. Bukau	1
							Sg. Lingkungan	1
				72	Padas	10	Sg. Bunsit	1
							Sg. Liawan	1
							Sg. Padas	3
							Sg. Pangatan	1
							Sg. Pegalan	3
							Sg. Tandulu	1
				73	Membakut	1	Sg. Membakut	1
				74	Kimanis	1	Sg. Kimanis	1
				74A	Bongawan	1	Sg. Bongawan	1
				75	Papar	3	Sg. Papar	3
				76	Moyog	4	Sg. Moyog	4
				77	Tuaran	5	Sg. Damit	2
							Sg. Song Sai	1
							Sg. Tuaran	2
				78	Kedamaian	4	Sg. Kedamaian	1
							Sg. Tempasuk	2
							Sg. Wariu	1
				78T	Tenghilan	1	Sg. Tenghilan	1
				79	Bingkongan	6	Sg. Bandau	1
							Sg. Bingkongan	2
							Sg. Menggaris	2
							Sg. Tandek	1
				80	Bengkoka	2	Sg. Bengkoka	2
				82	Paitan	1	Sg. Paitan	1
				83	Sugut	6	Sg. Bongkud	1
							Sg. Lohan	1
							Sg. Merali	1
							Sg. Sugut	3
				84	Labok	7	Sg. Kinipir	2
							Sg. Labok	1
							Sg. Liwagu	2
							Sg. Maliau	1
							Sg. Tungud	1
				84A	Sapi	4	Sg. Sapi	3
							Sg. Sualong	1
				85	Mounad	2	Sg. Mounad	2
				87	Segama	3	Sg. Segama	3
				88	Tungku	2	Sg. Tungku	2

Negeri State	Jumlah Lembangan Total River Basin	Jumlah Sungai Diawasi Total River Monitored	Jumlah Stesen Total Stations	Kod WKA Code QR	Lembangan Sungai River Basin	Bilangan Stesen No. of Stations	Sungai Diawasi River Monitored	Bilangan Stesen No. of Stations
				88A	Silabukan	2	Sg. Silabukan	2
				89	Tingkayu	2	Sg. Tingkayu	2
				91	Tawau	4	Sg. Tawau	4
				91A	Apas	1	Sg. Apas	1
				91B	Balung	1	Sg. Balung	1
				92	Merotai	3	Sg. Merotai	3
				93	Umas-Umas	1	Sg. Umas-Umas	1
				94	Brantian	1	Sg. Brantian	1
				95	Kalabakan	3	Sg. Kalabakan	3
				76A	Sembulan	2	Sg. Sembulan	2
				76B	Likas	7	Sg. Inanam	3
							Sg. Likas	2
							Sg. Menggatal	2
				76C	Telipok	2	Sg. Telipok	2
				85A	Segaliud	2	Sg. Segaliud	2
				86	Kinabatangan	6	Sg. Karamuak	1
							Sg. Kinabatangan	3
							Sg. Koyah	1
							Sg. Menanggul	1
				90	Kalumpang	3	Sg. Kalumpang	3
JUMLAH TOTAL	**140**	**477**	**836**	**140**	**140**	**836**	**477**	**836**

Jadual 4.5 JAS : Senarai Stesen Pemantauan Muka Sauk Loji Rawatan Air
Table 4.5 DOE: 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 sauk Loji Rawatan Air Arau Fasa IV
				2PS14	Muka sauk 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
Pulau Pinang	Pinang	06PP	Sg. Satu	2PG12	Batu Feringgi
Perak	Kurau	9	Sg. Air Hitam	2KU07	Muka sauk Loji Rawatan Air Jelai
	Sepetang	10	Sg. Batu Tegoh	2SP18	Muka sauk Loji Rawatan Air Bukit Larut
	Perak	13	Sg. Sauk	2PK61	Muka sauk Loji Rawatan Air Sauk
			Sg. Manong	2PK62	Muka sauk Loji Rawatan Air Manong
			Sg. Woh	2PK63	Muka sauk Loji Rawatan Air Kuala Woh
			Sg. Tesong	2PK64	Muka sauk Loji Rawatan Air Sg. Klah
Selangor/ Perak	Bernam		Sg. Trolak	2BM14	Muka sauk Loji Rawatan Air Trolak Timur
			Sg. Gelinting	2BM15	Muka sauk Loji Rawatan Air Ulu Slim
Selangor	Klang	18	Sg. Gombak	1K53	Muka sauk Loji Rawatan Air Gombak
	Langat	19	Sg. Semenyih	1L09	Muka sauk Loji Rawatan Air Semenyih
			Sg. Batang Labu	1L26	Muka sauk Loji Rawatan Air Salak Tinggi
Melaka	Kesang	24	Sg. Chin-Chin	1KA08	Muka sauk Loji Rawatan Air Chin-chin
Johor	Muar	25	Sg. Jelai	1MN23	Muka sauk Loji Rawatan Air Dangi
			Sg. Muar	3MR38	Muka sauk Loji Rawatan Air Gombang
			Sg. Jementah	3MR39	Muka sauk 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

Negeri State	Lembangan Sungai River Basin	Kod WKA Code WQR	Sungai River	ID Stesen Station ID	Lokasi Muka Sauk Water Intake Location
Pahang	Bertam	35P	Sg. Terla	2CH14	Muka sauk Loji Rawatan Air Kuala Terla (WTSI)
			Sg. Bertam	2CH15	Muka sauk Loji Rawatan Air Habu (WWB)
			Sg. Ulong	2CH16	Brinchang Dam (WTBH)
	Pahang		Sg. Triang	4PH93	Muka sauk Loji Rawatan Air Sg. Triang
			Sg. Gapoi	4PH95	Muka sauk 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
Kelantan	Kelantan	48	Sg. Chiku	4KE66	Muka sauk 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	**55**	**25**	**49**	**55**	

Jadual 4.6 JAS : Parameter-Parameter Pengukuran Kualiti Air Sungai
Table 4.6 DOE: 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
Kemasinan / Salinity	ppt
Kekeruhan / Turbidity	NTU
Pepejal terlarut / Dissolved solids	mg/l
Pepejal / Total solids	mg/l
Nitrat / Nitrate (NO3)	mg/l
Klorida / Chloride (Cl)	mg/l
Fosfat / Phosphate (PO4)	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 / Calsium (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
E-coli	cfu/100ml
Total Coliform	cfu/100ml

Pada tahun 2017, sejumlah 5,697 sampel air sungai telah diuji dan sebanyak 180,329 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*). Indeks Kualiti Air (IKA) ditentukan dengan mengambilkira kepentingan enam parameter penunjuk pencemaran utama iaitu Oksigen Terlarut (DO), Keperluan Oksigen Biokimia (BOD), Keperluan Oksigen Kimia (COD), Ammonia Nitrogen (NH3N), pH, dan Pepejal Terampai (SS).

In 2017, a total of 5,697 river water samples were tested and a sum of 180,329 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. 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 (NH3N), pH, and Suspended Solids (SS)

Jabatan Alam Sekitar turut memantau kualiti air sungai dibawah Program *River of Life (RoL)* iaitu salah satu Program *National Key Economic Area (NKEA)* bagi *Greater Kuala Lumpur / Klang Valley (GK/KV)*. Antara objektif utama *RoL* adalah untuk membersihkan dan memperbaiki kualiti air di sepanjang 110 km bahagian-bahagian Sungai Klang dan Sungai Gombak pada tahun 2020. Jabatan Alam Sekitar 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 Program *River of Life (RoL)* adalah seperti di **Jadual 4.7**.

The Department of Environment is also involved in the program River of Life (RoL), one of the NKEAs Program for Greater Kuala Lumpur / Klang Valley. Among the main objectives 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 monitored for the rivers in the Klang River Water Quality Regional, namely Sungai Klang, Sungai Gombak, Sungai Batu and Sungai Jinjang. The list of 35 monitoring stations in the RoL program is as shown in **Table 4.7**.

Jadual 4.7 JAS : Senarai Stesen Pemantauan Projek River Of Life (RoL)
Table 4.7 DOE : 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						**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 JAS : Program dan Aktiviti Program Pengawasan Kualiti Air Sungai
Table 4.8 DOE : Programs and Activities Regarding to River Water Quality

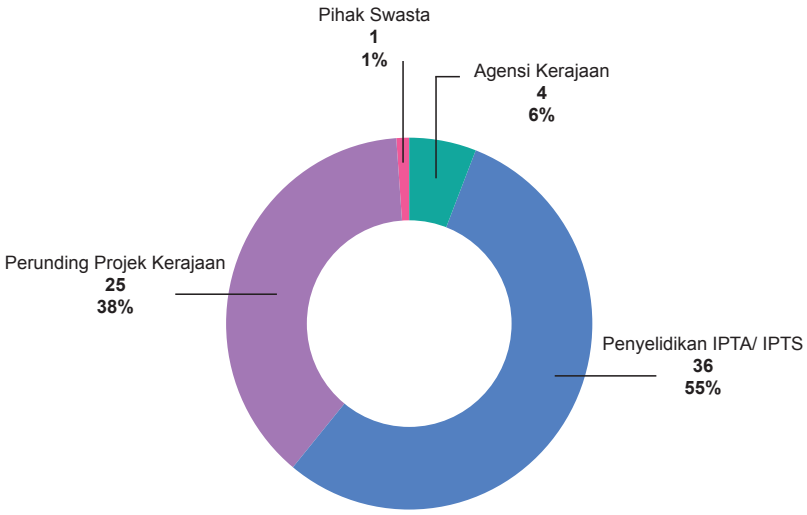
Tarikh Date	Aktiviti & Program Activities & Programmes	Tempat Venue
22-23 Februari 2017	Mesyuarat Penyelarasan Kumpulan Kerja (Kualiti dan Standard)- (WG4) Dasar Sumber Air Negara (DSAN) dan Program Minilab Kajian Total Maximum Daily Load (TMDL) JAS 2017	Hotel Royal Chulan
12 Mei 2017	Mesyuarat Jawatankuasa Peneraju Kumpulan Kerja Dasar Sumber Air Negara (JPKKDSAN)	Jabatan Pengairan dan Saliran Malaysia
15 Mei 2017	Mesyuarat Jawatankuasa Pasukan Petugas Dasar Sumber Air Negara (PPDSAN)	Jabatan Pengairan dan Saliran Malaysia
19 Mei 2017	Mesyuarat Jawatankuasa Pengurusan Sumber Air Negara (JPSAN) Bil.1/2017	Kementerian Sumber Asli
13 - 15 September 2017	Mesyuarat dan Minilab Penyelarasan Kumpulan Kerja (Kualiti & Standard) - WG4 Dasar Sumber Air Negara (DSAN) dan Program Minilab Total Maximum Daily Load (TMDL) Ke Arah Mengarus Perdana Alam Sekitar 2017	Hotel Equatorial Melaka
15 Disember 2017	Mesyuarat Jawatankuasa Pasukan Petugas Dasar Sumber Air Negara (PPDSAN) Bil. 2/2017	Kementerian Sumber Asli

Sebaran Data Kualiti Air Sungai

Data-data kualiti air sungai telah digunakan oleh dua kategori pengguna utama iaitu agensi/ jabatan kerajaan dan penuntut institusi pengajian tinggi yang menjalankan kajian berkaitan kualiti air sungai. Pada tahun 2017, sejumlah enam puluh enam (66) permohonan data telah diterima oleh JAS melibatkan sejumlah 573, 141 data kualiti air sungai. Sebanyak 55% daripada permohonan data kualiti air sungai adalah daripada golongan penyelidik di institusi pengajian tinggi, manakala 38% daripada perunding bagi projek kerajaan, manakala selebihnya adalah dari agensi kerajaan dan pihak swasta. Bilangan permohonan data kualiti air sungai yang diterima oleh JAS pada tahun 2017 adalah seperti yang ditunjukkan oleh **Rajah 4.1.**

Dissemination of River Water Quality Data

River water quality data were utilized by two categories of user which are government agencies, and researchers from higher learning institutions. In 2017, a total of sixty six (66) data request were received by DOE covering 573, 141 water quality data points. About 55% of the requests were from researchers from higher learning institutions, 25% from consultant for government project, and the rest from government agencies and privates. The number of application for water quality data received by DOE in 2017 as shown in **Figure 4.1.**



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

PENGAWASAN KUALITI AIR TANAH
GROUNDWATER QUALITY MONITORING

Program Pengawasan Kualiti Air Tanah Kebangsaan telah dimulakan pada tahun 1997 di Semenanjung Malaysia dan diperkembangkan ke Sabah dan Sarawak pada tahun 2003 seperti didalam **Peta 4.2 (a) dan 4.2 (b).**

Groundwater quality monitoring was established in 1997 for Peninsular Malaysia and extended to cover Sabah and Sarawak in 2003 shown in **Map 4.2 (a) and 4.2 (b).**

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

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

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

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

Projek-Projek Yang Dijalankan Di Bawah Rancangan Malaysia Ke 11 (RMK 11)

Projects Under The 11th Malaysian Plan (RMK 11)

Jabatan Alam Sekitar telah menjalankan dua (2) projek di bawah RMK 11. Projek-projek tersebut adalah seperti berikut :-

The Department of Environment has conducted two (2) projects under the Malaysian Plan 11. The projects are as follows

1. Kajian Pembentukan Standard Kualiti Air Tanah Dan Indeks Kualiti Air Tanah

   Kajian ini dijalankan selama dua (2) tahun iaitu bermula pada tahun 2016 dan berakhir pada tahun 2017. Kajian ini bertujuan untuk menghasilkan satu piawaian bagi pengkelasan air tanah dengan mengambil kira keupayaan air tanah menyerap bahan pencemar mengikut kegunaan berfaedah. Hasil dari kajian yang dijalankan terdapat tiga (3) Standard Kualiti Air Tanah iaitu :-

   i. Standard Kualiti Air Tanah Untuk Kegunaan Berfaedah Air Minuman;

   ii. Standard Kualiti Air Tanah Untuk Kegunaan Berfaedah Pertanian;

   iii. Standard Kualiti Air Tanah Untuk Kegunaan Berfaedah Industri ;

Selain dari Standard Kualiti Air Tanah yang dibentuk, kajian juga telah membentuk Indeks Kualiti Air Tanah (IKAT).

1. Development Of Groundwater Quality Standard Development And Groundwater Quality Index

   The study was conducted for two (2) years starting from 2016 and ends in 2017. The purpose of this study is to produce a standard for groundwater classification which is taking into account the ability of soil water to absorb pollutants by beneficial uses. The results of the study were three (3) Water Quality Standards namely :-

   i. Groundwater Quality Standard for Beneficial Potable

   ii. Use Groundwater Quality Standard for Beneficial Agriculture Use

   iii. Groundwater Quality Standard for Beneficial Industrial Use

In addition to the Groundwater Quality Standards, the study has also developed the Groundwater Quality Index (GWQI).

2. Rangkaian Stesen Pengawasan Air Tanah Kebangsaan Di Malaysia

Projek telah bermula pada tahun 2017 dan akan berakhir pada tahun 2018. Program ini bertujuan mempertingkatkan 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 akan dibina di Semenanjung Malaysia

Bengkel Di Bawah Projek RMK-11 Bagi Projek-Projek Stesen Pengawasan Kualiti Air Tanah Kebangsaan 1/2017

Bengkel di bawah projek RMK-11 bagi projek-projek Stesen Pengawasan Kualiti Air Tanah telah dijalankan pada 24 Oktober dan 25 Oktober 2017 di Kinrara Resort, Puchong Selangor Darul Ehsan. Objektif bengkel adalah :-

i. Menerangkan maklumat berkaitan perancangan pembinaan Stesen Pengawasan Air Tanah Kebangsaan yang merangkumi pembinaan bagi sepuluh (10) lokasi yang telah dipersetujui untuk penempatan stesen pengawasan air tanah di negeri berkaitan dan, keperluan teknikal di lapangan semasa kerja-kerja pembinaan Stesen Pengawasan Air Tanah;

ii. Menyampaikan maklumat mengenai hasil daripada Kajian Pembentukan Standard Kualiti Air Tanah Kebangsaan :

- Pemakaian Standard Kualiti Air Tanah ;
- Pemakaian Indeks Kualiti Air Tanah ; dan
- Menyemak semula *Standard Operating Procedure (SOP)* untuk pengawasan air tanah

Bengkel ini dikendalikan oleh sekumpulan pakar daripada Wiranda Sdn. Bhd. dan RBI Cosultant . Kumpulan pakar ini adalah merupakan jururunding dan kontraktor bagi projek RMK 11.

Peserta bengkel terdiri daripada pegawai dari Jabatan Alam Sekitar Negeri dan Ibu Pejabat.

2. Network Of Groundwater Monitoring Station In Malaysia

The project started in the year 2017 and will be complete in year 2018. Objective of the project is to enhance a 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 will be built in Peninsular Malaysia

Workshop Under The Projects Of 11th Malaysian Plan For National Groundwater Monitoring Station 1/2017

Workshop under the 11th Malaysian Plan for National Groundwater Monitoring Station projects was held on 24th October to 25th October, 2017 at Kinrara Resort, Puchong Selangor Darul Ehsan. The objective of the workshop : -

i. Explain the information related to the development of the National Groundwater Monitoring Station Station which includes the construction of ten (10) locations that have been agreed for the placement of groundwater monitoring stations in the relevant state and, technical requirements in the field during the construction work of the Groundwater Monitoring Station;

ii. Delivering information on outcomes from the Study of Development Groundwater Quality Standards :

- Application of Ground Water Quality Standards ;
- Application of Groundwater Quality Index (GWQI) ; and
- Revised of Standard Operating Procedure (SOP) for groundwater monitoring

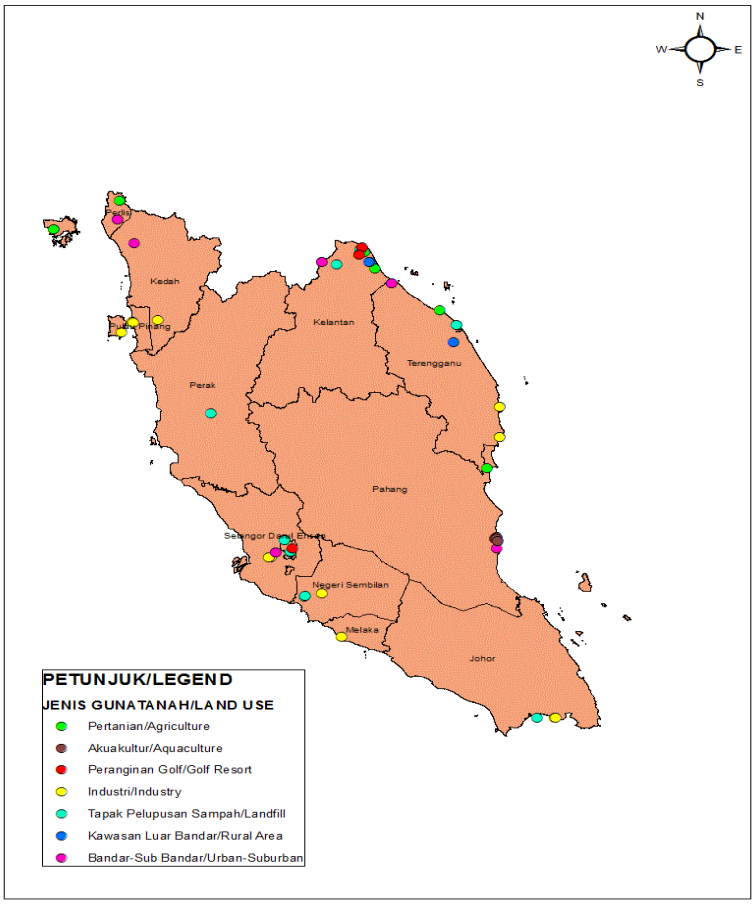
The workshop was conducted by a group of experts from Wiranda Sdn. Bhd. And RBI Cosultant. This expert group is a consultant and contractor for the 11th Malaysian Plan project.

Participants of the workshop are the officers from the Department of Environment Headquarter and state offices.

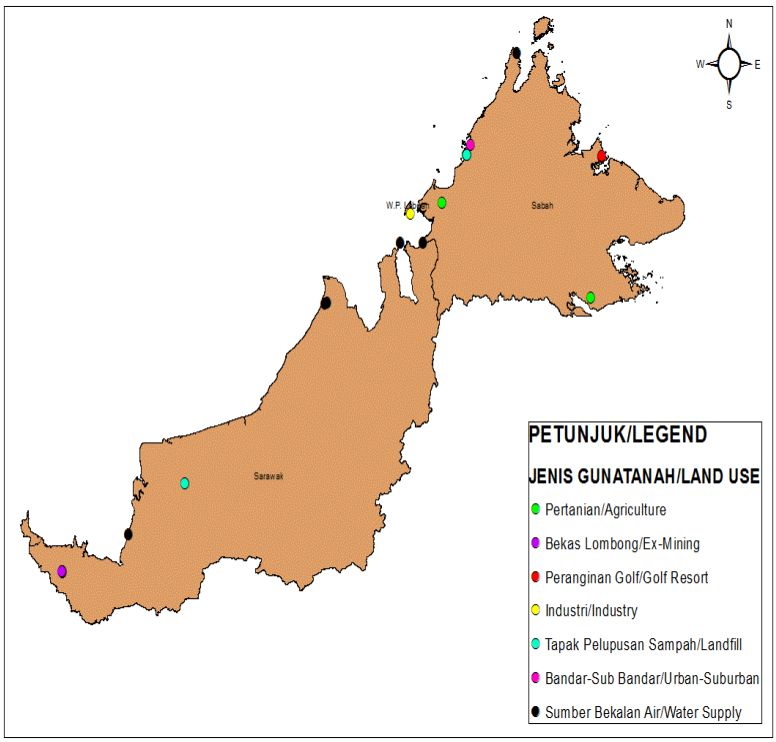
Bengkel dibawah projek RMK 11 bagi Projek-projek Stesen Pengawasan Kualiti Air Tanah
Workshop under the 11th Malaysia Plan for National Groundwater Monitoring Station projects

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

Kaedah Analisa Analysis Method	Parameter Parameter
In-Situ Insitu	Suhu/ Temperature pH/ 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



Rajah 4.2 (a) Semenanjung Malaysia: Taburan Stesen Pemantauan Air Tanah, 2016
Figure 4.1 (a) Peninsular Malaysia: Distribution of Groundwater Monitoring Stations, 2016



Rajah 4.2 (b) Sabah & Sarawak: Taburan Stesen Pemantauan Air Tanah, 2016
Figure 4.2 (b) Sabah & Sarawak: Distribution of Groundwater Monitoring Stations, 2016

RANCANGAN KONTINGENSI KEBANGSAAN KAWALAN TUMPAHAN MINYAK
NATIONAL OIL SPILL CONTINGENCY PLAN

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, dan dipengerusikan oleh Ketua Pengarah Jabatan Alam Sekitar Malaysia. Kesiapsiagaan kawalan tumpahan minyak adalah melalui peralatan mengawal tumpahan minyak yang ditempatkan di lokasi-lokasi strategik seperti **Peta 4.3**. 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 mekanisma tindakbalas RKKKTM.

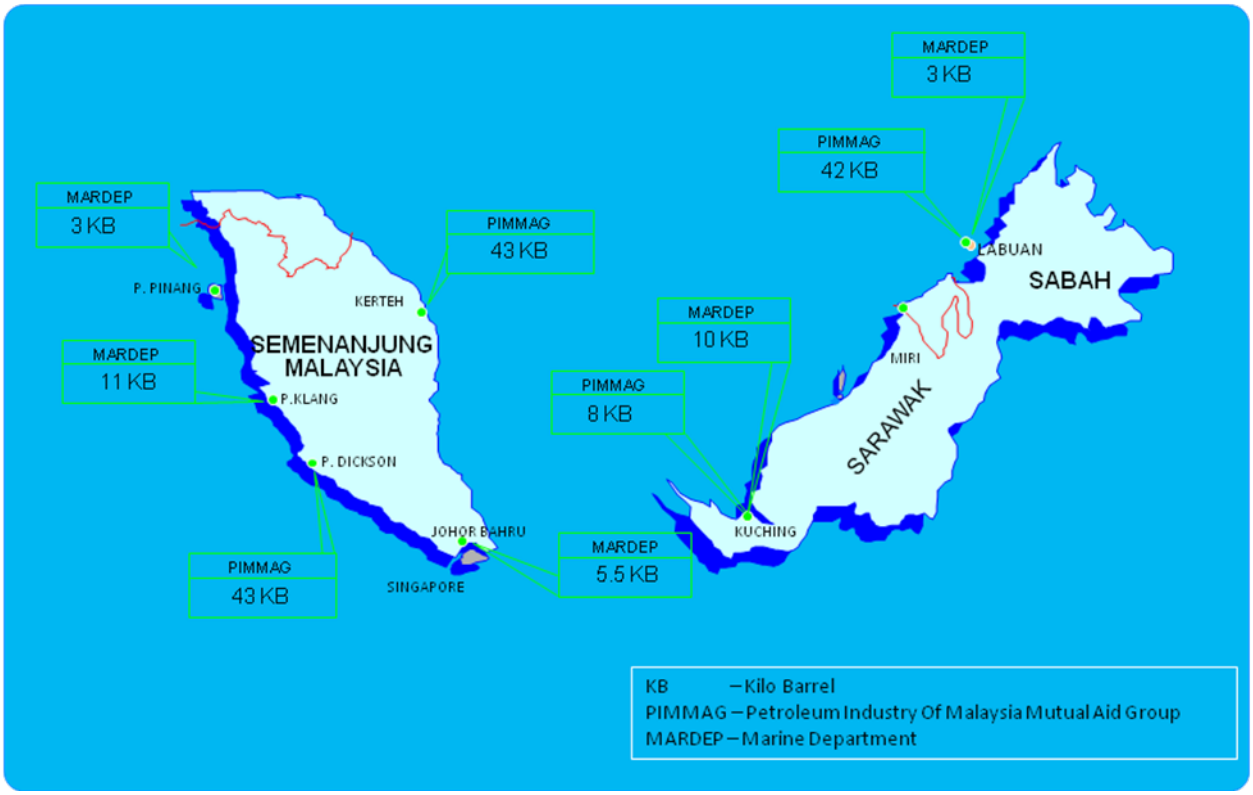
The National Oil Spill Contingency Plan (NOSCP) is a contingency plan which provides guidelines to address oil spill incident in Malaysian waters. The NOSCP is administered by the National Oil Spill Control Committee (NOSCC) consisting of seventeen (17) member departments and agencies, chaired by the 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 4.3**. 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 our NOSCP response system.

Di sepanjang tahun 2017, sebanyak enam (6) 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 4.10.**

Throughout 2017, a total of enam (6) 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 4.10.**

Jadual 4.10 JAS : Aktiviti Kawalan Tumpahan Minyak 2017
Table 4.10 DOE : Oil Spill Activities 2017

Bil No	Aktiviti Activities	Tarikh Dates
i.	Mesyuarat dan Bengkel Penyediaan Terma Rujukan (TOR) Bagi Pembangunan Sistem Pangkalan Data Hydrocarbon Fingerprinting, Hotel Bangi-Putrajaya Meeting and Workshop on Preparation of Terms of Reference (TOR) for the Development of Hydrocarbon Fingerprinting Database System, Hotel Bangi-Putrajaya	29 – 31 Mac 2017 29 – 31 March 2017
ii.	Mesyuarat Teknikal Revolving Fund Committee (RFC) di Holiday Villa Hotel langkawi Revolving Fund Committee (RFC) Technical Meeting in Holiday Villa Hotel Langkawi	12 – 14 April 2017 12 – 14 April 2017
iii.	Mesyuarat dan Bengkel User Requirement Spesification (URS) Bagi Pembangunan Sistem Hydrocarbon Fingerprinting, Hotel Bangi-Putrajaya Meeting and Workshop on Preparation of User Requirement Spesification (URS) for the Development of Hydrocarbon Fingerprinting System, Hotel Bangi-Putrajaya	7 – 11 Ogos 2017 7 – 11 August 2017
iv.	Mesyuarat Jawatankuasa Induk Revolving Fund Committee (RFC) di Phoenix Hotel Johor Revolving Fund Committee (RFC) Meeting in Phoenix Hotel Johor	18 – 19 September 2017 18 – 19 September 2017
v.	Mesyuarat dan Bengkel System Requirement Spesification (SRS) Bagi Pembangunan Sistem Hydrocarbon Fingerprinting, Hotel Bangi-Putrajaya Meeting and Workshop on Preparation of System Requirement Spesification (SRS) for the Development of Hydrocarbon Fingerprinting System, Hotel Bangi-Putrajaya	23 – 25 Oktober 2017 23 – 25 October 2017
vi.	Latihan Table Top Kawalan Tumpahan Minyak Peringkat Kebangsaan 2017 di Gambang Resort Pahang National Oil Spill Control Table Top Exercise 2017 in Gambang Resort Pahang	7 – 10 November 2017 7 – 10 November 2017



Peta 4.3 JAS: Lokasi Peralatan Melawan Tumpahan Minyak Dan Keupayaan Di Malaysia, 2017.
Map 4.3 DOE: Location Of Oil Spill Equipment Stockpile And Capability In Malaysia, 2017.

- Mesyuarat dan Bengkel System Requirement Spesification (SRS) Bagi Pembangunan Sistem Hydrocarbon Fingerprinting di Hotel Bangi-Putrajaya pada 23 Oktober hingga 25 Oktober 2017
  Meeting and Workshop on Preparation of System Requirement Spesification (SRS) for the Development of Hydrocarbon Fingerprinting System at Hotel Bangi-Putrajaya from 23rd October to 25th October, 2017

- Bengkel Penyediaan Terma Rujukan (TOR) Bagi Pembangunan Sistem Pangkalan Data Hydrocarbon Fingerprinting di Hotel Bangi-Putrajaya pada 29 Mac hingga 31 Mac 2017
  Meeting and Workshop on Preparation of Terms of Reference (TOR) for the Development of Hydrocarbon Fingerprinting Database System, Hotel Bangi-Putrajaya, from 29th March to 31st March, 2017

- Latihan *Table Top* Kawalan Tumpahan Minyak Peringkat Kebangsaan 2017 di Gambang Resort Pahang pada 8 November hingga 10 November 2017
  National Oil Spill Control Table Top Exercise 2017 in Gambang Resort Pahang from 8th November to 10th November, 2017

- Mesyuarat dan Bengkel *User Requirement Spesification (URS)* Bagi Pembangunan Sistem *Hydrocarbon Fingerprinting* di Hotel Bangi-Putrajaya pada 7 Ogos hingga 11 Ogos 2017
  Meeting and Workshop on Preparation of User Requirement Spesification (URS) for the Development of Hydrocarbon Fingerprinting System at Hotel Bangi-Putrajaya from 7th August to 11th August, 2017

JAWATANKUASA TABUNG PUSINGAN BAGI SELAT MELAKA DAN SELAT SINGAPURA
STRAITS OF MALACCA AND SINGAPORE REVOLVING FUND COMMITTEE (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

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

Pengurusan Tabung ini adalah diurus 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. Bagaimana pun, pada 30 Januari 2017, Pengerusi dan pentadbiran RFC telah di ambil alih oleh Malaysia daripada Indonesia bagi tempoh lima (5) tahun sehingga 31 Mac 2021.

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. However, on 30th January, 2017 the Chairmanship and administration of RFC was transitioned from Indonesia to Malaysia for the duration of five (5) years until 31st March, 2021.

Antara aktiviti yang dilaksanakan oleh Jawatankuasa Tabung Pusingan pada tahun 2017 adalah seperti berikut:

Among the activities carried out by the RFC in the year 2017 are:

i. *International Chemical and Oil Pollution Conference and Exhibition (ICOPCE)* dari 25 April hingga 28 April 2017 di Marina Bay Sands Singapura.

i. International Chemical and Oil Pollution Conference and Exhibition (ICOPCE) from 25th April to 28th April, 2017 in Marina Bay Sands Singapore.

ii. Mesyuarat Teknikal *Revolving Fund Committee (RFC)* pada 12 April hingga 14 April 2017 di Holiday Villa Hotel Langkawi.

ii. Revolving Fund Committee (RFC) Technical Meeting from 12th April to 14th April, 2017 in Holiday Villa Hotel Langkawi.

Mesyuarat Jawatankuasa Induk *Revolving Fund Committee (RFC)* pada 18 September hingga 19 September 2017 di Phoenix Hotel Johor.

Revolving Fund Committee (RFC) Meeting from 18th September to 19th September, 2017 in Phoenix Hotel Johore.

Mesyuarat Jawatankuasa Induk *Revolving Fund Committee* (RFC) Di Phoenix Hotel Johor pada 18 September hingga 19 September 2017
Revolving Fund Committee (RFC) Meeting at Phoenix Hotel Johor from 18th September to 19th September, 2017

Mesyuarat Teknikal *Revolving Fund Committee* (RFC). di Holiday Villa Hotel langkawi pada 12 April hingga 14 April 2017
Revolving Fund Committee (RFC) Technical Meeting at Holiday Villa Hotel Langkawi from 12th April to 14th April, 2017

- Mesyuarat Jawatankuasa Induk *Revolving Fund Committee* (RFC) Di Phoenix Hotel Johor pada 18 September hingga 19 September 2017
  Revolving Fund Committee (RFC) Meeting at Phoenix Hotel Johor from 18th September to 19th September, 2017

- Mesyuarat Teknikal *Revolving Fund Committee* (RFC). di Holiday Villa Hotel langkawi pada 12 April hingga 14 April 2017
  Revolving Fund Committee (RFC) Technical Meeting at Holiday Villa Hotel Langkawi from 12th April to 14th April, 2017

- Mesyuarat Teknikal *Revolving Fund Committee* (RFC). di Holiday Villa Hotel langkawi pada 12 April hingga 14 April 2017
  Revolving Fund Committee (RFC) Technical Meeting at Holiday Villa Hotel Langkawi from 12th April to 14th April, 2017

PENCEMARAN MARIN

Sepanjang tahun 2017, sejumlah tiga puluh enam (36) kes aduan pencemaran tumpahan minyak telah dilaporkan kepada Jabatan Alam Sekitar iaitu empat belas (14) kes berlaku di Laut China Selatan, satu (1) kes di Laut Sulu, tujuh belas (17) kes di Selat Melaka dan empat(4) kes di Selat Johor **(Jadual 4.9)**.

MARINE POLLUTION

Throughout 2017, there were thirty six (36) cases of marine pollution from oil spills were reported to Department of Environment whereby fourteen (14) cases occurred in the South China Sea, one (1) case in the Sulu Sea, seventeen (17) cases in the Straits of Malacca and four (4) cases in the Straits of Johore **(Table 4.9)**.

Jadual 4.9: Kejadian Pencemaran Minyak 2017
Table 4.9: Oil Pollution Incidents 2017

Lokasi Location	Kawasan Area		Bil. Kes No. of Cases	Negeri State
Laut China Selatan South China Sea	Perairan Malaysia Malaysia Territory	Semenanjung Peninsular	10	Pahang (2) Terengganu (2) Johor (5) Sarawak (1)
		Malaysia Timur East Malaysia	4	Sabah (4)
	Zon Ekonomi Ekslusif (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 (6) Selangor (6) Johor (1)
Selat Johor Straits of Johor	Perairan Malaysia Malaysia Territory	Barat West	-	-
		Timur East	4	Johor (4)
Jumlah Total			36	

PUNCA PENCEMARAN

Pencemaran air umumnya berpunca daripada pelepasan punca-punca pencemaran tetap dan punca tidak tetap. Pencemaran daripada punca tetap berlaku akibat pelepasan effluen samada terawat, separa terawat ataupun mentah, yang dilepaskan ke alur air atau sungai melalui limpahan atau paip.

Akta Kualiti Alam Sekeliling 1974 mengawal pelepasan pencemar daripada punca tetap seperti industri pembuatan, industri berasaskan pertanian seperti kilang getah dan kilang kelapa sawit dan loji rawatan kumbahan. Pelepasan pencemaran daripada aktiviti ternakan haiwan seperti ternakan babi dan pasar basah dilesenkan dan di kawal oleh agensi lain seperti Jabatan Perkhidmatan Veterinar dan Pihak Berkuasa Tempatan.

Punca tidak tetap adalah punca pencemaran yang tidak mempunyai takat pelepasan yang tetap dan ianya hanya berlaku ketika dan selepas hujan serta kejadian banjir, mengakibatkan aliran permukaan membawa pencemar ke hilir sungai atau ke laut.

Pada tahun 2017, Jabatan Alam Sekitar merekodkan sejumlah 1,339,212 punca pencemaran tetap yang terdiri daripada 1,333, 807 loji rawatan kumbahan 3,271 industri pembuatan, 883 pasar basah, 730 ladang ternakan babi dan 521 industri berasaskan pertanian. Perincian jenis punca tetap dan jumlah punca ditunjukkan seperti di dalam **Jadual 4.10.**

POLLUTION SOURCES

Water pollution are generally due to the discharge contributed by point sources and non-point sources. Point sources (PS) are referred as the source of polluted water or discharges, and channeled into a water body through outfalls or pipes.

Environmental Quality Act (EQA) 1974 controlling pollution's discharge from point sources includes manufacturing industries, agro-based industries including rubber mill and palm oil mill and sewage treatment plant. Whereas discharge from animal farming such as piggery and wet market were licensed and control by others agency as Veterinary Services Department and Local Authorities.

Non-point sources are diffuse source that do not have specific discharge point, and normally occurs during rainfall and in the event of floods, which cause surface run-off to sweep all pollutants and wash it downstream.

In 2017, a total of 1,339,212 water pollution sources were recorded, which comprises 1,333, 807 sewage treatment plants, 3,271 manufacturing industries, 883 wet markets, 730 piggeries and 521 agro-based manufacturing mills and the composition of water pollution sources is shown in **Table 4.10.**

Jadual 4.10 JAS: Pecahan punca-punca pencemaran mengikut sektor, 2017
Table 4.10 DOE: Composition of water pollution sources by Sector, 2017

Bil. No.	Jenis Punca Type of sources	Bilangan punca No. of sources
1	Industri pembuatan Manufacturing industries	3271
2	Industri berasaskan pertanian Agro-based industries	
	i. Kilang getah / Rubber mills	60
	ii. Kilang kelapa sawit / Palm oil mills	461
3	Ladang ternakan (babi) / Animal farms (Pig)	730
4	Loji pengolahan kumbahan Sewage treatment plants	
	i. Awam / Public	6,950
	ii. Tangki Septik Individu / Individual Septic Tanks (IST)	1,313,031
	iii. Tangki Septik Berpusat / Communal Septic Tanks (CST)	3634
	iv. Sekolah Rendah/ Primary School	7776
	v. Sekolah Menengah/ Secondary School	2416
5	Pasar basah / Wet markets"	883
	Jumlah/ Total	1,339,212

PROGRAM PENGAWASAN KUALITI ALAM SEKITAR

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

EQMP ini adalah penambahbaikan daripada sistem pengawasan kualiti alam sekitar yang telah digunapakai oleh Jabatan Alam Sekitar sejak tahun 1995. Antara tahun 1995 hingga tahun 2015, pengawasan alam sekitar JAS hanya merangkumi komponen udara dan air sungai sahaja. Skop pengawasan kini telah diperluaskan kepada komponen seperti berikut :

- Komponen Udara
- Komponen Air Sungai
- Komponen Air Marin
- Pusat Data Alam Sekitar

Syarikat Pakar Scieno TW Sdn Bhd telah dilantik sebagai syarikat konsesi yang menjalankan Program Pengawasan Kualiti Alam Sekitar di bawah Kementerian Sumber Asli dan Alam Sekitar melalui Jabatan Alam Sekitar bagi tempoh selama lima belas (15) tahun bermula tahun 2017 sehingga Januari 2032.

Sistem pengawasan EQMP ini bukan sahaja berperanan sebagai mekanisma 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 membuat keputusan melalui penyediaan input pelaksanaan aktiviti penguatkuasaan dan perancangan projek-projek pembangunan demi kesejahteraan rakyat dan negara.

THE ENVIRONMENTAL QUALITY MONITORING PROGRAMME (EQMP)

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

The EQMP is an improvement of the environmental quality monitoring system that has been adopted by the Department of Environment (DOE) since 1995. Between the year 1995 to 2015, only air and river water quality were monitored by DOE. The scope has now been expanded and comprise the following components :

- Air
- River
- Marine Water
- Environmental Data Centre (EDC)

The company, Pakar Scieno TW Sdn Bhd has been appointed as the concessionaire to run the Environmental Quality Monitoring Programmes under the Ministry of Natural Resources and Environment through the Department of Environment for a period of fifthteen (15) years from 2017 to January 2032.

The EQMP's monitoring system does not only serve as an early warning mechanism for the occurrence of environmental pollution incidents such as haze, oil spill disaster, and illegal disposal of toxic and harmful industrial wastes but also assist policy makers and decision makers by providing of inputs to the enforcement activities and planning of projects development for the sake of the country and people well-being.

Taburan Stesen Pengawasan di Malaysia

	UDARA		SUNGAI		MARIN	
	Auto	Manual	Auto	Manual	Auto	Manual
Johor	8	3	4	227	2	63
Kedah	4	1	2	73	0	26
Kelantan	2	1	1	83	0	14
Kuala Lumpur	2	3	1	25	0	0
Melaka	3	1	2	55	0	23
Negeri Sembilan	3	1	3	65	1	17
Pahang	5	2	2	192	0	36
Perak	5	1	2	149	0	19
Perlis	1	0	1	15	0	3
Pulau Pinang	4	1	1	67	1	33
Sabah	5	0	2	118	0	43
Sarawak	12	0	2	117	2	40
Selangor	5	0	5	98	1	19
Terengganu	4	0	2	69	2	40
Putrajaya	1	0	0	0	0	0
Labuan	1	0	0	0	1	12
JUMLAH STESEN	65	14	30	1353	10	388

Stesen Pengawasan Kualiti Udara Automatik
The Continuous Air Quality Monitoring station

Stesen Pengawasan Kualiti Air Sungai Automatik
The Continuous River Water Quality Monitoring station

Stesen Pengawasan Kualiti Air Marin Automatik
The Continuous Marine Water Quality Monitoring station

Perasmian Pusat Kawalan Alam Sekitar Nasional termasuk Pusat Data Alam Sekitar di bawah Program EQMP
Launching of National Environmental Command Centre (NECC) including Environmental Data Centre (EDC), under EQMP Programme

Pusat Data Alam Sekitar
Environmental Data Centre (EDC)

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 2017 sebanyak 329 kes hotspots di seluruh negara telah dilaporkan melalui satelit **(Jadual 4.11)**.

Sebanyak 1,868 kes pembakaran terbuka pula telah dikesan pada tahun 2017 **(Jadual 4.12, Jadual 4.13 dan Rajah 4.2)** dan dilaporkan oleh setiap JAS Negeri melalui sistem dalaman JAS iaitu Sistem e-KAS (Modul Pembakaran Terbuka dan Modul Aduan). Kejadian pembakaran terbuka yang utama sering berlaku adalah di kawasan yang dikategorikan sebagai lain-lain (1,159 kes), belukar (145 kes), pertanian (144 kes) dan tapak pelupusan (127 kes) terutamanya semasa cuaca panas dan kering iaitu pada bulan Julai (128 kes) dan Oktober (127 kes). Kes-kes pembakaran terbuka yang termasuk dalam kategori lain-lain antaranya adalah pembakaran sampah sarap di kawasan perumahan, pembakaran sampah sarap di tepi bahu jalan dan pembakaran untuk aktiviti keagamaan atau penyembahan. Daripada 1,868 kes pembakaran terbuka tersebut, 192 kes telah dikompaun dengan jumlah kompaun yang dikutip ialah sebanyak RM 275,000.00.

Berdasarkan kepada data bilangan hotspot serta pembakaran terbuka bagi tempoh 5 tahun kebelakang iaitu dari tahun 2013 sehingga 2017 **(Rajah 4.2)**, tahun 2017 mencatatkan jumlah bilangan hotspot dan kes pembakaran terbuka yang paling rendah. Manakala kes hotspot dan pembakaran terbuka tertinggi dalam tempoh tersebut dicatatkan pada tahun 2014 iaitu bilangan hotspot sebanyak 4,354 dan bilangan kes pembakaran terbuka sebanyak 6,083 kes.

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 2017, a total of 329 hotspots were detected via satellites **(Table 4.11)**.

Meanwhile, a total of 1,868 open burning cases were detected in 2017 and these cases were reported in DOE's internal system, which is e-KAS reporting system (Open Burning Module and Complaint Module) by the DOE state offices **(Table 4.12, Table 4.13 and Figure 4.2)**. 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) (1159 cases), bushes (145 cases), agricultural areas (144 cases) and disposal sites (127 cases), that normally occured during the hot and dry period in the months of July (128 cases) and October (127 cases). Out of 1,868 open burning cases detected, 192 cases were issued with compounds amounting to RM 275,000.00.

According to the data on hotspot numbers and open burning for the 5 year period from 2013 to 2017 **(Figure 4.2)**, 2017 recorded the lowest number of hotspots and open burning cases. While the highest hotspot and open burning cases during the period were recorded in 2014, which 4354 of hotspots and 6083 of open burning cases were recorded.

Jadual 4.11 JAS : Bilangan Kes Hotspot Dikesan Melalui Satelit Mengikut Negeri, 2017 (Sumber: ASMC)
Table 4.11 DOE: Number of HotspotsDetected through Satellite by States, 2017 (Source: ASMC)

Negeri State	Bulan Month												Jumlah Total
	Jan Jan	Feb Feb	Mac March	April April	Mei May	Jun June	Julai July	Ogos Aug	Sep Sept	Okt Oct	Nov Nov	Dis Dec	
Johor	0	0	2	0	0	0	3	2	2	2	0	4	15
Kedah	0	1	2	0	0	0	0	1	0	0	0	0	4
Kelantan	1	0	2	1	1	1	0	2	1	0	1	0	10
Melaka	0	0	0	1	1	0	0	0	1	0	0	0	3
Negeri Sembilan	0	0	1	0	0	0	2	0	0	0	0	0	3
Pahang	0	0	5	4	5	4	16	0	4	6	0	2	46
Perak	1	0	3	0	0	1	1	0	0	0	0	0	6
Perlis	0	0	3	0	0	0	0	0	0	0	0	0	3
Penang	0	0	0	0	0	0	0	0	0	0	0	0	0
Sabah	2	1	4	11	1	2	7	24	7	2	3	1	65
Sarawak	12	15	5	9	13	8	30	26	16	9	4	1	148
Selangor	0	0	0	0	0	0	0	2	0	3	0	0	5
Terengganu	0	0	3	5	3	1	2	2	3	1	1	0	21
W.P. KL/ 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	16	17	30	31	24	17	61	59	34	23	9	8	329
JUMLAH KESELURUHAN/ TOTAL : 329													

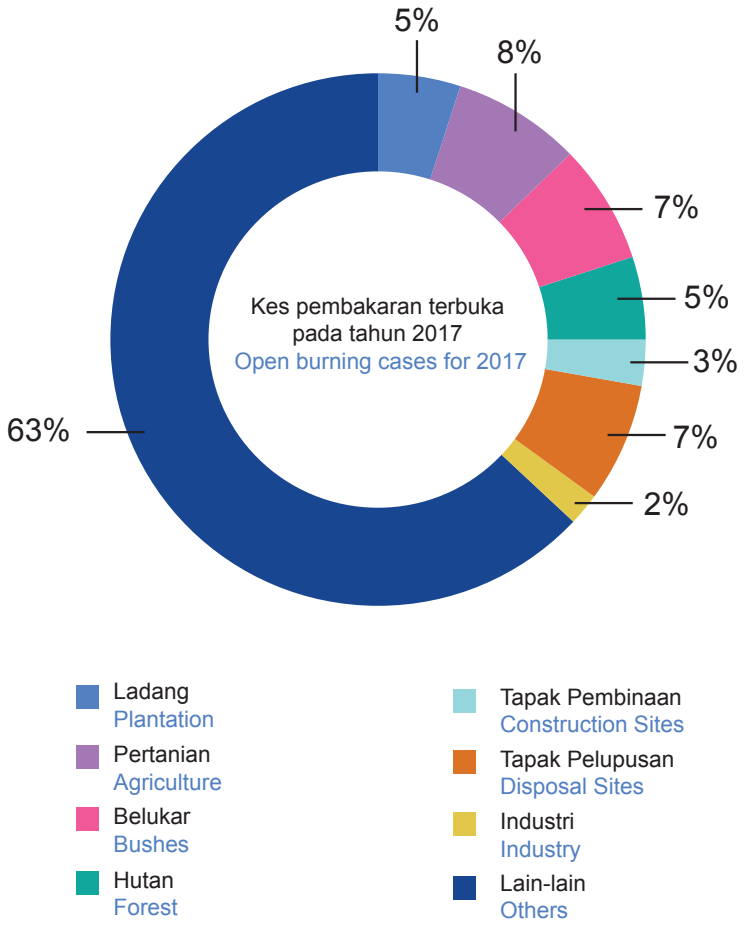
Jadual 4.12 JAS : Bilangan Hotspot Mengikut Kategori, 2017
Table 4.12 DOE: Number of Hotpots by Category, 2017

Negeri State	Kategori Categories							
	Ladang Plantation	Pertanian Agriculture	Belukar Bushes	Hutan Forest	Tapak Pembinaan Construction Sites	Tapak Pelupusan Disposal Sites	Industri Industry	Lain-lain others
Johor	10	10	9	2	14	12	0	133
Kedah	1	8	17	6	5	8	3	69
Kelantan	12	5	3	6	3	0	0	30
Melaka	4	5	7	0	2	4	3	58
Negeri Sembilan	3	11	5	0	3	5	0	39
Pahang	10	4	27	26	11	15	2	37
Perak	5	7	8	7	6	5	2	93
Perlis	1	2	1	0	0	0	0	3
P.Pinang	3	12	5	3	1	10	0	165
Sabah	7	32	3	15	3	9	2	89
Sarawak	34	38	39	27	0	1	14	68
Selangor	3	5	3	2	9	44	1	196
Terengganu	1	2	11	5	2	1	7	52
W.P. KL /Putrajaya	0	2	7	0	7	13	0	122
W.P. Labuan	0	1	0	0	0	0	0	5
Jumlah / Total	94	144	145	99	66	127	34	1159
JUMLAH KESELURUHAN/ TOTAL : 1868								

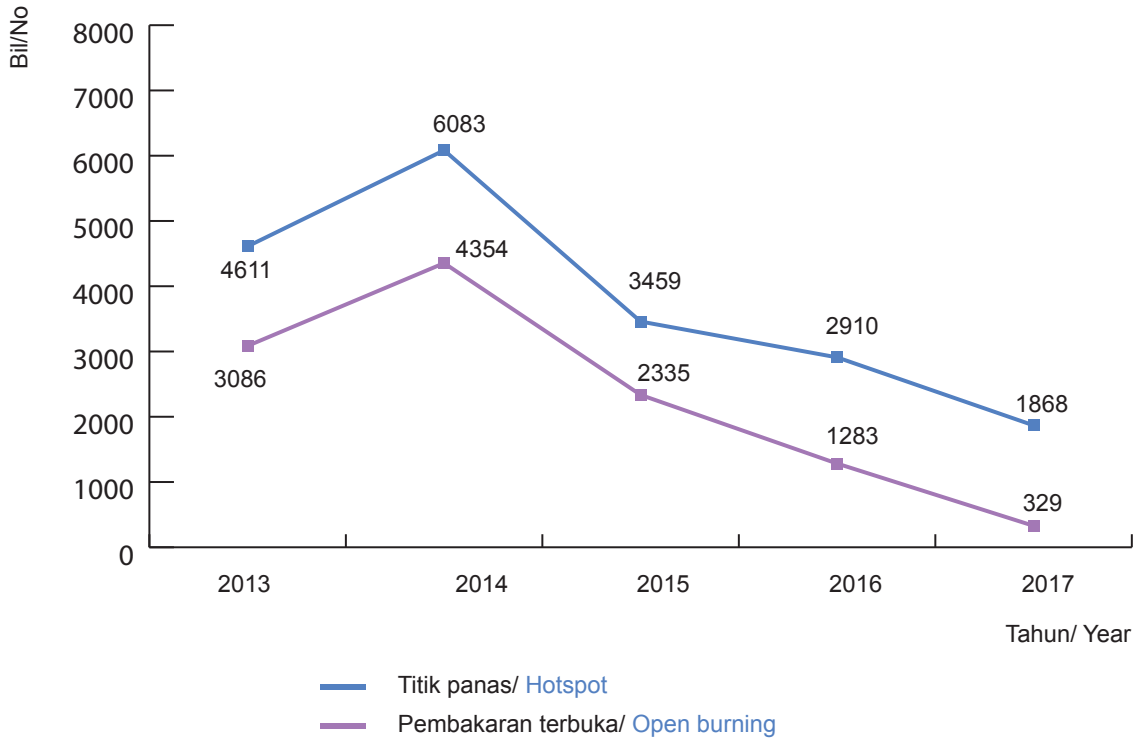
Jadual 4.13 JAS : Bilangan Hotspot Mengikut Bulan dan Kategori, 2017
Table 4.13 DOE: Number of Hotspot by Month and Category, 2017

Bulan Month	Kategori Categories							
	Ladang Plantation	Pertanian Agriculture	Belukar Bushes	Hutan Forest	Tapak Pembinaan Construction Sites	Tapak Pelupusan Disposal Sites	Industri Industry	Lain-lain others
Januari / January	4	14	14	3	4	8	1	96
Februari / February	7	11	12	10	8	10	1	82
Mac / March	8	7	16	16	3	13	0	87
April / April	3	8	9	12	7	12	0	83
Mei / May	9	9	18	7	10	10	5	95
Jun / June	7	5	3	7	5	15	7	95
Julai / July	14	33	15	15	11	15	5	128
Ogos / August	14	20	16	10	4	13	6	117
September / September	11	9	13	5	2	8	4	71
Oktober / October	8	19	12	8	7	7	2	127
November / November	2	4	7	2	3	5	1	65
December / December	7	5	10	4	2	11	2	113
Jumlah / Total	**94**	**144**	**145**	**99**	**66**	**127**	**34**	**1159**
JUMLAH KESELURUHAN / TOTAL : 1,868								

Nota/Note :
*Lain-lain - Pembakaran sampah sarap di kawasan perumahan, tepi jalan dan aktiviti keagamaan/penyembahan
*Others - Burning garbage in residential areas, streets and religious activities / worship



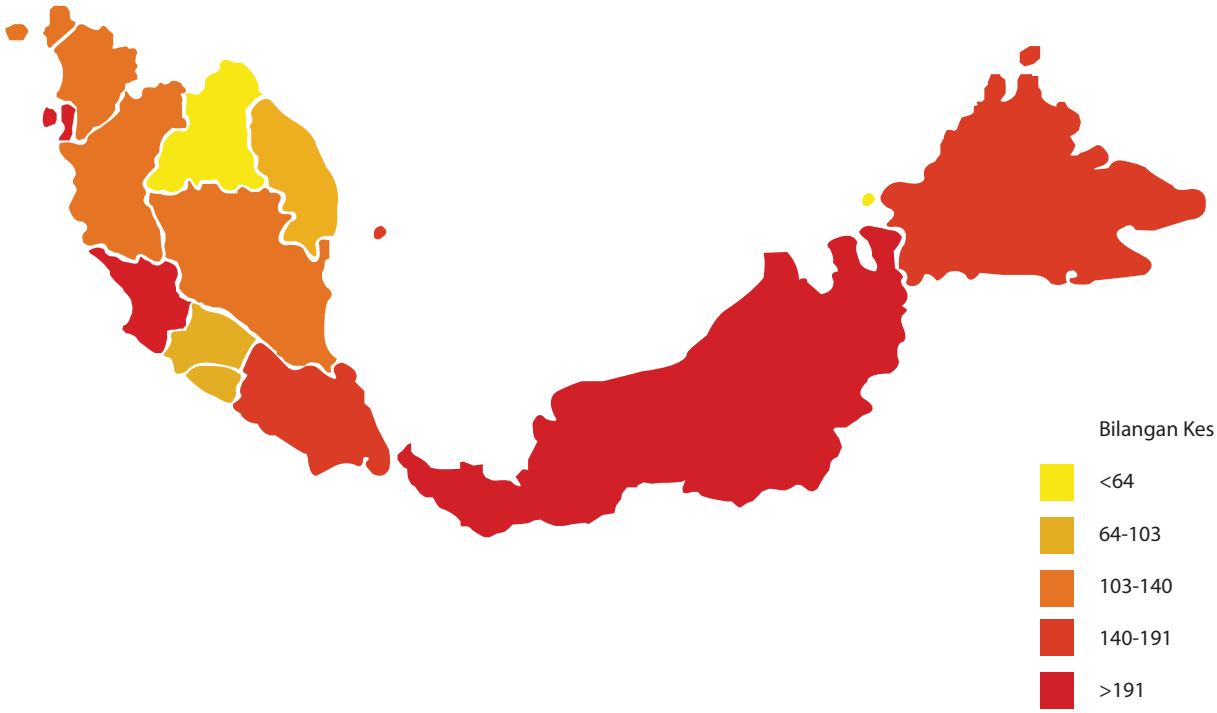
Rajah 4.2 JAS: Bilangan Kes Pembakaran Terbuka Mengikut Kategori, 2017
Figure 4.2 DOE: Number Of Open Burning Cases By Categories,2017



Rajah 4.2 JAS : Bilangan hotspot dan kes pembakaran terbuka dari tahun 2013 sehingga tahun 2017
Figure 4.2 DOE : Number of hotspot and open burning cases from 2013 to 2017

PENGUATKUASAAN TERHADAP AKTIVITI PEMBAKARAN TERBUKA
ENFORCEMENT AGAINST OPEN BURNING ACTIVITIES

Taburan bilangan kes pembakaran terbuka pada tahun 2017
Distribution number of open burning cases in 2017



1868
Kes pembakaran terbuka pada tahun 2017
Open burning cases in 2017

329
Bilangan hotspot
Number of hotspot

RM 275,000
Kompaun dibayar
Compounds paid

192
Kompaun dikeluarkan
Compounds issued

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 perkapalan. Manakala penghapusan hidroklorofluorokarbon (HCFC) sedang dijalankan dan akan diberhentikan pengimportan menjelang tahun 2030.

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 dan strategi jangka panjang untuk menghapuskan penggunaan HCFC mulai tahun 2012 hingga 2040. **Jadual 4.14** menunjukkan jadual strategi dan polisi dalam pelaksanaan HPMP. **Rajah 4.3** 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 penggunaan untuk penyenggaraan sahaja) dan HCFC menjadi larangan mutlak pada tahun 2040. **Rajah 4.4** menunjukkan pengimportan HCFC pada tahun 2017 yang berjumlah 3,833.66 metrik tan.

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

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 HCFC starting from 2012 until 2040. **Table 4.14** shows the policies and strategies of HPMP. **Figure 4.3** 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 4.4** shows the importation of HCFC in 2017 amounted to 3,833.66 metric tonnes.

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 tahap pembekuan berjumlah sebanyak 515.8 ODPT (*Ozone Depleting Potential Tonnes*) atau sebanyak 7,900 Metrik Tan.

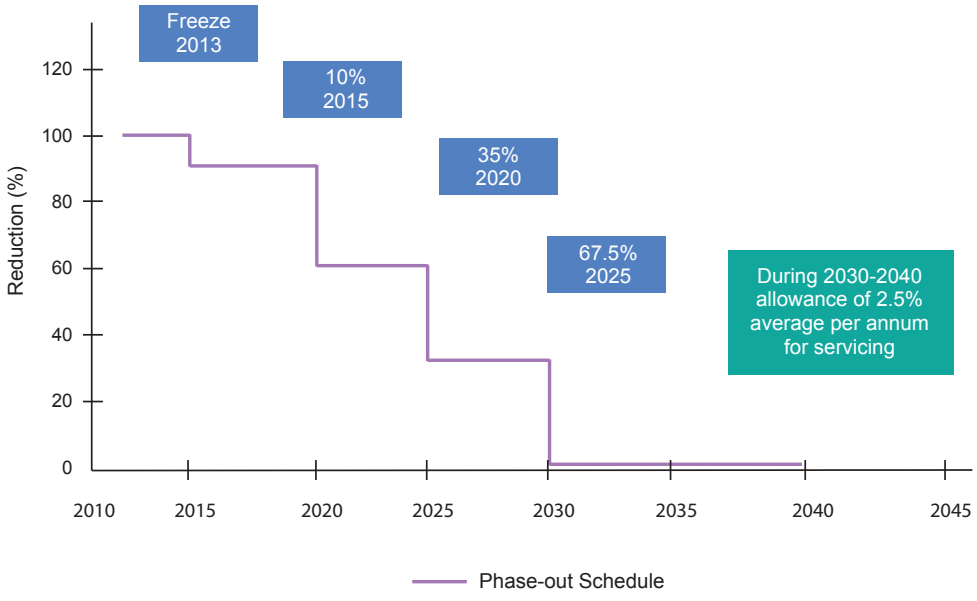
On 1st January, 2013, Malaysia implemented the quota system for the importation of HCFC. Application for Approval Permit (AP) was processed by DOE through an online 'e-Permit' system within the quota given with the total amount of HCFC allocated according to baseline level or freeze limit of 515.8 ODPT (ozone depleting potential tonnes) or 7900 metric tonnes.

Sistem atas talian,"e-Permit", telah diwujudkan untuk memproses dan seterusnya meluluskan permohonan import dan eksport HCFC. Sistem atas talian ini melibatkan jaringan diantara pengimport/pengeskport 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 2017, sebanyak 214 permohonan untuk mengimport HCFC telah diterima daripada enam belas (16) pengimport berdaftar dan sebanyak lapan (8) permohonan untuk mengeksport HCFC telah diterima melalui sistem e-Permit.

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 2017, 214 applications to import HCFC from sixteen (16) registered importers and eight (8) applications to export HCFC were received via the system.

Jadual 4.14 JAS : Polisi dan strategi perundangan Pelan Penghapusan HCFC (HPMP) (2012-2040)
Table 4.14 DOE : 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 baseline 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 polyol 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 (essential use) 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
2025	Larangan pemasangan baru semua barangan dan peralatan yang menggunakan No more new installation of products and equipment using HCFCs
2030	Pemberian AP terhad kepada 2.5% daripada jumlah baseline dan hanya untuk sektor servis sahaja 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 4.3 JAS : Jadual Penghapusan HCFC

Figure 4.3 DOE : HCFC Phase Out Schedule Consumption

Rajah 4.4 JAS : Tren Penggunaan HCFC Di Malaysia, 1996-2017

Figure 4.4 DOE : HCFC Consumption Trend in Malaysia, 1996-2017

Pelan Pengurusan Penghapusan HCFC (HPMP)

Pada 21 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 Commitee (ExCOM) for the Implementation of Montreal Protocol* yang telah diadakan pada 3 November 2016, mesyuarat telah meluluskan Pelan Pengurusan Penghapusan HCFC Peringkat II berjumlah sebanyak USD 6,138,063 lagi 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 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 (2) tahun pertama 2017 hingga 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, projek-projek di bawah sektor penyejukbekuan dan penyaman udara (RACs) terbahagi kepada empat (4) komponen utama iaitu latihan juruteknik servis termasuk refrigeran yang bersifat rendah GWP dan yang mudah terbakar, latihan pegawai penguatkuasaan bagi memantau dan mengawal pengimportan bahan pemusnah ozon, pembelian peralatan bagi demonstrasi amalan baik di dalam sektor servis refrigeran dan refrigeran yang bersifat mudah terbakar kepada Pusat Latihan Bertauliah (ATC) dengan melengkapkan peralatan latihan dan meningkatkan pembangunan kapasiti kepada dua (2) Pusat Kecemerlangan (Centre of Excellence) yang dilantik iaitu Industrial Training Institute Kepala Batas dan UNIKL-MFI.

The HCFC Phase-out Management Plan (HPMP)

On 21st March, 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 Commitee Meeting (ExCOM) for the Implementation of the Montreal Protocol held on 3rd 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 servicing sector.

The Implementation of the Stage II HPMP Plan is from 2017 to 2022. The focus during the first two (2) years 2017 to 2019 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) to 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.

Meanwhile, under the refrigeration and servicing sector (RACs), projects are divided into four (4) major components namely service technician training which includes low GWP and flammable refrigerants, training for enforcement officers to monitor and control the importation of ozone-depleting substances, procurement of equipment for good practice demonstrations in the refrigeration service sector and flammable refrigerant to the Accredited Training Center (ATC) through providing training equipment and enhancing capacity building to the two (2) appointed Center of Excellence which are Institut Latihan Perindustrian Kepala Batas dan UNIKL-MFI.

Pada 8 Mei 2017, YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar , Menteri Sumber Asli dan Alam Sekitar telah merasmikan Seminar HPMP Peringkat II. Seminar turut disertai dan ucaptama dari *Chief of Montreal Protocol and Chemical Unit UNDP New York*, Ms Xiao Fang. Majlis perasmian telah disertai oleh lebih kurang 500 peserta yang terdiri dari agensi Kerajaan dan pihak industri termasuk wakil UNDP, Malaysian Air Conditioning & Refrigeration Association (MACRA), Pusat Latihan Bertauliah (ATC), pihak swasta, serta badan bukan kerajaan (NGOs). Majlis tersebut telah menyaksikan penyampaian perjanjian (*Memorandum of Aggrement*) kepada sepuluh (10) premis sektor busa yang penggunaannya melebihi 20 MT serta pelantikan UNIKL-MFI dan Institut Latihan Perindustrian Kepala Batas sebagai Pusat Kecemerlangan (*Centre of Excellence*).

On 8th May 2017, YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Minister of Natural Resources and Environment officiated the Stage II HPMP Seminar. UNDP New York Chief of Protocol and Chemical Unit, Ms. Xiao Fang also attended the Seminar. The opening ceremony was attended by about 500 participants from Government agencies and industry including representatives from the UNDP, the Malaysian Air Conditioning & Refrigeration Association (MACRA), the Certified Training Center (ATC), the private sector, and NGOs. The ceremony has witnessed the delivery of the Memorandum of Agreement to the ten (10) foams industry with over 20 MT usage and the appointment of UNIKL-MFI and Kepala Batas Industrial Training Institute as Centre of Excellence.

Seminar HPMP Peringkat 2 bertempat di Saujana Hotel Kuala Lumpur pada 8 Mei 2017
Stage 2 HPMP Seminar at Saujana Hotel Kuala Lumpur on 8th May, 2017

Pada 21 Ogos hingga 23 Ogos 2017, satu sesi *Consultative Workshop With The International Experts In Foam Sector For HCFC Phase-Out Management Plan - Stage* 2 telah diadakan di Grand Blue Wave Hotel, Shah Alam, Selangor. Sesi konsultatif bersama kumpulan pakar busa antarabangsa ini diadakan dengan kerjasama UNDP dan Seksyen Perlindungan Ozon, Bahagian Udara bersama dengan semua pemilik industri busa dan *system houses* yang terdapat di Malaysia. Bengkel ini bertujuan bagi berkongsi maklumat dan pengetahuan teknikal di dalam memberi panduan dan nasihat untuk melaksanakan aktiviti penghapusan HCFC. Seminar serta lawatan ke lapangan ke beberapa premis busa diadakan bagi mendapatkan maklumat serta memberi nasihat dan halatuju kepada premis bagi pelaksanaan penghapusan HCFC di bawah Pelan HPMP Peringkat II ini.

In 21st August to 23rd August, 2017, a consultative workshop with The International Experts In Foam Sector For HCFC Phase-Out Management Plan - Stage 2 was held at Grand Blue Wave Hotel, Shah Alam, Selangor. A consultative session and visits to foam premises with the international foam experts was conducted in collaboration with UNDP and the Ozone Protection Section, Air Division, Department of Environment Malaysia together with all foam industry owners and system houses. The workshop aims to share information and technical knowledge in providing guidance and advice on the conversion technologies to the industries.

Bengkel Konsultatif dengan pakar antarabangsa dalam Sektor Busa HPMP *Stage 2* pada 21 Ogos 2017 di Hotel Blue Wave Shah Alam Selangor.
Consultative Workshop with international experts in the HPMP Stage 2 for Foam Sector on 21st August 2017 at Blue Wave Hotel Shah Alam Selangor.

Pada keseluruhannya, pelaksanaan projek di bawah HPMP Peringkat 1 berjalan lancar dan selesai pada Jun 2017 dimana projek bagi Pusat Kitar Semula dan tebusguna bahan pemusnah ozon iaitu kepada enam (6) lokasi yang telah dikenalpasti dan projek demonstrasi sistem penyejukan CO_2 telah disempurnakan. Kejayaan pelaksanaan HPMP ini akan membolehkan pengurangan sebanyak 77.36 ODP tan penggunaan HCFC dan akan mengurangkan sebanyak 1.35 juta tan pelepasan langsung karbon dioksida (CO_2 equivalent).

In overall, the implementation of the project under HPMP Stage 1 went smoothly and completed in June 2017 within the completion of the last two projects. The project for the ODS Recycling and Reclaim Centres were at six (6) identified premises and a demonstration project using carbon dioxide as alternatives refrigerant at one of supermarket in the Klang Valley. The successful implementation of HPMP will enable a reduction of 77.36 ODP tonnes of HCFC consumption and will reduce by 1.35 million tons of direct carbon dioxide (CO2 equivalent).

Satu siri latihan telah diadakan untuk memberi maklumat mengenai teknologi terkini kepada agensi penguatkuasa dalam usaha menghapuskan penggunaan HCFC. Pada tahun 2017 latihan kepada 67 orang pegawai penguatkuasaan dari Jabatan Kastam DiRaja Malaysia (JKDM) dan JAS telah diadakan pada 23 Julai hingga 27 Julai 2017 bertempat di KSL Hotel And Resort, Johor Bahru, Johor. Siri latihan ini memberi pendedahan mengenai kawalan import dan eksport bahan pemusnah ozon dan memberi penekanan kepada pencegahan penyeludupan bahan tersebut. Para peserta juga didedahkan mengenai tatacara penggunaan alat pengesan refrigeran (*Refrigerant Identifier*).

A series of trainings was held to provide information on the latest technologies to enforcement agencies as an effort to eliminate HCFC use. In 2017, a training to 67 enforcement officers from Royal Malaysian Customs Department and DOE was held from 23rd July to 27th July, 2017 at KSL Hotel and Resort, Johor Bahru, Johor. This training provides information on the import and export control of ozone depleting materials and emphasize on the prevention and smuggling of the substances. The participants were also given the exposure on the procedure of using the refrigerant identifier.

Kursus Kawalan Bahan Pemusnah Ozon bagi Pegawai Penguatkuasa dari JKDM dan JAS.
Course on Control of Ozone Depleting Substances for enforcement officer from RMCD and DOE ص

Pengurusan Halon

Halon tidak lagi digunakan bagi pemasangan baru sistem mengawal kebakaran dan alat-alat pemadam api di Malaysia. Sebaliknya, air, karbon dioksida, gas "inert" atau bahan kimia HFC kini digunakan sebagai alternatif. Walau bagaimanapun kegunaan halon masih dibenarkan untuk tujuan terhad kepada sistem keselamatan kawalan kebakaran tentera dan penerbangan awam sepertimana dipersetujui di bawah Protokol Montreal. Pada tahun 2017, Pusat Bank Halon Kebangsaan yang dikelolakan oleh Jabatan Bomba dan Penyelamat telah telah melaporkan sebanyak 85,225 kg jenis Halon 1301 dan 7,144 kg Halon 1211 disimpan di Pusat tersebut. Penggunaan sebarang sistem pencegahan kebakaran yang menggunakan alternatif kepada halon perlu mendapatkan kelulusan bertulis daripada Jabatan Bomba dan Penyelamat Malaysia terlebih dahulu sebelum sistem tersebut digunakan.

Halon Management

Halon is no longer used in Malaysia for new installation of fire protection systems and fire extinguishers. Instead, water, carbon dioxide, inert gas or chemical powders are now being used as alternatives. However, halon usage is still allowed but it is restricted only for essential use in fire safety protection systems in military and civil aviation industries, as agreed under the Montreal Protocol. In 2017, the National Halon Bank managed by the Fire and Rescue Department in Bandar Baru Enstek, Negeri Sembilan recorded that 85225 kg of Halon 1301 and 7144 kg Halon 1211 and stored in the Bank. Prior written approval from the Fire and Rescue Department of Malaysia is required for the use of alternatives to halon in any new fire-fighting system.

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

Pentauliahan 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.

Sepanjang tahun 2017, sebanyak 245 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. 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.

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.

In 2017, 245 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. 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.

Di samping itu, Seksyen Perlindungan Ozon (SPO) Bahagian Udara, JAS telah menganjurkan satu bengkel bagi tenaga pengajar baru (*Master Trainer*) dari ATC telah diadakan pada 17 April hingga 21 April 2017 di Hotel Geno, Shah Alam Selangor yang bertujuan untuk memberi pentauliahan kepada tenaga-tenaga pengajar menjalankan menjalankan Program Persijilan Juruteknik Bertauliah (CSTP) sektor Penyejukbekuan dan Penyaman Udara (RACs).

The Ozone Protection Section under the Air Division of the DOE had organized a workshop for new Master Trainer from the ATC from 17th April to 21st April, 2017 at Hotel Geno, Shah Alam, Selangor. The objective of this programme was to certify the trainers from the ATC who conduct the Certification Service Technician Programme (CSTP) for RAC Sector.

Bengkel *Master Trainer for Technician in Refrigeration and Air Conditioning Servicing Sector* anjuran Jabatan Alam Sekitar Malaysia yang telah diadakan pada 17 April - 21 April 2017 di Hotel Geno, Shah Alam, Selangor.
Master Trainer Workshop for Technician in Refrigeration and Air Conditioning (RACs) Servicing Sector organized by Department of Environment was held from 17th April - 21st April, 2017 at Geno Hotel, Shah Alam, Selangor.

Program dan Kempen Kesedaran

Sambutan Hari Ozon Antarabangsa disambut diseluruh dunia setiap tahun pada 16 September sejak tahun 1994 bagi memperingati komitmen negara Parti kepada Protokol Montreal ke atas obligasi melindungi lapisan ozon. Sempena Sambutan 30 tahun Protokol Montreal, tema bagi tahun 2017 adalah "Caring for All Life Under the Sun" serta disokong dengan kempen "We are all Ozone Heroes" yang dilaksanakan dengan kolaborasi Ozone Secretariat dengan Marvel Comics. Kempen ini dilancarkan bertujuan bagi memberi semangat tidak kira latarbelakang dan kedudukan untuk bersama-sama melakukan perubahan dalam melindungi lapisan ozon serta meraikan kejayaan Protokol Montreal sebagai salah satu Perjanjian Perbagai Hala yang telah berjaya dalam memulihara lapisan ozon dan seterusnya mengurangkan kesan perubahan iklim.

Awareness Programme and Campaign

The International Ozone Day celebration is celebrated globally every year on September 16 since 1994 to commemorate Party's commitment to the Montreal Protocol on protecting the ozone layer. In conjunction with the 30th Anniversary of the Montreal Protocol, the theme for 2017 is "Caring for All Life Under the Sun" and is supported by the "We are all Ozone Heroes" campaign organised by the Ozone Secretariat in collaboration with Marvel Comics. The campaign was launched with the aim to encourage the public from all walks of life to make changes in protecting the ozone layer and celebrates the success of the Montreal Protocol as one of the Multilateral Environmental Agreements that has succeeded in conserving the ozone layer and in reducing the impact of climate change.

Sambutan Hari Ozon Antarabangsa pada setiap tahun mencerminkan usaha bersepadu masyarakat antarabangsa untuk menghasilkan persekitaran yang sihat demi kepentingan generasi akan datang. Sambutan Hari Ozon pada tahun 2017 telah diadakan pada 5 Oktober 2017 di Hotel Pullman, Putrajaya. Ianya telah dirasmikan oleh YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Menteri Sumber Asli dan Alam Sekitar. Hadir sama adalah YBhg. Dato' Sri Azizan Bin Ahmad, Ketua Setiausaha Kementerian Sumber Asli dan Alam Sekitar bersama- sama seramai lebih kurang 500 orang tetamu yang terdiri daripada agensi Kerajaan dan pihak industri termasuk wakil UNDP, Malaysian Air Conditioning & Refrigeration Association (MACRA), Pusat Latihan Bertauliah (ATC), pihak swasta, badan bukan kerajaan serta murid – murid sekolah di sekitar Putrajaya.

The International Ozone Day celebration annually reflects the international community's efforts to produce a healthy environment for the sake of future generations. The Ozone Day celebration in 2017 was held on 5th October, 2017 at Hotel Pullman, Putrajaya. It was officially opened by YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Minister of Natural Resources and Environment. Also present was YBhg. Dato 'Sri Azizan Bin Ahmad, Secretary General of the Natural Resources and Environment Ministry together with approximately 500 guests comprising government Agencies And Industry Including UNDP, Malaysian Air Conditioning & Refrigeration Association (MACRA), Certified Training Center ATC), private sector, non - governmental organizations as well as school children around Putrajaya.

Bersempena dengan majlis perasmian tersebut, YB Menteri juga telah melancarkan Dokumen Pelan Pengurusan Penghapusan HCFC Peringkat II di mana kemuncak majlis pelancaran adalah kemunculan "Iron Man" sebagai "Ozone Hero" iaitu mencerminkan wira ozon di dalam usaha melindungi lapisan ozon. Di samping itu, poster sambutan 30 Tahun Hari Ozon Antarabangsa yang diterbitkan oleh *United Nation Environment* bersama bahan-bahan risalah kesedaran perlindungan lapisan ozon telah dicetak dan diedarkan kepada para tetamu dan pengunjung pameran pada hari tersebut.

In conjunction with the opening ceremony, the YB Minister also launched the HCFC Stage 2 Management Plan Document where the highlight of the launching ceremony was the apperance of "Iron Man" as "Ozone Hero" which resembled the ozone hero in protecting the ozone layer. In addition , the International Ozone Day Celebration 30th anniversary poster published by the United Nation Environment with ozone layer protection awareness materials has been printed and distributed to all guests and exhibitors on that day.

Perutusan YB Menteri Sumber Asli dan Alam Sekitar telah disiarkan di dalam akhbar tempatan dan laman web, *Instagram* dan *Facebook* Kementerian dan JAS pada 16 September 2017.

On 16th September, 2017, YB Minister of Natural Resources and Environment Message on the International Ozone Day Celebration was published in the local newspapers as well as in Instagram and Facebook of Ministry of Natural Resources and DOE's facebook.

Mesyuarat *The Joint 11th Conference Of The Parties To The Vienna Convention dan The 29th Meeting Of Parties to the Montreal Protocol* telah diadakan di Montreal, Kanada pada 20 November hingga 24 November 2017. Delegasi Malaysia telah di ketuai oleh Ketua Setiausaha, Kementerian Sumber Asli dan Alam Sekitar, Dato Seri Azizan Ahmad. Beliau telah membacakan *Country Statement* mewakili Menteri Sumber Asli dan Alam Sekitar Malaysia semasa sesi Pegawai Peringkat Tinggi. Bersempena dengan sambutan ulangtahun ke 30 Protokol Montreal, Puan Aminah Ali telah menerima anugerah Kategori Kepimpinan Pelaksanaan Dasar dan Polisi semasa upacara *Ozone Awards* pada 23 November 2017.

The Joint 11th Conference of the Parties To the Vienna Convention and The 29th Meeting Of Parties to the Montreal Protocol was held on 20th November to 24th November, 2017 in Montreal, Canada. Malaysian delegation was led by the Permanent Secretary, Ministry of Natural Resources and the Environment Malaysia Dato' Seri Azizan Ahmad. On behalf of the Minister of Natural Resources and the Environment, the Country Statement was read during the High Level Segment. In conjunction with the 30th Anniversary of Montreal Protocol, the DOE ozone officer Madam Aminah Ali received the Ozone Awards for the category of Outstanding Leadership in Policy Implementation on 23rd November, 2017.

Kemunculan Iron Man semasa kemuncak pelancaran Dokumen Pelan Pengurusan Penghapusan HCFC (HPMP) Peringkat II
Iron Man's appearance as the highlight during the launching of the Stage II HCFC Phase-Out Management Plan Document (HPMP)

Perutusan YB Menteri Sumber Asli Dan Alam Sekitar Sempena Hari Ozon Antarabangsa pada 16 September 2017
Message of the Minister of Natural Resources and Environment in conjunction with International Ozone Day on 16th September, 2017

YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Menteri Sumber Asli dan Alam Sekitar bersama para tetamu yang hadir
YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Minister of Natural Resources and Environment with the guests

YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Menteri Sumber Asli dan Alam Sekitar , YBhg. Dato' Sri Azizan Bin Ahmad, Ketua Setiausaha dan Dato Dr. Ahmad Kamarulnajuib Bin Che Ibrahim, Ketua Pengarah Jabatan Alam Sekitar di ruang pameran
YB Dato Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Minister of Natural Resources and Environment, YBhg. Dato 'Sri Azizan Bin Ahmad, Secretary-General and Dato Dr. Ahmad Kamarulnajuib Bin Che Ibrahim, Director General of the Department of Environment at the exhibition hall

Delegasi Malaysia ke Mesyuarat *The Joint 11th Conference Of The Parties To The Vienna Convention* dan *The 29th Meeting Of Parties to the Montreal Protocol* telah diadakan di Montreal, Kanada pada 20 November hingga 24 November 2017.

Malaysia Delegation at The Joint 11th Conference Of the Parties To The Vienna Convention dan the 29th Meeting Of Parties to the Montreal Protocol.

Ketua Setiausaha, Kementerian Sumber Asli dan Alam Sekitar, Dato Seri Azizan Ahmad membacakan "Country Statement" di Mesyuarat *The 29th Meeting of Parties to the Montreal Protocol* pada 20 November hingga 24 November 2017 di Montreal, Canada.

The Permanent Secretary, Ministry of Natural Resources and the Environment Malaysia Dato' Seri Azizan Ahmad reading out the Country Statement during The 29th Meeting of Parties to the Montreal Protocol on 20th November to 24th November, 2017 in Montreal, Canada.

Jadual 4.15 JAS : Aktiviti-Aktiviti Latihan dan Kesedaran 2017
Table 4.15 DOE : Training and Awareness Activities 2017

Tarikh Date	Aktiviti & Program Activities & Programmes	Tempat Venue
16 Mac 2017	Seminar on Update On Refrigerants: Upcoming Major Impact On The Air-Conditioning Industry by MACRA	Hotel Pullman, Kuala Lumpur
23 Mac 2017	Seminar On Carbon Dioxide (CO_2) Refrigeration System Demonstration Project Under Hydroclouroflourocarbon Phase-Out Management Plan (HPMP) Stage 1	Hotel Marriot,Putrajaya
17-21 April 2017	Master Trainer Workshop for Technician in Refrigerant and Air Conditioning(RACs) Servicing Sector	Geno Hotel, Shah Alam Selangor
7 – 9 Mei 2017	Refrigerant,Management Course R32 and Carbon Dioxide (R744) in Refrigeration System	Saujana Hotel, Kuala Lumpur
8 Mei 2017	Seminar on Hydrochlorouflourocarbon Phase-Out Management Plan (HPMP) Stage II	Saujana Hotel, Kuala Lumpur
14 Jun 2017	Seminar on Refrigerants Phase Out: Way Forward in Malaysia	Dorsett Hotel, Putrajaya
23- 27 Julai 2017	Enforcement Course for Customs Officers on Ozone Depleting Substances (ODS)	Hotel KSL, Johor Bahru, Johor
20 – 24 Ogos 2017	HCFC Phase Out Management Plan Stage II – Consultative Workshop With International Experts In Foam Sector	Hotel Blue Wave, Shah Alam,Selangor
3 – 6 Oktober 2017	Master Trainer Refresher Course On Refrigerant Management In ODS Reclaimation Project And Carbon Dioxide (CO_2)	Pullman Hotel, Putrajaya
5 Oktober 2017	International Ozone Day Celebration	Pullman Hotel, Putrajaya
11-13 Disember 2017	Malaysia-Timor Leste South – South Cooperation on Capacity Building for the Implementation of Montreal Protocol	Putrajaya

Jadual 4.16 JAS : Mesyuarat yang dihadiri 2017
Table 4.16 DOE : Meetings Attended in 2017

Tarikh Date	Mesyuarat Meeting	Tempat Venue
3 – 7 April 2017	The 78th Meeting of the Executive Committee of Multilateral Fund of Montreal Protocol	Montreal, Canada
2 - 5 Mei 2017	Network Meeting and Thematic Workshops for Asia and the Pacific National Ozone Officers	Phuket, Thailand
3 - 7 Julai 2017	The 79th Meeting of the Executive Committee of Multilateral Fund of Montreal Protocol	Bangkok, Thailand
10 Julai 2017	Workshop on Safety Standard relevant to Low GWP alternatives	Bangkok, Thailand
11 - 14 Julai 2017	39th Open Ended Working Group Meeting	Bangkok, Thailand
13 - 17 November 2017	The 79th Meeting of the Executive Committee of Multilateral Fund of Montreal Protocol	Montreal, Canada
20 – 24 November 2017	The 29th Meeting of Parties to the Montreal Protocol	Montreal, Canada

KENDERAAN BERMOTOR

Sehingga akhir tahun 2017, sebanyak 28,738,194 buah kenderaan bermotor telah berdaftar di Malaysia, iaitu pertambahan sebanyak 1,125,074 buah kenderaan (4.07%) berbanding tahun 2016. Pecahan keseluruhan kenderaan bermotor yang berdaftar mengikut jenis kenderaan adalah seperti di **Rajah 4.5.**

Dari sejumlah 1,125,074 buah kenderaan baru yang didaftarkan dalam tahun 2017, kategori kereta merupakan yang tertinggi iaitu sebanyak 583,437 unit (51.86%) diikuti motosikal sebanyak 495,989 unit (44.09%), manakala sebanyak 45,648 unit (4.06%) adalah dari lain-lain jenis kenderaan termasuk lori, bas, van dan sebagainya.

Taburan bilangan kenderaan bermotor di Malaysia mengikut negeri adalah seperti di **Rajah 4.6.** Wilayah Persekutuan Kuala Lumpur mendahului negeri-negeri lain dengan mempunyai bilangan kenderaan yang tertinggi iaitu sebanyak 6,441,342 unit (atau 22.41%) daripada keseluruhan bilangan kenderaan yang berdaftar di negara ini, diikuti oleh negeri Johor, Selangor, Pulau 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 (NOx) 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.

Kawalan Pelepasan Asap Hitam Dari Kenderaan Diesel

Kawalan pelepasan asap hitam berlebihan dari ekzos kenderaan diesel dipantau melalui Program AWASI (*Area Watch And Sanction Inspection*). Melalui program ini, skuad peronda JAS akan menjalankan rondaan, pemerhatian pelepasan asap hitam dari ekzos kenderaan dan memberhentikan kenderaan untuk menjalankan uijan asap ke atas kenderaan-kenderaan diesel yang diperhatikan mengeluarkan asap hitam berlebihan.

MOTOR VEHICLES

As of end 2017, a total of 28,738,194 motor vehicles were registered in Malaysia, an increase of 1,125,074 units (4.07%) compared to 2016. The breakdown of the total registered vehicles according to vehicle types is given in **Figure 4.5.**

Out of 1,125,074 new vehicles registered in 2017, motorcars made up the highest number with 583,437 units (51.86%) followed by motorcycles 495,989 units (44.09%). While the remaining 45,648 units (4.06%) were from the other vehicle types such as lorries, buses, vans and others.

The distribution of registered vehicles throughout the states is given in **Figure 4.6.** The Federal Territory of Kuala Lumpur recorded the highest number of vehicles registered, with 6,441,342 units (or 22.41%) 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 (NOx) 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.

Control of Black Smoke Emission From Diesel Vehicles

The control of excessive black smoke emission emitted from diesel vehicle exhausts is monitored through the AWASI (Area Watch And Sanction Inspection) Programme. Through this programme the DOE's mobile squad would patrol the streets, observing, stop and testing diesel vehicles belching excessive smoke.

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

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

Pada tahun 2017, sebanyak 3,830 program penguatkuasaan telah dilaksanakan di bandar-bandar di seluruh negara. Sejumlah 459,446 buah kenderaan diesel telah diperiksa secara visual. Dari jumlah tersebut, sebanyak 326 buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan asap hitam sebanyak 50 HSU% kelegapan. Manakala 130 kenderaan telah dikenakan perintah larangan beroperasi sehingga lulus ujian asap semula oleh JAS. Pada keseluruhannya, peratus pematuhan oleh kenderaan diesel adalah 99.08%. Ini adalah penurunan sebanyak 0.27% berbanding dengan tahun 2016.

In 2017, a total of 3,830 enforcement programmes were conducted in the cities throughout the country. A total of 459,446 diesel vehicles were visually inspected. Out of these, 326 vehicles were compounded for failing to comply with the 50 HSU % opacity smoke limit while 130 vehicles issued with the prohibition order until passed or undergo smoke retest by the DOE. Generally, the percentage of compliance of diesel vehicles was 99.08%. This is an decrease of 0.27% compared to 2016.

Bilangan kenderaan diesel yang dikompaun dan peratus pematuhannya mengikut jenis kenderaan adalah seperti di **Rajah 4.7**. **Rajah 4.8** pula menunjukkan bilangan kenderaan dikompaun, pengeluaran perintah larangan serta peratus pematuhan mengikut negeri. Tindakan mahkamah telah juga diambil ke atas 15 pemandu serta pemilik kenderaan kerana gagal menjelaskan kompaun yang telah dikenakan. Sejumlah 2,689 kenderaan diesel juga telah diarahkan untuk menjalankan ujian semula di PUSPAKOM.

The number of diesel vehicles summoned and their percentage of compliance according to vehicle types is given in **Figure 4.7**. **Figure 4.8** shows the number of vehicles compounded, number of prohibition orders issued and the percentage of compliance according to the states. Court actions were also taken against 15 drivers and vehicle owners for failing to settle the compounds issued. A total of 2,689 diesel vehicles were instructed to undergo smoke retest at PUSPAKOM.

Kawalan Pelepasan Gas CO dan HC Dari Kenderaan Petrol

Control of CO and HC Gas Emissions from Petrol Vehicles

Sepanjang tahun 2017 sejumlah 238 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 tiga (3) buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan yang ditetapkan. Peratus pematuhan keseluruhannya adalah 98.74% iaitu peningkatan sebanyak 0.49% berbanding dengan tahun 2016. 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.

Throughout 2017, a total of 238 petrol engine vehicles were inspected using the CO-HC gas analyzer via the idling test method conducted at the road side. From the above total, three (3) vehicles were compounded for failing to comply with the stipulated CO and HC limits. The overall percentage of compliance is 98.74% i.e. a increase of 0.49% compared to 2015. Warning letters were also issued to drivers for immediate servicing of their vehicles to ensure compliance with the emission limits stipulated in the law.

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.

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 2017, Jabatan Alam Sekitar telah mengeluarkan 52 Sijil Ujian Kelulusan Jenis bagi model baru kenderaan petrol yang akan dipasarkan di Malaysia.

Type Approval Test (Petrol Vehicle)

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

Any new model of motor vehicle that is commissioned on or after 1st 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 2017, the Department of Environment has issued 52 Type Approval Test Certificates for new models of petrol vehicles to be marketed in Malaysia.

Ujian Kelulusan Jenis (Kenderaan Diesel)

Bagi mengawal pelepasan dari kenderaan berenjin diésel 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 2017, Jabatan Alam Sekitar telah mengeluarkan 58 Sijil Ujian Kelulusan Jenis bagi model baru kenderaan diesel yang akan dipasarkan di Malaysia.

Type Approval Test (Diesel Vehicle)

To control emissions from diesel vehicles in Malaysia. Each new model of motor vehicle on or after 1st January, 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 2017, the Department of Environment has issued 58 Certificate of Type Approval Test for the new model diesel vehicles to be marketed in Malaysia.

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

Sehingga akhir tahun 2017, sejumlah 132 sijil pengiktirafan telah dikeluarkan kepada bengkel serta pusat-pusat pemeriksaan kenderaan di seluruh negara sebagai sebagai "Kemudahan Yang Diluluskan" oleh JAS.

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 centres for the non-complying vehicles, to ensure they are always in compliance with the emission limits stipulated.

By the end of 2017, a total of 132 certificates of accreditation were issued to the workshops and vehicle testing centres throughout the country as "Approved Testing Facilities" by DOE.

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 2017, sebanyak 130 Sijil Kelulusan Jenis telah dikeluarkan kepada pembuat, pemasang dan pengimport motosikal untuk pasaran tempatan.

Control of Emission from Motorcycles

From 1st 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 19th July, 2002 or World of motorcycle emission test cycle "WMTC" under the European Committee ("EC") 2006/72 / EC of 18th August, 2006. Compliance with the EURO3 emission standards for motorcycles existing model are started on 1st January, 2017.

In 2017, a total of 130 Type Approval Test Certificates were issued to the manufacturers, assemblers and importers of motorcycles for the domestic market.

Bunyi Bising Kenderaan Bermotor

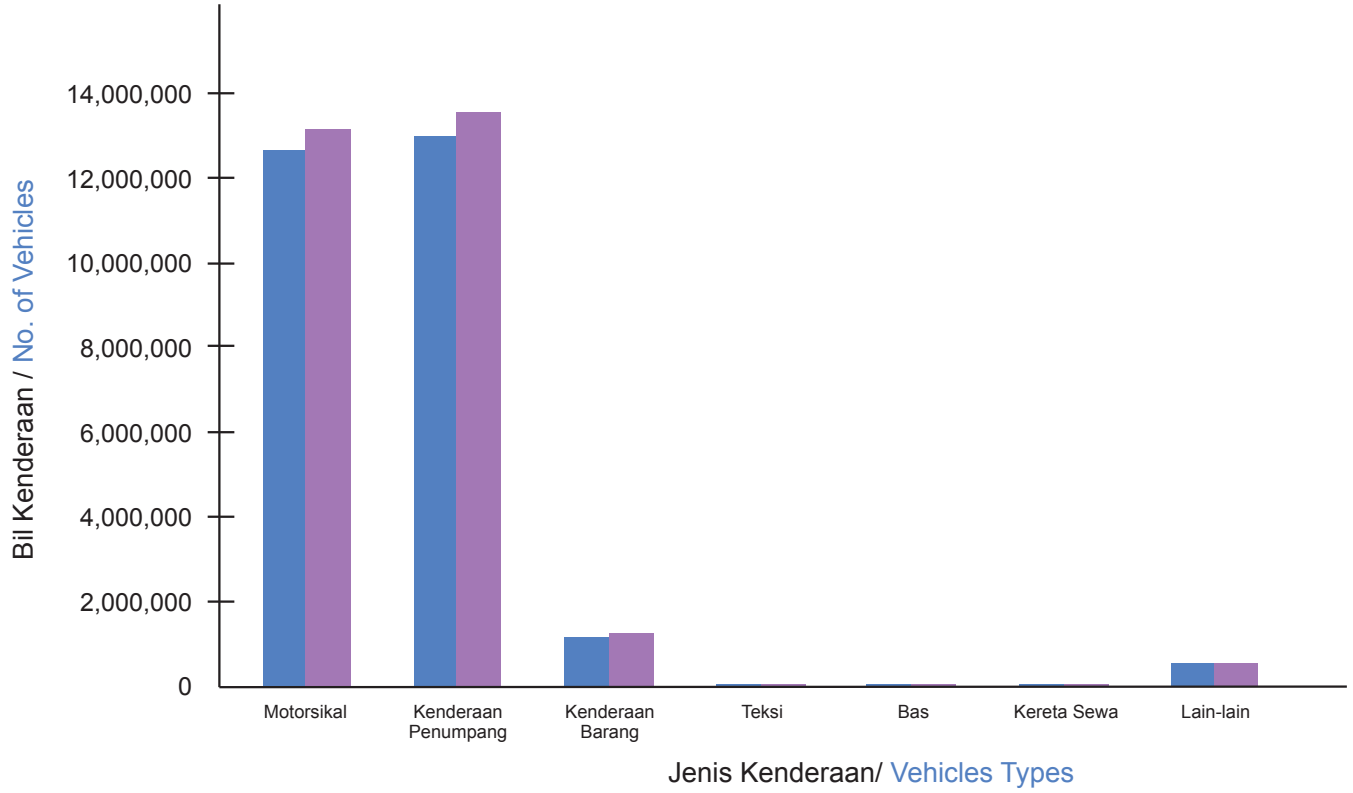
Pelepasan bunyi bising daripada kenderaan bermotor dikawal di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Bunyi Bising Kenderaan Bermotor) 1987.

Operasi penguatkuasaan bagi mengawal pelepasan bunyi bising dari motorsikal telah dilaksanakan oleh Pejabat-pejabat JAS negeri dengan kerjasama Polis DiRaja Malaysia (Cawangan Trafik). Pada 2017, sejumlah 5,921 buah motosikal telah ditahan bagi menjalani ujian pelepasan bunyi bising. Dari jumlah ini, 131 penunggang motosikal telah dikompaun oleh pihak polis kerana melanggar had bunyi bising yang dibenarkan. Peratus pematuhan secara keseluruhannya ialah 97.78% (**Rajah 4.9**) yang mana menurun 0.45% berbanding pada 2016.

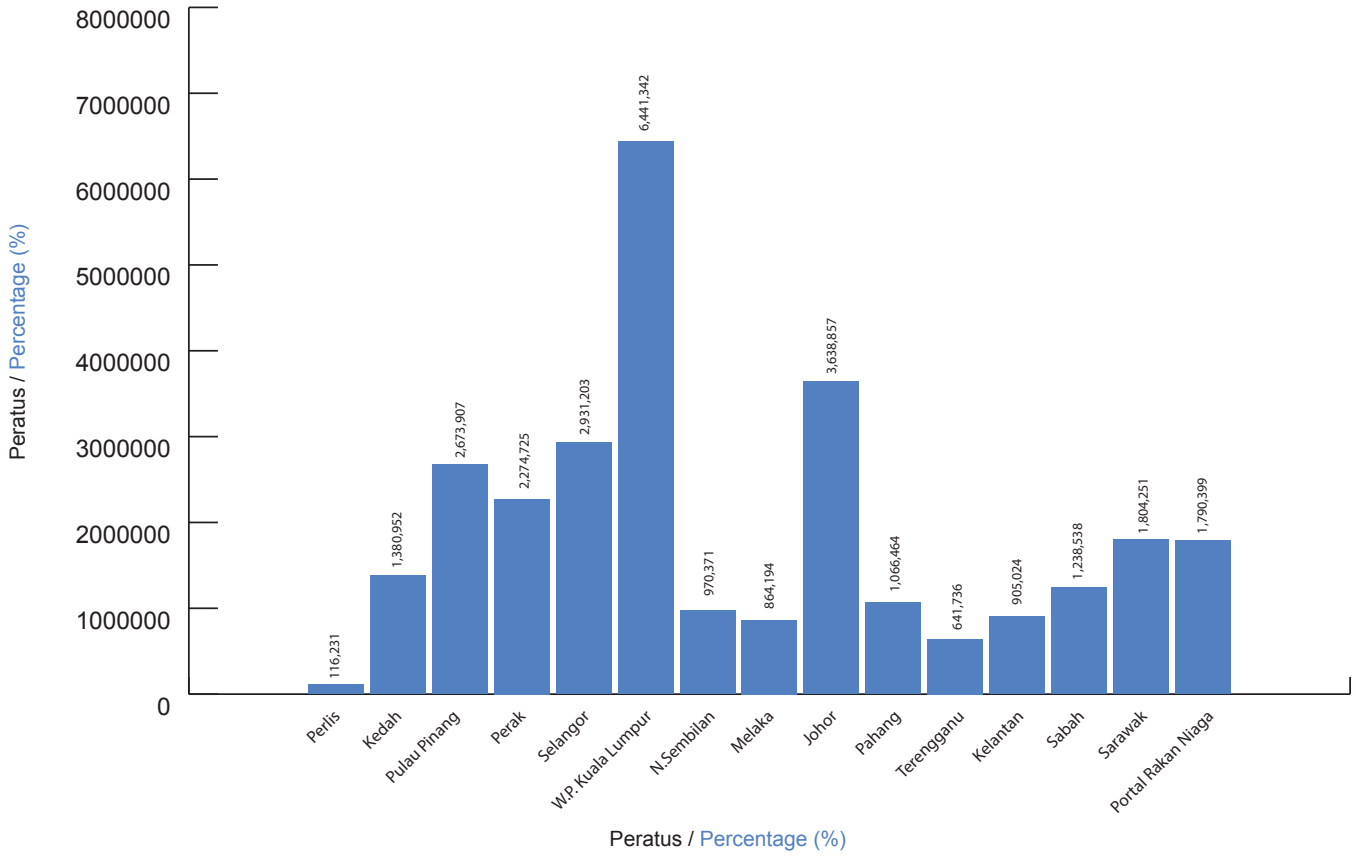
Noise from Motor Vehicles

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

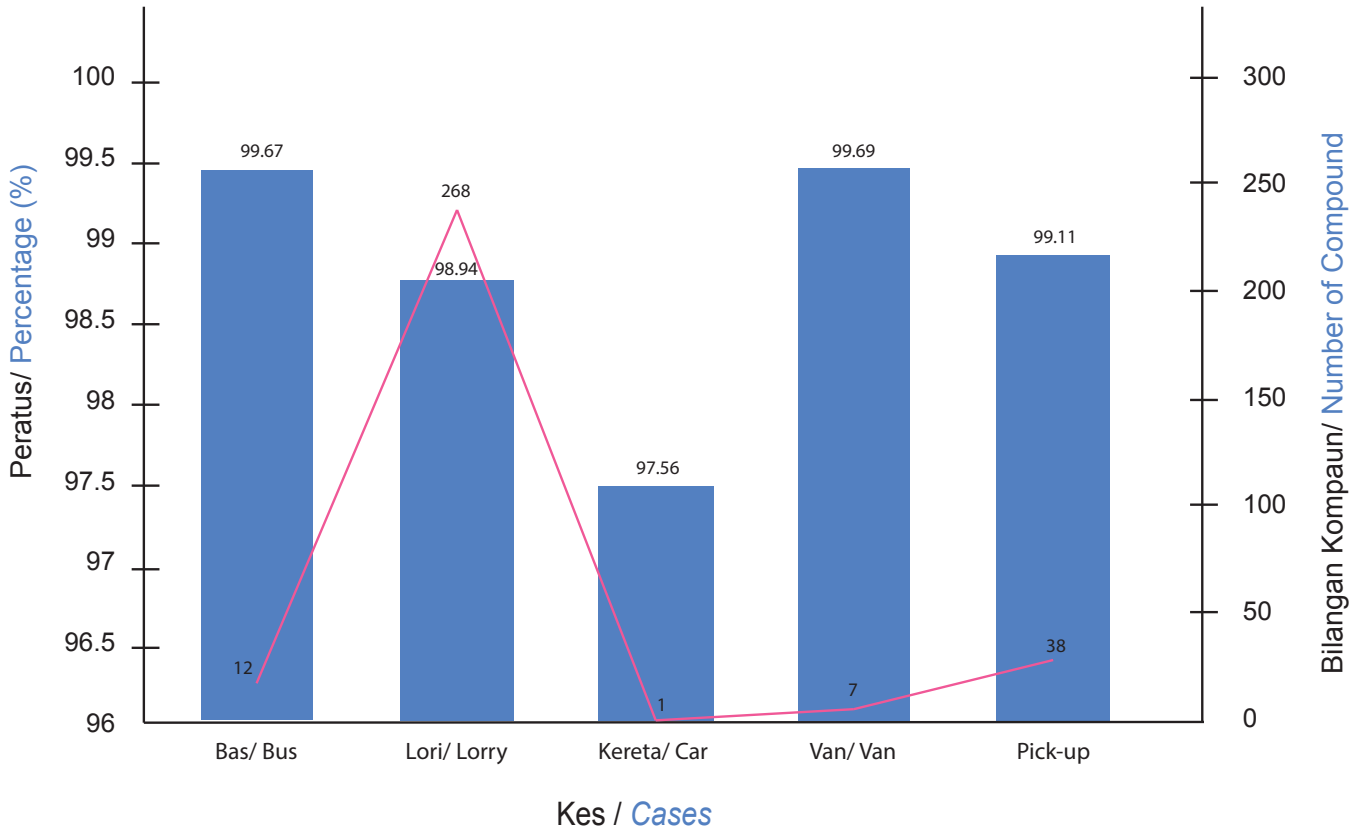
Enforcement operations to control excessive noise from motorcycles were jointly conducted by the DOE and the Traffic Police. In 2017, a total of 5,921 motorcycles were detained for the noise inspection. Out of this, 131 motorcyclists were summoned for violating the stipulated noise limits. The overall percentage of compliance is 97.78% (**Figure 4.9**) which is ana decrease of 0.45% compared to 2016.



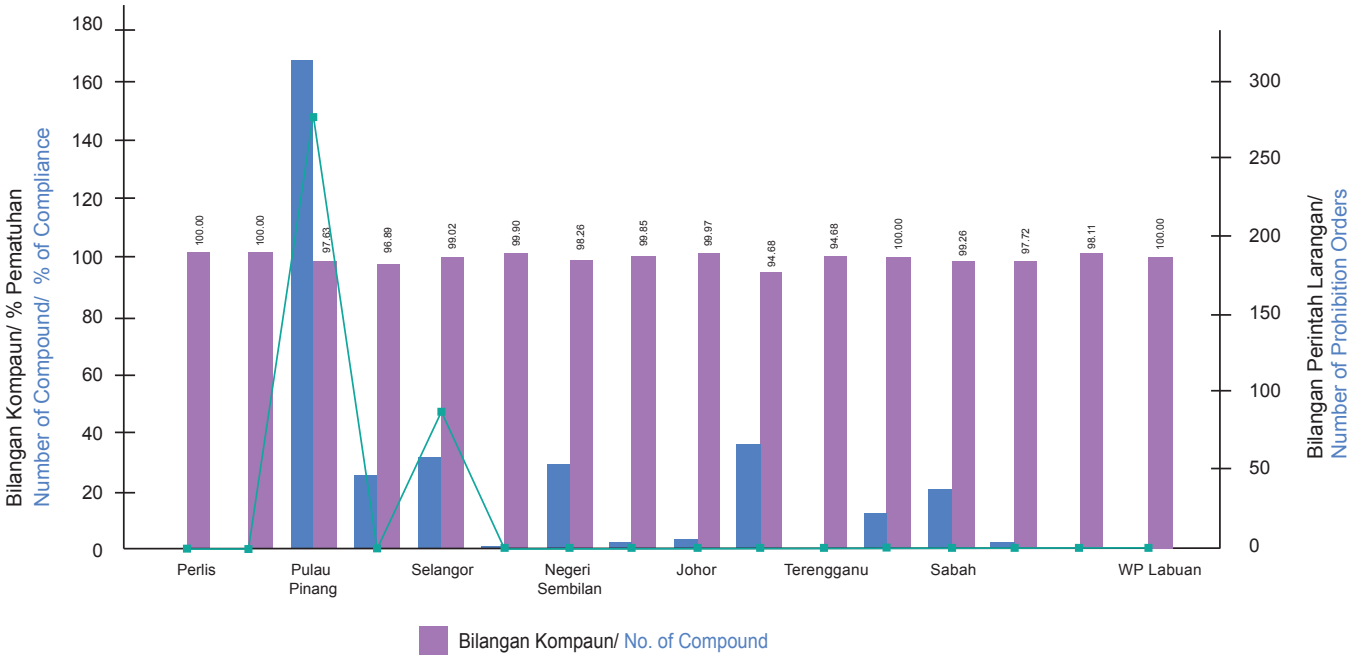
Rajah 4.5 JAS: Bilangan Kenderaan Bermotor Mengikut Jenis, 2017
(Sumber : Jabatan Pengangkutan Jalan, 2017)
Figure 4.15 DOE: Number of Motor Vehicles by Type, 2017
(Source : Road Transport Department, 2017)



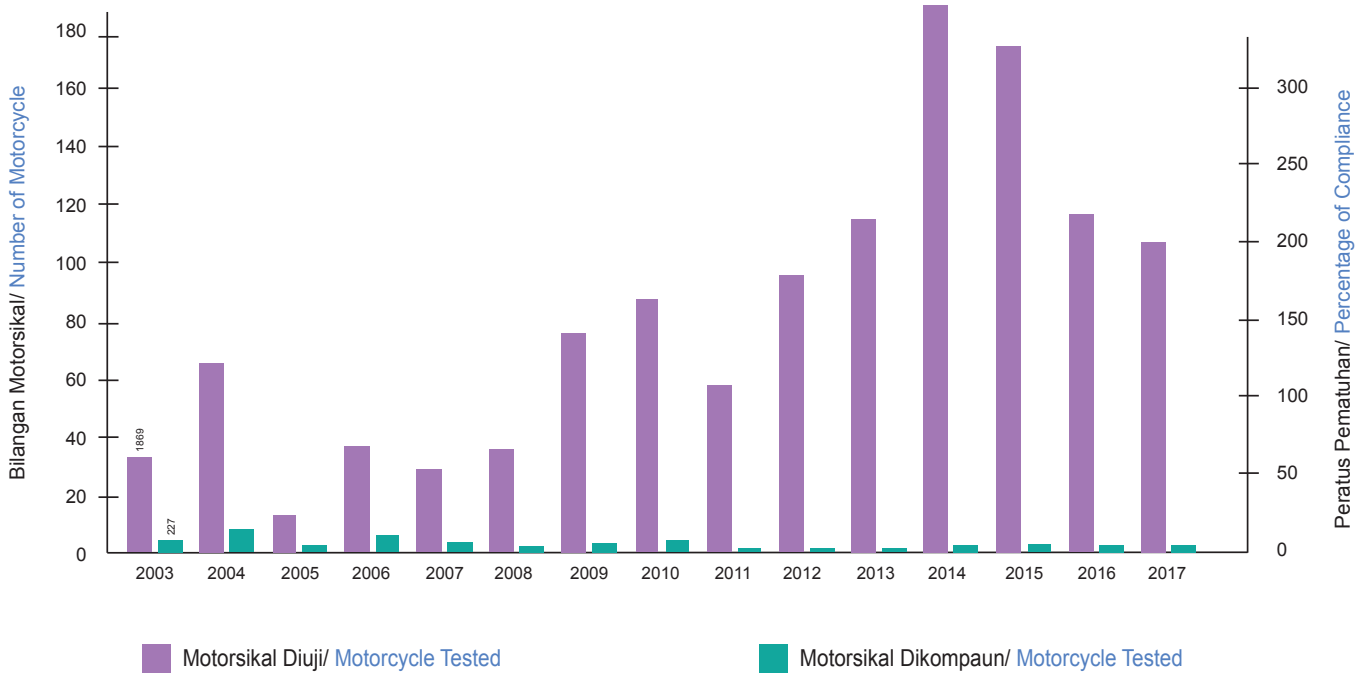
Rajah 4.6 JAS : Bilangan Kenderaan Bermotor Mengikut Negeri, 2016
Figure 4.16 DOE : No. of Vehicles By States, 2017



Rajah 4.7 JAS : Peratus Pematuhan Mengikut Jenis Kenderaan Dan Bilangan Kompaun, 2017
Figure 4.7 DOE : Percentage of Compliance, According To Type Vehicles And Number of Compound 2017



Rajah 4.8 JAS : Bilangan Kenderaan Dikompaun, Pengeluaran Perintah Larangan & Peratus Pematuhan, 2017
Figure 4.8 : Number of Vehicles Compounded, Number of Prohibition Orders Issued & Percentage of Compliance, 2017



Rajah 4.9 JAS : Peratus Pematuhan Bilangan Motorsikal Diuji dan Bilangan Kompaun (2001 - 2017)
Figure 4.9 DOE : Percentage of Compliance, Number Of Motorcycle Tested And Compound Issued (2001 - 2017)

PENGURUSAN BUANGAN TERJADUAL

Lesen Premis Yang Ditetapkan

Sejumlah 730 lesen dikeluarkan kepada kemudahan baru dan sediada pada tahun 2017 yang terdiri daripada 163 kemudahan pemerolehan kembali luar tapak (bukan e-waste), empat puluh (40) kemudahan pemerolehan kembali luar tapak (penuh e-waste), lapan puluh lapan (88) kemudahan pemerolehan kembali luar tapak (separa e-waste), empat puluh dua (42) kemudahan penunu buangan terjadual, satu (1) kemudahan buangan terjadual di tanah, tiga (3) kemudahan pengolahan luar tapak, enam (6) kemudahan tapak pelupusan selamat, dan lima puluh lima (55) kemudahan penstoran luar tapak. Sejumlah 332 lesen dikeluarkan kepada pembawa yang ditetapkan. **(Jadual 4.17).**

SCHEDULED WASTE MANAGEMENT

Licences for Prescribed Premises

A total number of 730 licenses were issued for both existing and new facilities in 2017 which consists of 163 licenses for off-site recovery (non e-waste), fourty (40) licenses for off-site full recovery plants (e-waste), eighty eight (88) licenses for off-site partial recovery plants (e-waste), fourty two (42) licenses for scheduled wastes incinerators, one (1) license for land treatment, three (3) licenses for off-site treatment, six (6) licenses for secured landfills and fifty five (55) licenses for off-site storage facilities. A total of 332 licenses were issued for prescribed conveyance **(Table 4.17).**

Jadual 4.17 JAS: Lesen-Lesen Yang Dikeluarkan Bagi Kemudahan Pemerolehan Kembali, Pengolahan & Pelupusan Buangan Terjadual Yang Diluluskan Oleh Jabatan Alam Sekitar, 2017

Table 4.17 DOE : Licences issued for recovery facilities processing wastes disposal approved by the Department of the Enviroment, 2017

JUMLAH LESEN DIKELUARKAN MENGIKUT NEGERI																		
BIL	KEMUDAHAN		JHR	KDH	KLN	MLK	N.S	PHG	PRK	PRS	PP	SBH	SRK	SLG	TRG	WP (KL)	WP (LAB)	JUMLAH
1	Pembawa Yang Ditetapkan / Prescribed Conveyance		56	20	2	21	18	5	25	1	45	9	32	83	4	5	6	332
	Penstoran Luar Tapak / Off Site Storage		8	1	1	1	2	2	2	0	0	6	21	4	0	0	7	55
2	Pemerolehan Kembali Luar Tapak / Off Site Recovery																	
	a.	Pemerolehan Kembali Luar Tapak (bukan e-Waste) / Off Site Recovery (none e-waste)	28	8	0	4	14	7	20	1	19	2	4	49	5	0	2	163
	b.	Pemerolehan Kembali Luar Tapak (penuh e-Waste) / Off Site Recovery (full e-Waste)	9	3	0	5	3	0	3	0	9	0	1	7	0	0	0	40
	c.	Pemerolehan Kembali Luar Tapak (separa e-Waste) /Off Site Recovery (partial e-Waste)	16	8	1	10	4	0	1	0	17	0	5	20	0	5	1	88
3	Penunu Buangan Terjadual / Schedule Waste Incinerator		7	2	0	0	3	1	4	0	3	3	12	4	2	0	1	42
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	0	0	0	0	0	1	3
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		126	43	4	42	46	15	55	2	93	20	76	167	12	10	19	730
	Bil. Premis / No. of Premises		70	23	2	21	18	10	30	1	48	11	44	84	8	5	13	388

NOTA:

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

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 menggunakan premis.

Kilang Getah Asli Mentah

Pada tahun 2017, sejumlah lima puluh lapan (58) buah kilang getah asli mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Getah Asli Mentah), 1978. Daripada jumlah ini, empat puluh empat (44) buah kilang telah dilesenkan bagi melepaskan efluen yang telah diolah ke alur air, sebuah (1) kilang telah dilesenkan untuk melepaskan effluen ke atas tanah, manakala tiga belas (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 4.10** menunjukkan bilangan kilang getah asli mentah mengikut negeri.

Pada tahun 2017 selari dengan Hala Tuju Baharu JAS, pegawai-pegawai penguatkuasa JAS Negeri telah menjalankan sejumlah empat puluh tujuh (47) pemeriksaan secara desktop dan lima puluh satu (51) pemeriksaan lapangan ke atas lima puluh lapan (58) buah kilang getah asli mentah yang telah dilesenkan.

Hala Tuju Baharu JAS yang diperkenalkan adalah melalui pendekatan *Self Regulation (SR)* sebagai pelengkap (*complement*) bagi kaedah *Command And Control (CAC)* 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 4.10.**

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 2017, there were fifty eight (58) raw natural rubber factories licensed under the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations, 1978. Out of these, fourty four (44) factories were licensed to discharge treated effluent into inland watercourse, one (1) was permitted to practise land disposal, while the remaining thirteen (13) were allowed to recycle their effluent. The licensing periods of these premises varies; less than one year for **Figure 4.10** shows the distribution of raw natural rubber factories according to states.

In 2017, in conjuction with DOE's new strategic plan, state DOE enforcement officers has conducted 47 dekstop inspection and 51 field inspection on 58 licensed raw natural rubber factories.

The DOE's new strategic plan is through Self Regulation (SR) approach as a complement to the Command And Control (CAC) method. Enforcement involve field inspection as well as dekstop inspection.

Those factories with low compliance record previously were given priority for inspections. Follow up actions taken as a result of these inspections are as shown in **Figure 4.10.**

Sejumlah satu (1)arahan lapangan dan dua puluh dua (22) notis arahan telah dikeluarkan kepada premis-premis tersebut supaya mengambil tindakan pembaikan bagi mematuhi keperluan perundangan. Tiada kompaun dikeluarkan dan tiada premis dalam tindakan mahkamah (**Rajah 4.11**).

A total of (1) field citations and twenty two (22) notices were issued to the concerned premises to take corrective actions in order to comply with the legal requirements. No compound was issued for the offences committed and no court action was taken (**Figure 4.11**).

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

Pada tahun 2017, pencapaian pematuhan keseluruhan kilang getah asli mentah yang tertakluk di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Getah Asli Mentah) 1978 adalah 98.3% bagi pemeriksaan dekstop dan 95.0% bagi pemeriksaan lapangan.

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

In 2017, the overall compliance performance by the raw natural rubber factories that were subjected to the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations, 1978 was 98.3% for deskstop inspection and 95.0% for field inspection.

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 2017, pencapaian pematuhan keseluruhan oleh kilang getah asli mentah adalah 97.4% bagi pemeriksaan desktop dan 95.1% bagi pemeriksaan lapangan.

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 2017, overall compliance performance by the raw natural rubber factories was 97.4% for desktop inspection and 95.1% for field inspection.

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

Pada tahun 2017, pencapaian pematuhan keseluruhan oleh kilang getah asli mentah bagi Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 adalah 100% bagi kedua-dua pemeriksaan desktop dan pemeriksaan lapangan.

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

In 2017, overall compliance performance by the raw natural rubber factories for the Environmental Quality (Scheduled Wastes) Regulations, 2005 was 100% for both dekstop inspection and field inspection.

Kilang Kelapa Sawit Mentah

Sejumlah 454 buah kilang kelapa sawit mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Kelapa Sawit Mentah), 1977 pada tahun 2017. Dari 454 buah kilang yang dilesenkan, 361 buah kilang telah dilesenkan bagi melepaskan efluen yang diolah ke dalam alur air, lapan puluh tujuh (87) buah kilang melupuskan efluen ke atas tanah, dua puluh dua (22) buah kilang melupuskan efluen dengan menggunakan gabungan kaedah alur air

Crude Palm Oil Mills

There were 454 palm oil mills licensed under the Environmental Quality (Prescribed Premises) (Crude Palm Oil Mill) Regulations, 1977 in the year 2017. Of these 454 licensed prescribed premises, 361 were granted permission to discharge treated effluent into inland watercourse, eighty seven (87) to practice land disposal, twenty two (22) to discharge effluent by combination into inland watercourse and land disposal. While, fourty five (45) to practice composting, thirty one

dan atas tanah. Manakala, empat puluh lima (45) buah kilang menggunakan kaedah kompos, tiga puluh satu (31) buah kilang menggunakan gabungan kaedah alur air dan kompos serta lapan (8) buah kilang menggunakan gabungan kaedah atas tanah dan kompos. **Rajah 4.11** menunjukkan taburan bilangan kilang kelapa sawit mentah di Malaysia mengikut negeri.

(31) to discharge treated effluent using a combination of inland watercourse and composting and the other eight (8) using a combination land disposal and composting. **Figure 4.12** shows the distribution of palm oil mills in Malaysia according to states.

Pada tahun 2017 selari dengan Hala Tuju Baharu JAS, pegawai-pegawai penguatkuasa JAS Negeri telah menjalankan sejumlah 378 pemeriksaan secara desktop dan 429 pemeriksaan lapangan ke atas 454 buah kilang kelapa sawit mentah yang telah dilesenkan.

In 2017, in conjuction with DOE's new strategic plan, state DOE enforcement officers has conducted 378 dekstop inspection and 429 field inspection on 454 licensed palm oil mills.

Hala Tuju Baharu JAS yang diperkenalkan adalah melalui pendekatan *Self Regulation (SR)* sebagai pelengkap (*complement*) bagi kaedah *Command And Control (CAC)* Kaedah pelaksanaan adalah melibatkan pemeriksaan di lapangan dan pemeriksaan desktop.

The DOE's new strategic plan is through Self Regulation (SR) approach as a complement to the Command And Control (CAC) method. Enforcement involve field inspection as well as dekstop inspection.

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 4.11.**

Those factories with low compliance record previously were given priority for inspections. Follow up actions taken as a result of these inspections are as shown in **Figure 4.11.**

Sejumlah lima (5) arahan lapangan dan 170 notis arahan telah dikeluarkan kepada premis-premis tersebut supaya mematuhi keperluan perundangan. Sebanyak enam puluh empat (64) kompaun dikeluarkan bagi kesalahan yang dilakukan. Manakala, lapan (8) tindakan mahkamah telah diambil bagi kegagalan mematuhi syarat-syarat lesen.

A total of five (5) field citations and 170 notices were issued to the mills to comply with the legal requirements. sixty four (64) compounds were issued for offences committed. While, eight (8) court actions were taken.

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

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

Pada tahun 2017, pencapaian pematuhan keseluruhan kilang kelapa sawit mentah yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Minyak Kelapa Sawit Mentah) 1977 adalah 93.1% bagi pemeriksaan dekstop dan 94.4% bagi pemeriksaan lapangan.

In 2017, the overall compliance performance by the crude palm oil mills that were subjected under the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977 was 93.1% for desktop inspection and 94.4% for field inspection.

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 tahun 2017, pencapaian pematuhan keseluruhan oleh kilang minyak kelapa sawit mentah adalah 96.0% bagi pemeriksaan desktop dan 97.8% bagi pemeriksaan lapangan.

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

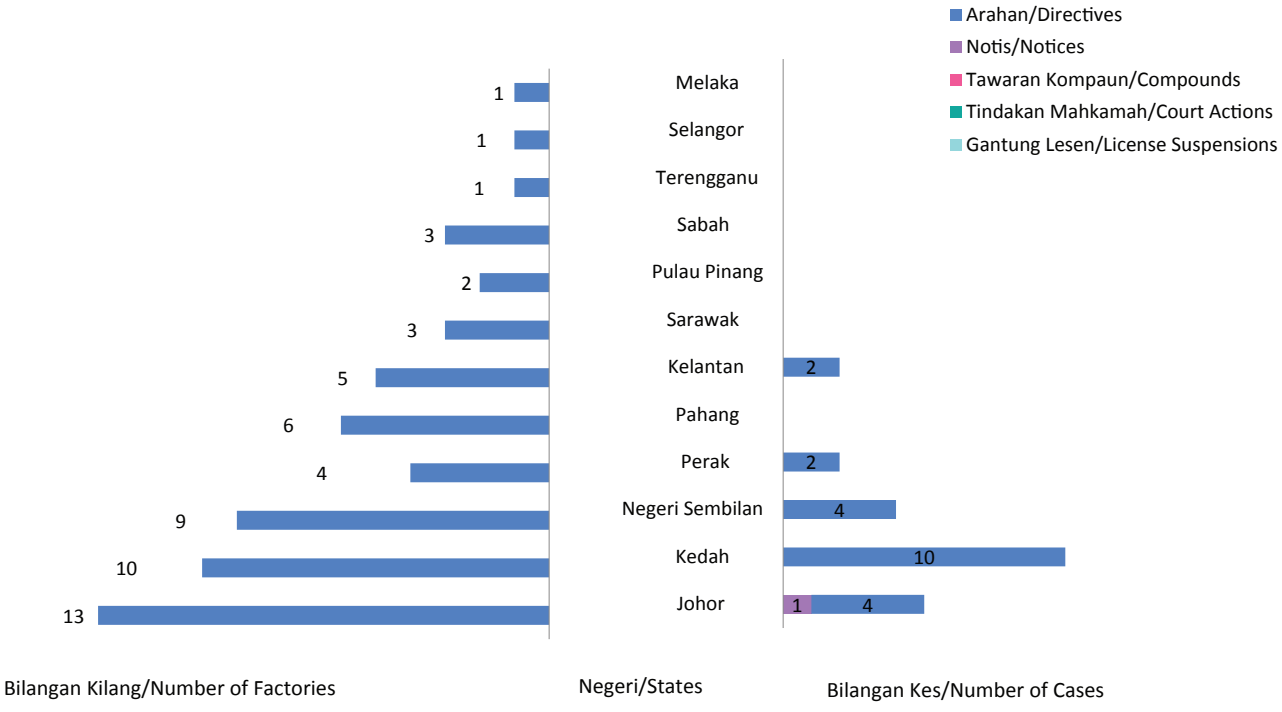
Palm oil mills are also subjected under the Environmental Quality (Clean Air) Regulations, 2014. In 2017, the overall compliance performance by palm oil mills was was 96.0% for desktop inspection and 97.8% for field inspection.

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

Pada tahun 2017 pencapaian pematuhan keseluruhan kilang minyak kelapa sawit di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 adalah 96.9% bagi pemeriksaan dekstop dan 95.8% bagi pemeriksaan lapangan.

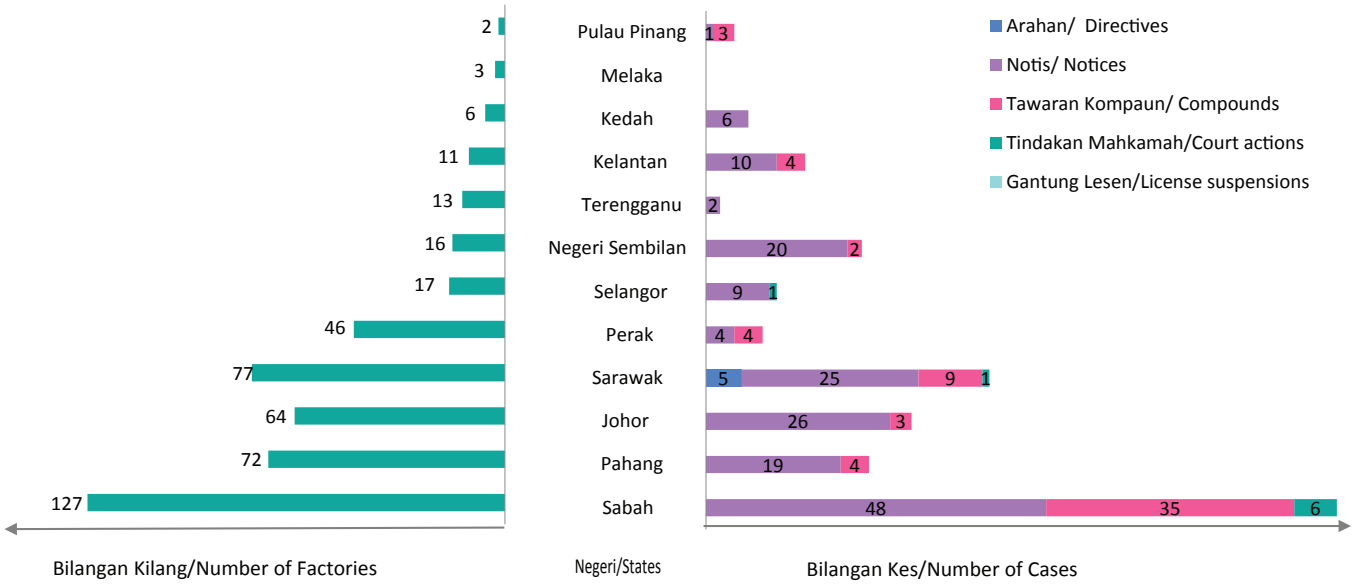
Status Of Compliance With The Environmental Quality (Scheduled Wastes) Regulations, 2005

In 2017, the overall compliance performance by the palm oil mills under the Environmental Quality (Scheduled Wastes) Regulations, 2005 was was 96.9% for desktop inspection and 95.8% for field inspection.



Rajah 4.10 JAS : Bilangan Kilang Getah Asli Mentah dan Tindakan Undang-Undang Terhadap Kilang Getah Asli Mentah , 2017

Figure 4.10 DOE : Raw Natural Rubber Factories and Legal Actions Against Raw Natural Rubber Factories, 2017



Rajah 4.11 JAS : Tindakan Undang-Undang Terhadap Kilang Minyak Kelapa Sawit Mentah, 2017

Figure 4.11 DOE : Legal Actions Against Crude Palm Oil Mills, 2017

KAWALAN TERHADAP 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 2017, sejumlah 10,280 pemeriksaan secara desktop dan 5,518 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.

Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 99.2% bagi kedua-kedua pemeriksaan dekstop dan pemeriksaan di lapangan. Terdapat 19 kategori industri mencapai pematuhan 100% pada tahun 2017 **(Rajah 4.12).**

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 98.8% bagi pemeriksaan desktop dan 98.9% bagi pemeriksaan lapangan. Terdapat 17 kategori industri mencapai pematuhan 100% pada tahun 2017 **(Rajah 4.13).**

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 98.2% bagi pemeriksaan desktop dan 98.3% bagi pemeriksaan lapangan. Antara kegagalan pematuhan yang direkodkan adalah termasuk gagal mengemukakan pemberitahuan mengenai

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 2017, DOE conducted 10,280 dekstop inspections and 5,518 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 overall compliance achievement by the non-prescribed premises was 99.2% for both dekstop and field inspection. There were 19 categories of industries achieved 100% compliance in 2017 **(Figure 4.12).**

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 98.8% for deskstop inspection and 98.9% for field inspection. There were 17 categories of industries achieved 100% compliance in 2017 **(Figure 4.13).**

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 98.2% for deskstop inspection and 98.3% 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

pengeluaran buangan terjadual kepada JAS, buangan terjadual tidak distor dan tidak dilabel dengan sempurna selain gagal menyimpan rekod inventori buangan terjadual dengan tepat dan terkini (Peraturan-Peraturan 3, 8, 9, 10 dan 11).

wastes beside failure to keep accurate and up-to-date inventory records of scheduled wastes (Regulations 3, 8, 9, 10 and 11).

Pada tahun 2017, terdapat 12 kategori industri mencapai pematuhan 100% terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 **(Rajah 4.14).**

In 2017, there were 12 categories of industries that were subjected under the Environmental Quality (Scheduled Wastes) Regulations, 2005 achieved 100% compliance **(Figure 4.14).**

Tindakan Penguatkuasaan

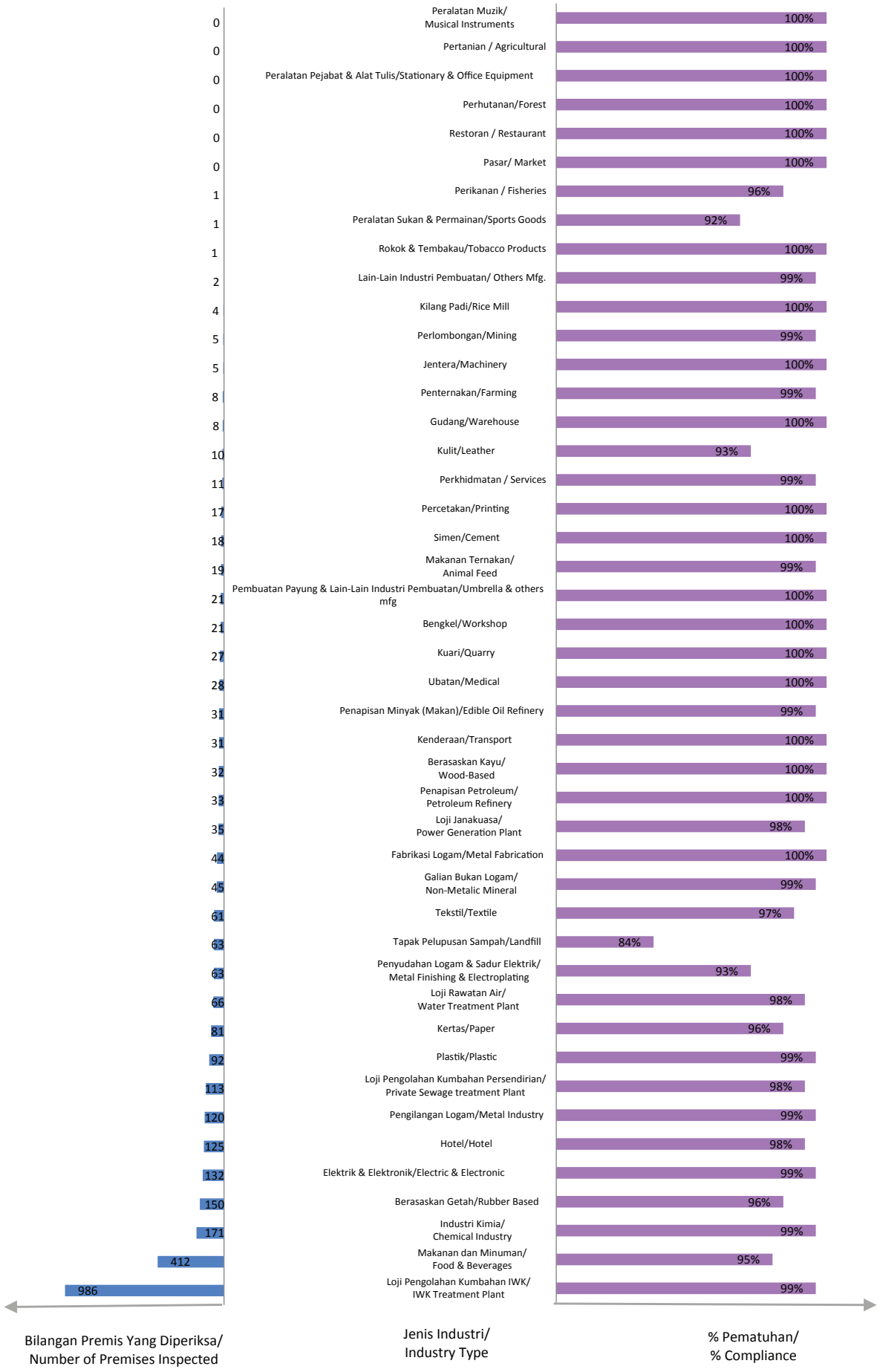
Enforcement Actions

Sejumlah 193 kes premis yang tidak patuh telah dituduh di mahkamah dengan RM 3,882,000 denda telah dipungut. Tindakan-tindakan penguatkuasaan lain yang diambil adalah pengeluaran 84 arahan lapangan, 2,014 notis arahan dan 2,017 kompaun kepada industri supaya mengambil tindakan yang sewajarnya bagi mematuhi Akta Kualiti Alam Sekeliling, 1974 dan 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.

A total of 193 cases of non-compliance premises were charged in courts with a fine of RM 3,882,000 collected. Other enforcement actions taken against the non-complying industries were issuance of 84 field citations, 2,014 notices and 2,017 compounds to industries for them to take appropriate actions in order to comply with the Environmental Quality Act, 1974 and the Environmental Quality (Industrial Effluents) Regulations, 2009, Environmental Quality (Clean Air) Regulations, 2014 and Environmental Quality (Scheduled Wastes) Regulations, 2005.

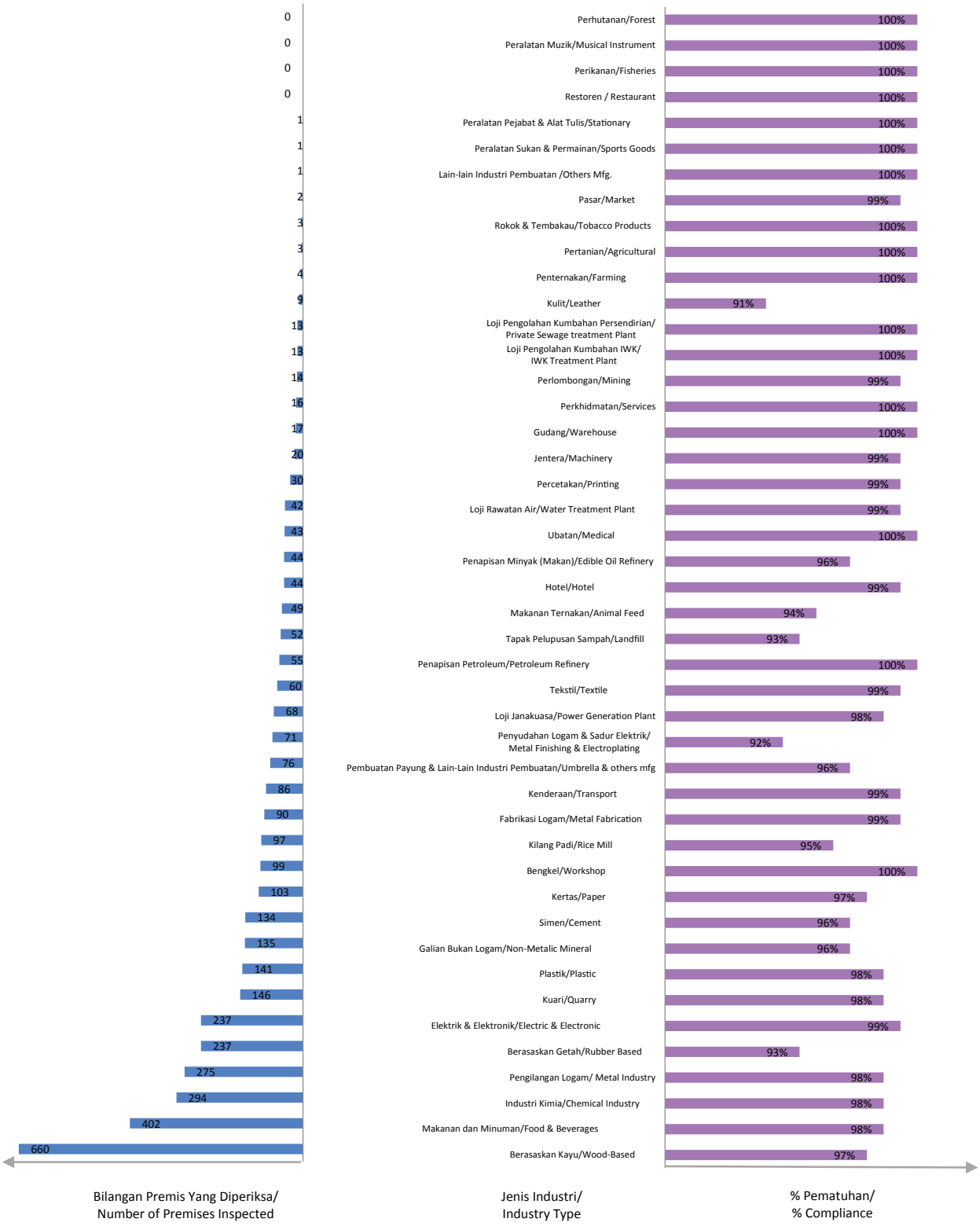
Bagi meningkatkan pematuhan kepada peraturan, JAS telah mengeluarkan arahan-arahan kepada industri supaya memasang alat kawalan pencemaran yang sesuai dan efisien, meningkatkan keupayaan kemudahan kawalan pencemaran yang sedia ada dan juga menyediakan jadual perancangan dan pelaksanaan sistem pengurusan 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. Jabatan Alam Sekitar juga dalam usaha memastikan pematuhan sepenuhnya, mempromosi penggunaan teknologi kawalan yang efisien, amalan pengeluaran bersih serta pematuhan kendiri. Pihak industri juga dinasihatkan untuk mewujudkan sistem pengurusan alam sekitar yang baik dan digalakkan untuk mendapatkan pensijilan ISO 14000.

In order to improve compliance to regulations, DOE has issued directives to the industries to install appropriate and efficient 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 implemented throughout the year for specific target groups. Such activities included dialogues, seminars and workshops for industries, with the aim of improving the level of regulatory compliance. The Department of Environment, in its 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 be ISO 14000 certified.



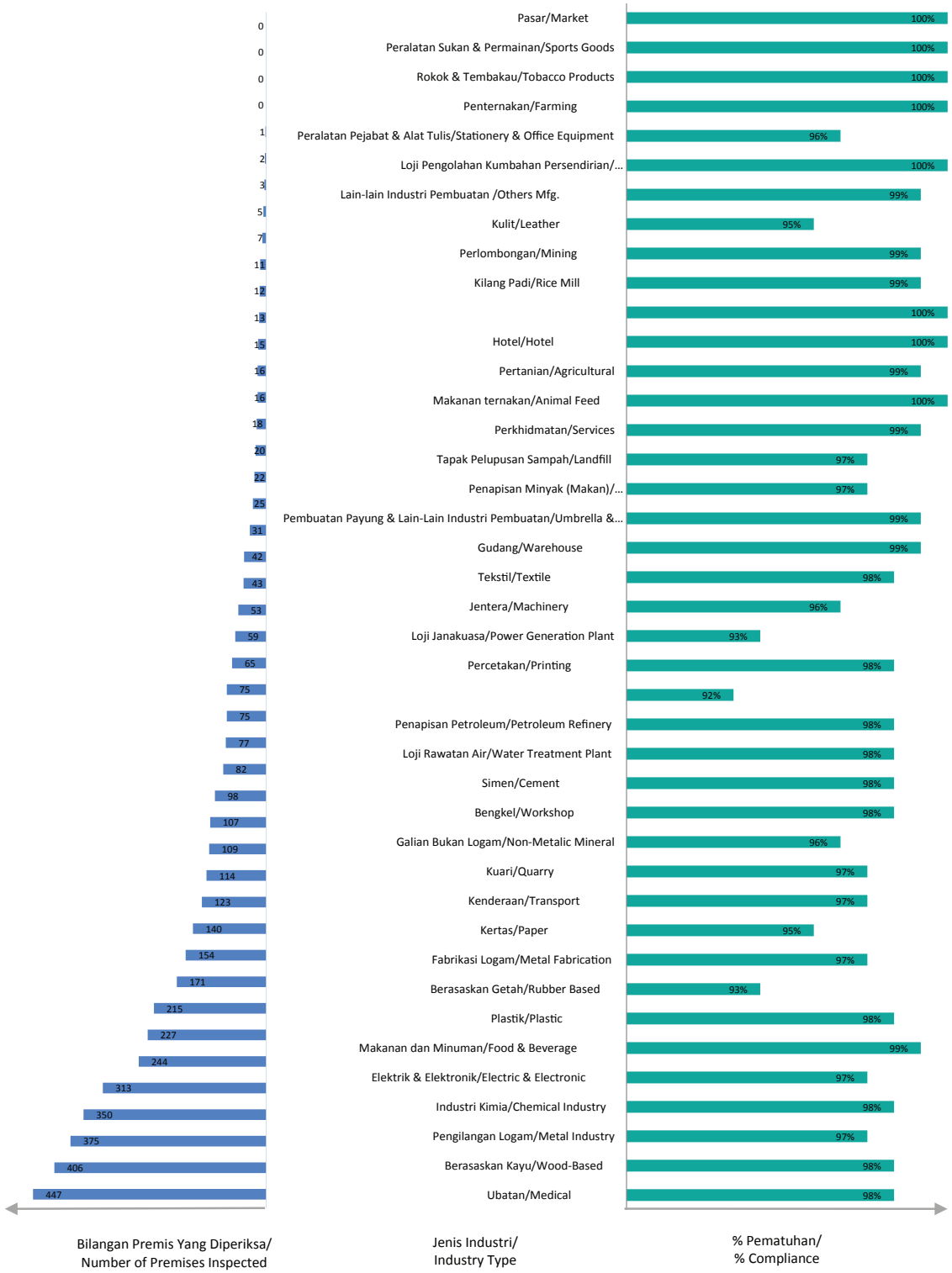
Rajah 4.12 JAS : Status Pematuhan Industri Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen) 2009, 2017

Figure 4.12 DOE : Compliance Status to the Environmental Quality (Effluent) Regulations 2009, 2017



Rajah 4.13 JAS : Status Pematuhan Industri Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 2014, 2017

Figure 4.13 DOE : Compliance Status to the Environmental Quality (Clean Air) Regulations 2014, 2017



Rajah 4.14 JAS : Status Pematuhan Industri Terhadap
Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005, 2017

Figure 4.14 DOE : Compliance Status to the Environmental Quality (Scheduled Wastes) Regulations 2005, 2017

TINDAKAN UNDANG-UNDANG

Pendakwaan

Pada tahun 2017, sejumlah 193 kes kesalahan di bawah Akta Kualiti Alam Sekeliling (AKAS) 1974 telah didakwa di mahkamah dengan denda yang dikenakan berjumlah RM 3,882,000.00 dan denda penjara selama 2 hari **(Rajah 4.15)**.

Daripada jumlah keseluruhan kes tersebut, sebanyak 73 (37.81%) kes mahkamah adalah melibatkan kesalahan di bawah Seksyen 16(1), Akta Kualiti Alam Sekeliling 1974 dengan jumlah denda sebanyak RM 953,500.00 Sebanyak 56 (29%) kes mahkamah melibatkan kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) dengan jumlah denda sebanyak RM 1,568,500.00 sementara 64 (33.2%) kes yang selebihnya melibatkan kesalahan - kesalahan lain di bawah AKAS 1974.

Kompaun

Sejumlah 1,910 kompaun telah dikeluarkan sepanjang tahun 2017 kepada premis dan syarikat untuk pelbagai kesalahan di bawah AKAS 1974. Pecahan mengikut kesalahan adalah seperti di **Rajah 4.16.**

LEGAL ACTION

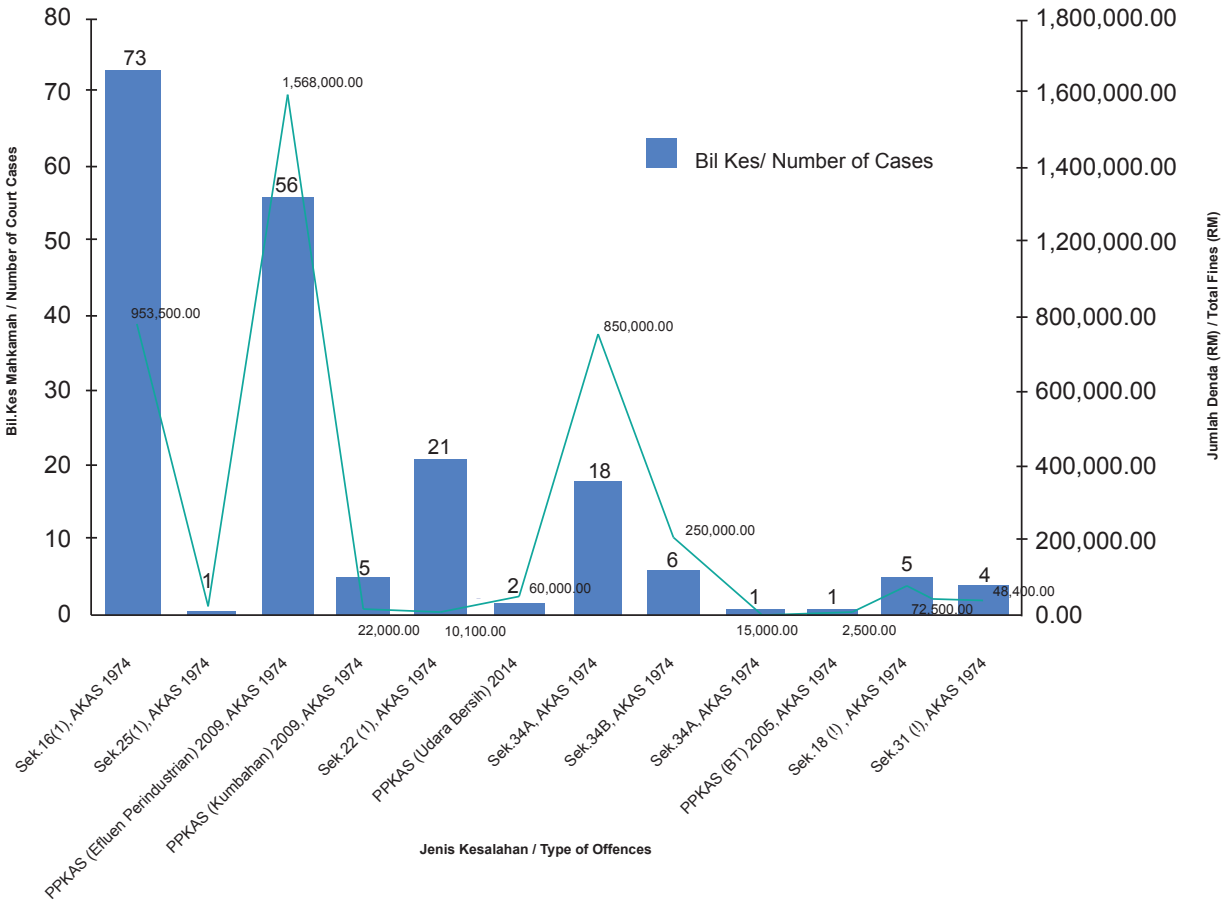
Prosecution

In 2017, a total of 193 offences were prosecuted under the Environmental Quality Act (EQA) 1974 with a total fine of RM 3,882,000.00 and imprisonment 2 days **(Figure 4.15)**.

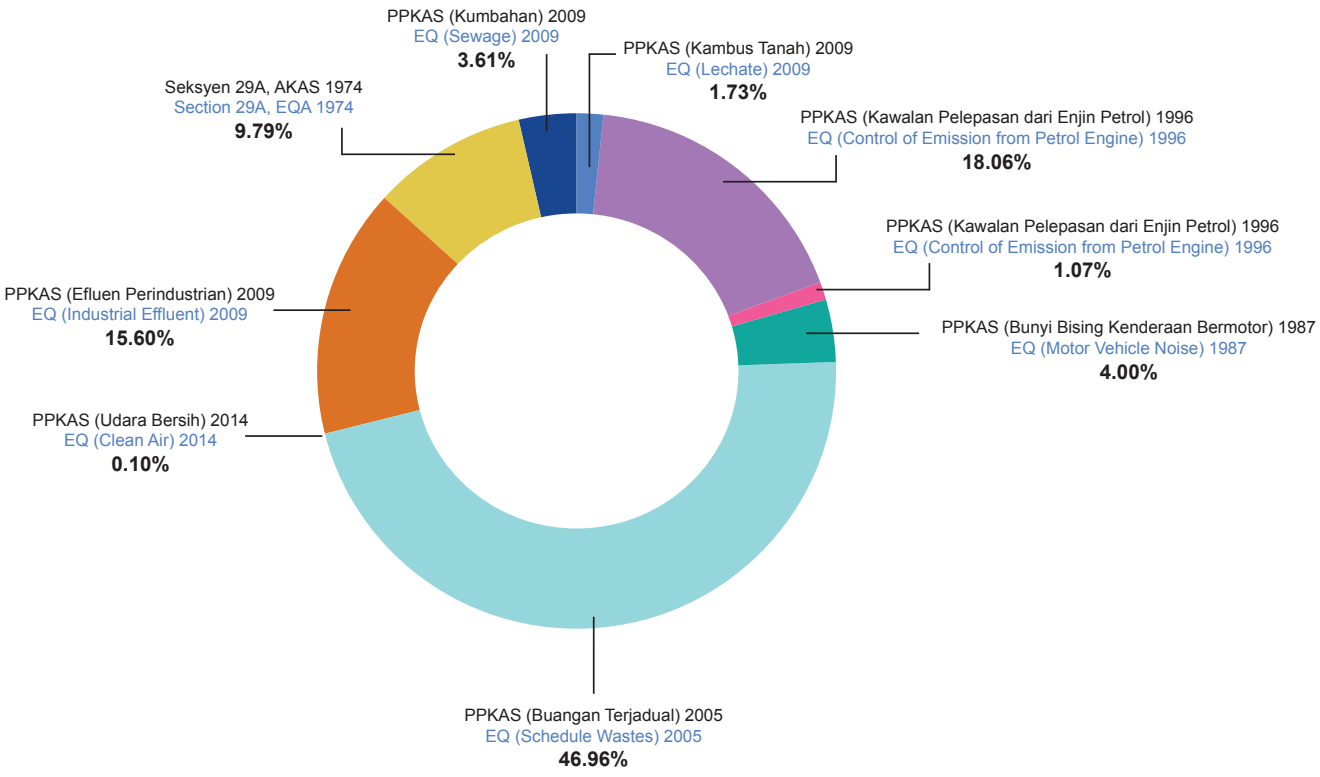
Out of this total, 73 (37.81%) court cases involved offences under Section 16(1), Environmental Quality Act (EQA) 1974 with a total fine of RM953,500.00. There were 56 (29%) court cases involved offences under Environmental Quality (Industrial Effluent) Regulations 2009 with a total fine of RM 1,568,500.00 while the remaining 64 (33.2%) cases were prosecuted for various other offences under the EQA 1974.

Compounds

A total of 1,910 compounds were issued in 2017 against premises and companies for various offences under the EQA 1974. Breakdown by offences is shown in **Figure 4.16.**



Rajah 4.15 JAS : Bilangan Kes Mahkamah dan Denda, 2017
Figure 4.15 DOE : Number of Court Cases and Fines, 2017



Jadual 4.16 JAS : Bilangan Kes Kompaun Mengikut Pecahan PPKAS, 2017
Table 4.16 DOE : Number of Compound Cases According to Environmental Quality Regulations, 2017

MAKLUMBALAS TERHADAP PENGADUAN AWAM

RESPONSE TO PUBLIC COMPLAINTS

Pada tahun 2017, sejumlah 5,563 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 bidang kuasa JAS dan telah dirujuk kepada agensi lain yang berkaitan untuk diambil tindakan. **(Rajah 4.17)**

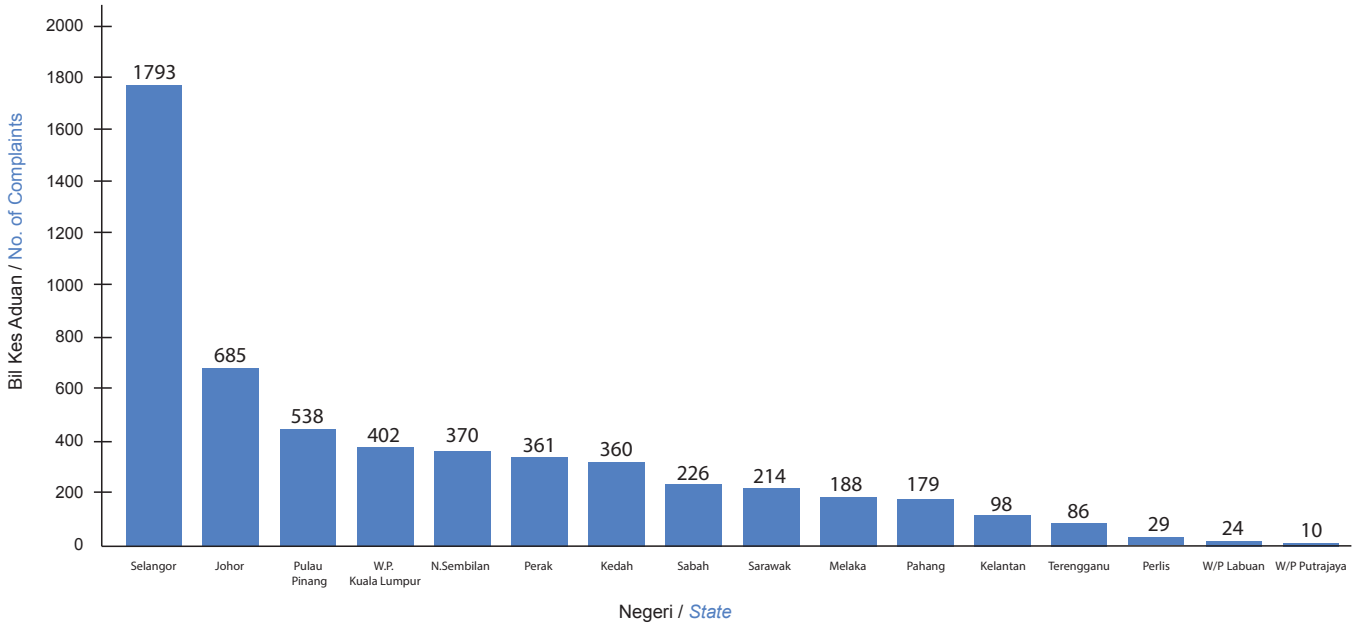
The Department of Environment received 5,563 environmental pollution complaints in the year of 2017. Out of these, 4,684 were under the Environmental Quality Act, 1974 and investigated by the State DOE Offices, while the remaining 879 cases were outside the jurisdiction of DOE and was referred to other relevant agencies. **(Figure 4.17)**

Pada tahun 2017, JAS Selangor menerima aduan yang tertinggi iaitu sebanyak 1,793 kes (31.4%), diikuti oleh JAS Johor sebanyak 685 kes (12%) dan JAS Pulau Pinang sebanyak 538 kes (9.4%). JAS Wilayah Persekutuan Putrajaya menerima aduan yang paling sedikit iaitu sebanyak 10 kes (0.2%) dan diikuti dengan JAS Wilayah Persekutuan Labuan iaitu sebanyak 24 kes (0.4%).

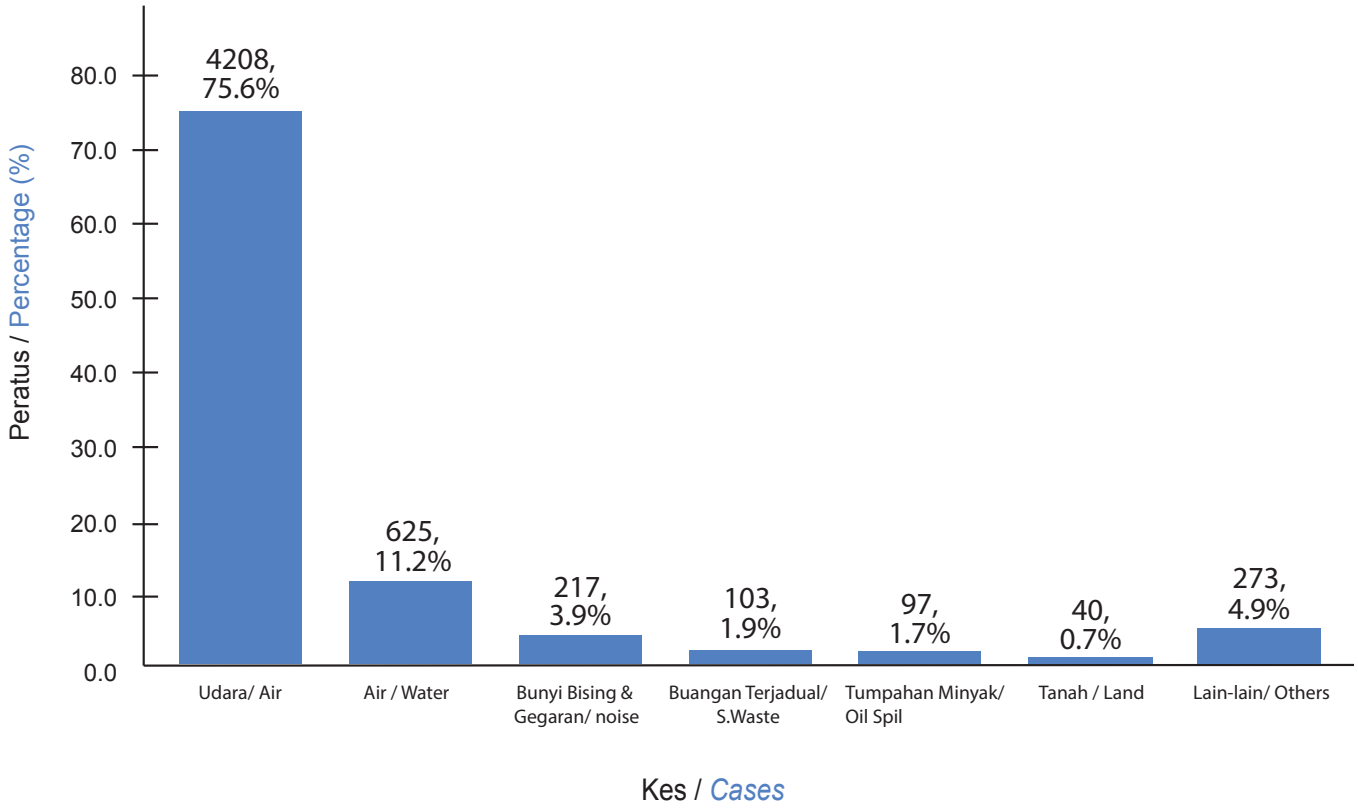
In the year 2017, DOE Selangor recorded 1,793 (31.4%) complaints, the highest number received, followed by DOE Johor 685 (12%) and DOE Pulau Pinang 538 (9.4%). DOE Federal Territory of Putrajaya recorded the least number of complaints received with 10 (0.2%) complaints and followed by DOE Federal Territory of Putrajaya 24 (0.4%).

Seperti tahun-tahun yang sebelumnya, bilangan aduan pencemaran yang tertinggi adalah berkaitan dengan pencemaran udara iaitu sebanyak 4,208 kes (75.6%), sebanyak 625 kes (11.2%) berkaitan pencemaran air, sebanyak 217 kes (3.9%) berkaitan pencemaran bunyi, sebanyak 103 kes (1.9%) berkaitan buangan terjadual, sebanyak 97 kes (1.7%) berkaitan tumpahan minyak, sebanyak 40 kes (0.7%) berkaitan pencemaran tanah dan sebanyak 273 kes (4.9%) lain-lain aduan **(Rajah 4.18)**.

As in the previous years, most of the complaints received were related to air pollution 4,208 (75.6%), followed by 625 (11.2%) water pollution, 217 (3.9%) noise pollution, 103 (1.9%) on illegal dumping of scheduled or toxic wastes, 97 (1.7%) oil spillage, 40 (0.7%) land pollution and 273 (4.9%) of other complaints **(Figure 4.18).**



Rajah 4.17 JAS : Bilangan Aduan Mengikut Negeri, 2017
Figure 4.17 DOE : Number of Complaints by State, 2017



Rajah 4.18 JAS : Bilangan Kes Aduan Mengikut Jenis, 2017
Figure 4.18 DOE : Number of Complaint Cases by Types, 2017

Lawatan Penguatkuasaan ke Premis Industri
Enforcement Visits to Industrial Premises

Lawatan ke LAB Jabatan Mineral dan Geosains (JMG) Perak
Site visit to Department of Mineral and Geoscience Perak LAB

Lawatan ke LAB *Forest Research Institute Malaysia (FRIM)*
Site visit to Forest Research Institute Malaysia LAB

Lawatan Kerja Dato' KPAS ke Premis Lotte Chemical Titan(M) Sdn Bhd
The visit of Director General DOE to Lotte Chemical Titan(M) Sdn Bhd

Lawatan Penguatkuasaan ke Tapak Pelupusan Sampah
Enforcement Visit to Landfill

Lawatan Penguatkuasaan ke Kilang Kelapa Sawit
Enforcement Visit to Palm Oil Mill

BAB 5
CHAPTER 5

PROGRAM RAKAN ALAM SEKITAR
RAKAN ALAM SEKITAR PROGRAMME

Program Rakan Alam Sekitar (RAS) yang dilancarkan pada 4 Jun 2009 telah mempunyai seramai 302,147 ahli berdaftar di seluruh Malaysia sehingga Disember 2017. 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.

Rakan Alam Sekitar programmes (RAS) was launched on 4th June 2009 and there have been 302,147 registered members until December 2017. Rakan Alam Sekitar (RAS) programmes involves members of the community on a hands-on basis that serves as an eye and ears to assist the government agencies in combating the activities that damage or pollute the environment.

Objektif Program Rakan Alam Sekitar adalah seperti berikut:

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

The objectives of Rakan Alam Sekitar Programme are as follows:

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

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:

i. Strategi baru dalam mendekatkan diri dengan masyarakat dalam mempromosi kesedaran alam sekitar.
ii. Mempromosi pendidikan dan kesedaran alam sekitar melalui medium mesra alam iaitu dengan cara berbasikal.
iii. Menyokong usaha kearah kelestarian alam sekitar dan mendekati golongan peminat berbasikal dalam mempromosi Rakan Alam Sekitar.

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:

i. A new strategy in bringing people closer to promote environmental awareness.
ii. Promoting enviromental education and awareness through eco-friendly medium.
iii. To support efforts towards environmental sustainability and to approach cycling enthusiasts in promoting Rakan Alam Sekitar.

Program Kayuhan Hijau di sekitar Putrajaya.
Kayuhan Hijau Programme Around Putrajaya

Enviro Hiking

Enviro Hiking merupakan satu aktiviti yang dijayakan bertujuan untuk memupuk semangat cintakan alam sekitar sambil beriadah. Pada tahun 2017, terdapat satu program Enviro Hiking yang dijalankan iaitu Enviro Hiking @Gunung Datuk, Rembau , Negeri Sembilan. 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 isitimewa turut diberikan kepada setiap pemenang

Enviro Hiking

Enviro Hiking is an activity that aims to inculcate environmental concern by doing leisure activity. In 2017, Enviro Hiking @Gunung Datuk, Rembau, Negeri Sembilan has been organised. 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 Datuk, Rembau, Negeri Sembilan.
Enviro Hiking Programme at Gunung Datuk, Rembau, Negeri Sembilan.

▶ Program Pameran Sempena Majlis Graduasi Dan Anugerah Kecemelangan SMK Clifford, Kuala Lipis, Pahang.
Exibition Programme in conjunction with the Graduation Ceremony and Excellence Award, SMK Clifford, Kuala Lipis, Pahang.

Pameran Alam Sekitar

Pada tahun 2017, Jabatan Alam Sekitar Ibu Pejabat telah menyertai sebanyak 31 pameran bertemakan alam sekitar yang dianjurkan oleh institusi - institusi pengajian tinggi, sektor perindustrian, swasta dan agensi kerajaan seperti **Jadual 5.1.**

Environmental Exhibitions

In 2017, the Department of Environment Headquarters has participated in 31 environmental exhibitions organized by Institutions of higher learning, industrial, private sector and government agencies as shown in **Table 5.1.**

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

BIL	PERKARA	PENGANJUR	LOKASI	TARIKH (2017)
1	Pameran sempena Majlis Pembukaan Tahun Perundangan 2017	Pejabat Ketua Pendaftar, Mahkamah Pesekutuan Malaysia	Dewan Plenari, PICC, Putrajaya	13 Januari
2	Pameran inovasi sempena Simposium Inovasi NRE	Kementerian Sumber Asli dan Alam Sekitar	FRIM, Kepong	19-21 Februari
3	Pameran untuk Kempen Keselamatan, Kesihatan dan Alam Sekitar	Pembinaan Mitrajaya Sdn Bhd	Lot 7G1, Putrajaya	20 Februari
4	Pameran Sempena Majlis Anugerah Pekrkhidmatan Cemerlang NRE 2016	Kementerian Sumber Asli dan Alam Sekitar	MAEPS	9 Mac
5	Pameran sempena Majlis Perasmian Sambutan Hari Air Sedunia 2017	NRE	Dataran Teluk Kemang, Port Dickson	25 Mac
6	Pameran Kesedaran Sempena Kempen Kesedaran Keselamatan dan Alam Sekitar	Sunway Construction Sdn Bhd	Parcel F, Putrajaya	27 dan 28 Mac
7	Pameran sempena program Singgah Santai @ PNM#Relakslah Dulu	Perpustakaan Negara Malaysia	Perpustakaan Negara Malaysia	25 Mac
8	Pameran sempena sesi Townhall bersama pihak industri dan persatuan berhubung Rang Undang-Undang Perkhidmatan Penyelenggaraan dan Pembaikan Kenderaan Motor	KPDNKK	Dewan Serbaguna Aras G, KPDNKK Putrajaya	21 Mac
9	Pameran sempena Majlis Pelancaran Program “Teenagers Engagement Towards Environment & Nature-Adopt A School”	Sultan Ahmad Shah Environment Trust (SASET)	Dewan Kolej Vokasional Sultan Haji Ahmad Shah Al- Mukhtasain Billah	29 Mac
10	Pameran sempena Karnival Ulang tahun ke-25 IKIM	Institut Kefahaman Islam Malaysia (IKIM)	Institut Kefahaman Islam Malaysia (IKIM),	31 Mac – 2 April
11	Pameran sempena mesyuarat Ketua setiausaha Negara bersama Ketua Setiausaha Kementerian	Jabatan Perdana Menteri	Dewan JPM, Putrajaya	5 April
12	Pameran Sempena Majlis Graduasi dan Anugerah Kecemerlangan SMK Clifford	SMK Clifford, Kuala Lipis, Pahang	SMK Clifford, Kuala Lipis, Pahang	8 April
13	Pameran Sempena Perhimpunan Bulanan NRE	JAS Ibu Pejabat	Dewan Biduri, JAS Ibu Pejabat	11 April
14	Pameran Sempena Sambutan Hari Bumi 2017	Bahagian Komunikasi Strategik, JAS Ibu Pejabat	Dataran Ledang, Johor	22 April
15	Pameran Sempena Majlis Pelancaran Hydrochlorofluorocarbon Phase-Out Management Plan (HPMP) Stage II	Bahagian Udara, JAS Ibu Pejabat	Hotel Saujana, Subang	8 Mei
16	Pameran sempena Program Transformasi Nasional 2050 (TN50)	Kementerian Sumber Asli dan Alam Sekitar	Universiti Malaysia Pahang	11 Mei

BIL	PERKARA	PENGANJUR	LOKASI	TARIKH (2017)
17	Pameran sempena Kempen Keselamatan dan Kesihatan di The Italian Baker	The Italian Baker Sdn Bhd	The Italian Baker Sdn Bhd, Pulau Indah,	18 Mei
18	Pameran bagi Program Hari Biodiversiti	Kementerian Sumber Asli dan Alam Sekitar	Taman Gelora, Kuantan	20 Mei
19	Pameran Sempena Program Kempen Keselamatan Kebakaran 1 Rumah 1 Alat Pemadam Api – Sambutan Hari Anggota Bomba	Jabatan Bomba dan Penyelamat Malaysia	Pusat Kejiranan Presint 9, Putrajaya	20 Mei
20	Pameran Alam Sekitar Sempena Majlis Pelancaran Sekolah Lestari	Sekolah Menengah Kebangsaan Tun Mutahir	Sekolah Menengah Kebangsaan Tun Mutahir, Melaka	8 Mei
21	Pameran sempena HSE	Syarikat Pembinaan Anggerik Sdn Bhd	Presint 14, Putrajaya	10 Ogos
22	Pameran sempena Program Safety Explorail 2017 K.I.S.S “Keep It Safe and Sound”	Rapid Rail Sdn Bhd	Ara Damansara	22 Julai
23	Pameran bagi seminar “OSHE Management System: A Stakeholders Policies And Management System As A Tool”	NIOSH Certification Sdn Bhd	The Waterfront Hotel, Kuching Sarawak	31 Julai
24	Pameran sempena 37th International Association for Hydro Environment Engineering and Research (IAHR) World Congress	NAHRIM, JPS, USM dan IAHR	PWTC, KL	13-18 Ogos
25	Pameran Rakan Alam Sekitar	JAS	Tesco Bandar Puteri, Bukit Mahkota, Bangi	29 September
26	Pameran Rakan Alam Sekitar sempena Hari Ozon	Seksyen Pelindungan Ozon, Bahagian Udara, JAS	Hotel Pullman, Putrajaya	5 Oktober
27	Pameran Rakan Alam Sektiar sempena program Lan Berambeh Anak Sarawak 2017	Persatuan Anak Sarawak Semenanjung	PWTC, KL	6 Oktober
28	Pameran Rakan Alam Sekitar sempena “Environmental Quality Monitoring Programme” (EQMP)	Bahagian Udara, JAS	Bahagian Udara, JAS	10 Oktober
29	Pameran sempena Hari Alam Sekitar Negara 2017	Jabatan Alam Sekitar Ibu Pejabat	D’Tempat Country Club, Bandar Sri Sendayan	21 Oktober
30	Pameran bergerak bagi mini Konvensyen Combi Tapak Bina WP Putrajaya 2017	Perbadanan Putrajaya	Dewan Sri Siantan, Perbadanan Putrajaya	8 November
31	Pameran Rakan Alam Sekitar	Bahagaian Komunikasi Strategik, JAS	Giant Hypermarket, Klang	9 November
32	Pameran Rakan Alam Sekitar	Bahagaian Komunikasi Strategik, JAS	Giant Hypermarket, Klang	11 November

HARI ALAM SEKITAR NEGARA 2017
NATIONAL ENVIRONMENT DAY 2017

HASN merupakan penjenamaan semula daripada Minggu Alam Sekitar Malaysia (MASM) yang telah disambut buat julung kalinya pada 22 Oktober 2016. Penganjuran sambutan HASN/ MASM oleh Kementerian Sumber Asli dan Alam Sekitar melalui Jabatan Alam Sekitar ini telah diadakan pada setiap tahun bermula pada tahun 1991 dan penjenamaan semula ini adalah selaras dengan usaha ke arah mentransformasikan program kesedaran alam sekitar kepada masyarakat awam bagi mendapatkan impak yang lebih besar. Penjenamaan semula ini adalah bertujuan untuk mengajak seluruh masyarakat agar sama-sama meraikan semangat kecintaan kepada alam sekitar. Objektif HASN adalah:

(i) Mempromosikan pendidikan dan kesedaran alam sekitar secara meluas
(ii) Menyediakan `platform' kepada warga Malaysia untuk bersama-sama menghayati alam sekitar
(iii) Mengiktiraf kepada mereka yang telah memberi sumbangan dan jasa kepada pemeliharaan dan pemuliharaan alam sekitar
(iv) Memupuk kesedaran di kalangan masyarakat khususnya dalam pemeliharaan dan pemuliharaan alam sekitar

Sambutan HASN menyasarkan pelbagai lapisan masyarakat seperti kanak-kanak tadika, sekolah, institusi pengajian tinggi (IPT), badan-badan bukan kerajaan (NGO), komuniti setempat, agensi kerajaan dan swasta, industri dan orang awam.

The National Environment Day (HASN) is a re-branding of the Malaysian Environment Week (MASM) and it has been celebrated for the first time on 22nd October, 2016. The celebration of MASM has been organized annually by the Ministry of Natural Resources and Environment through the Department of Environment since 1991 and this re-branding is in line with the efforts made towards transforming the environmental awareness program to gain greater impact to the public. This re-branding is aimed at bringing the whole community to celebrate the spirit of love for the environment. The objectives of HASN are:

(i) To promote education and environmental awareness in a broader aspect
(ii) To provide a platform to all Malaysians in celebrating and appreciating the environment
(iii) To give recognition to those who have contributed towards the preservation and conservation of the environment
(iv) To increase public awareness towards the preservation and conservation of the environment

The celebration of HASN targets various levels of society such as kindergartens, schools, institutions of higher learning (IPTs), non-governmental organizations (NGOs), local communities, government and private agencies, industries and the public.

Sebagai simbolik kepada bermulanya sambutan HASN, satu program Pra-Pelancaran HASN 2017 telah diadakan pada 16 Oktober 2017 di Port Dickson, Negeri Sembilan. Majlis tersebut telah disempurnakan oleh YB Datuk Ir. Dr. Haji Hamim bin Samuri, Timbalan Menteri Sumber Asli dan Alam Sekitar. Aktiviti pengisian kepada program tersebut adalah Sesi Menandatangani Memorandom of Understanding (MoU) - Rakan Strategik Alam Sekitar antara Jabatan Alam Sekitar dan Tenaga Nasional Berhad (TNB), aktiviti gotong-royong pembersihan pantai dan seminar pengurusan buangan terjadual. Program tersebut telah dihadiri oleh lebih kurang 400 orang peserta yang terdiri daripada pihak agensi kerajaan negeri dan persekutuan, industri dan pelajar institusi pengajian tinggi.

Pre-Launching of HASN was held on 16th October, 2017 in Port Dickson, Negeri Sembilan. The ceremony was officiated by YB Datuk Ir. Dr. Haji Hamim bin Samuri, Deputy Minister of Natural Resources and Environment. The activities include the Signing Session of Memorandom of Understanding - Environmental Strategic Partnership between the Department of Environment and Tenaga Nasional Berhad (TNB), coastal cleanup activities and scheduled waste management seminar. It was attended by approximately 400 participants comprising of state and federal government agencies, industry and students of higher learning institutions.

Sambutan HASN pada tahun 2017 telah dianjurkan secara serentak di seluruh Negara pada 21 Oktober 2017 dengan tema 'Alam Sekitar Tanggungjawab Bersama'. Sambutan HASN 2017 Peringkat Kebangsaan telah diadakan di d'Tempat Country Club, Bandar Sri Sendayan, Negeri Sembilan dan telah dirasmikan oleh YAB Dato' Seri Utama Haji Mohamad Bin Haji Hasan, Menteri Besar Negeri Sembilan. Majlis perasmian tersebut juga dimeriahkan dengan penyampaian Anugerah Sekolah Lestari Anugerah Alam Sekitar (SLAAS) Peringkat Kebangsaan 2017/2018 yang melibatkan 14 buah sekolah dari seluruh Malaysia dan Anugerah Khas Hari Alam Sekitar Negara 2017 (Bandar Lestari) dengan pemenang seperti di **Jadual 5.2.**

The HASN celebration in 2017 was held simultaneously throughout the country on 21st October, 2017 with the theme 'Environment is Our Responsibility". The National Level of HASN 2017 celebration was held at the d'Tempat Country Club, Bandar Sri Sendayan, Negeri Sembilan and was officiated by YAB Dato 'Seri Utama Haji Mohamad Bin Haji Hasan, the Chief Minister of Negeri Sembilan. The main highlights of the Opening Ceremony were the presentation of the Anugerah Sekolah Lestari Anugerah Alam Sekitar (SLAAS) Peringkat Kebangsaan 2017/2018, involving 14 schools from Malaysia and the National Environment Day (HASN) Special Award 2017 (Sustainable City). The winners for the HASN Special Award 2017 are as in **Table 5.2.**

Selain itu, program pengumpulan buangan elektrik dan elektronik isi rumah yang telah mula dijalankan pada awal Oktober 2017 di lokasi-lokasi terpilih di Negeri Sembilan bersempena HASN 2017 Peringkat Kebangsaan telah mendapat pengiktirafan Malaysia Book of Records sebagai program pengumpulan household e-waste yang terbanyak dengan jumlah terkumpul 60,704.65 kg.

The collection of electrical and electronic waste from household program has been initiated in early October 2017 at selected locations in Negeri Sembilan in conjunction with the National Level of HASN 2017. The accumulated e-waste was 60,704.65 kg and has been recognized as the largest household e-waste collection program by the Malaysia Book of Records.

Pelbagai aktiviti menarik diadakan semasa sambutan HASN 2017 Peringkat Kebangsaan, antaranya adalah pertandingan rekacipta, acara senamrobik, acara larian `Cenviro Green Run', pertandingan mewarna alam sekitar, pemeriksaan kesihatan, gigi dan kempen derma darah, kempen pencegahan kebakaran `Kid Fire Marshall', cabutan bonanza (Enviro – BSN SSP Bonanza) dan pameran alam sekitar. Program ini telah dihadiri oleh lebih 5000 pengunjung daripada pelbagai peringkat masyarakat.

Various activities were organized during the celebration of National Level HASN 2017 including inventions competition, aerobics, 'Cenviro Green Run' running event, environmental coloring contest, health screening, dental and blood donation campaign, fire prevention campaign - Kid Fire Marshall, bonanza draw (Enviro - BSN SSP Bonanza) and environmental exhibition. The program was attended by more than 5000 visitors from various levels of society.

Pelbagai aktiviti lain turut diadakan bersempena dengan HASN 2017, antaranya adalah bacaan khutbah Jumaat, sesi temubual melalui radio dan televisyen dan Pertandingan Melukis Komik Alam Sekitar. Selain itu, program Forum Perdana Ehwal Islam (Alam Sekitar) juga telah diadakan di Dewan Tuanku Canselor, Universiti Sains Islam Malaysia (USIM) pada 28 Oktober 2017 dengan tajuk 'Cinta Dunia' dan 'Ku Lihat Hijau'.

Other activities were also held in conjunction with the HASN 2017, among them were the interview sessions via radio and television and the Environmental Comics Drawing Competition. In addition, the Forum Perdana Ehwal Islam (Environment) program was also held at Dewan Tuanku Canselor, Universiti Sains Islam Malaysia (USIM) on 28th October, 2017 with the title of 'Cinta Dunia' and 'Ku Lihat Hijau'.

Penganjuran sambutan HASN 2017 telah mendapat kerjasama dan sokongan padu dari Kerajaan Negeri serta semua agensi kerajaan di peringkat Negeri dan Persekutuan serta Rakan Strategik Alam Sekitar. Komitmen dari semua pihak dalam menjayakan penganjuran sambutan HASN 2017 menunjukkan semangat perpaduan ke arah melestarikan alam sekitar secara bersama.

The execution of HASN 2017 celebration has received strong cooperation and support from the State Government and all government agencies at the State and Federal level as well as Environmental Strategic Partners. The commitment that has been given by all parties contribute to the success of the HASN 2017 celebration and it shows the spirit of unity towards conserving the environment.

- Sambutan HASN 2017 Peringkat Kebangsaan telah dirasmikan oleh YAB Dato' Seri Utama Haji Mohamad Bin Haji Hasan, Menteri Besar Negeri Sembilan.
  The National Level of HASN 2017 Was Officiated by YAB Dato' Seri Utama Haji Mohamad Bin Haji Hassan, The Chief Minister of Negeri Sembilan

- Pemenang Pertandingan Rekacipta dan Penerima Anugerah Sekolah Lestari Anugerah Alam Sekitar (SLAAS) Peringkat Kebangsaan 2017/2018 sempena HASN 2017
  The Winner of Design Competition And National SLAAS Award 2017/2018 In Conjuction With HASN 2017

Jadual 5.2 JAS : Pemenang Anugerah Khas Hari Alam Sekitar Negara 2017 (Bandar Lestari)
Table 5.2 DOE : The winners of the National Environment Day (HASN) Special Award 2017 (Sustainable City)

Anugerah Award	Bandar City	Pihak Berkuasa Tempatan Local Authorities
Anugerah Khas Hari Alam Sekitar Negara 2017 – Eco City	Putrajaya	Perbadanan Putrajaya
Anugerah Khas Hari Alam Sekitar Negara 2017 – Eco Historical City	Melaka Bandaraya Bersejarah	Majlis Bandaraya Melaka Bersejarah
Anugerah Khas Hari Alam Sekitar Negara 2017 – Clean Land City	Ampang Jaya	Majlis Perbandaran Ampang Jaya
Anugerah Khas Hari Alam Sekitar Negara 2017 – Clean Air City	Bandar Tangkak	Majlis Daerah Tangkak
Anugerah Khas Hari Alam Sekitar Negara 2017 – Eco Park City	Bandar Sri Sendayan	Majlis Perbandaran Nilai/ Majlis Perbandaran Seremban

Program Pengumpulan Buangan Elektrik dan Elektronik Isi Rumah (Household E-Waste) Bersempena Dengan Hari Bumi

Sambutan Hari Bumi yang diadakan pada 22 April setiap tahun adalah hari di mana masyarakat di seluruh dunia bergabung tenaga untuk menyemai rasa tanggungjawab serta meningkatkan kesedaran di kalangan masyarakat untuk melindungi bumi dan alam sekitar melalui pelbagai program kesedaran dan aktiviti alam sekitar. Sambutan secara global ini menjadi inisiatif yang penting dalam menerapkan dan meningkatkan lagi kecintaan masyarakat terhadap alam sekitar.

Tema Hari Bumi pada tahun 2017 adalah “Environmental and Climate Literacy” atau “Kecelikan Alam Sekitar dan Iklim”. Tema ini diambil bertujuan untuk memastikan masyarakat terutamanya golongan muda yang bakal menjadi pemimpin Negara pada masa depan, celik dan prihatin terhadap isu-isu alam sekitar dan perubahan iklim serta mampu membuat keputusan dengan mengambil kira faktor-faktor alam sekitar. Dengan kecelikan isu-isu alam sekitar dan perubahan iklim di kalangan masyarakat kita, wawasan masa depan Negara kita akan lebih jelas, bagi memastikan rakyat Malaysia dapat menikmati persekitaran yang kondusif, bersih dan selesa, selari dengan pembangunan Negara.

Di Malaysia, pelbagai aktiviti berkaitan alam sekitar daripada pelbagai pihak telah dijalankan bersempena dengan Hari Bumi 2017. Kementerian Sumber Asli dan Alam Sekitar melalui Jabatan Alam Sekitar telah menganjurkan Program Pengumpulan Buangan Elektrik Dan Elektronik Isi Rumah (*Household E-Waste*) di

Household Electrical and Electronic Waste Collection Program In Conjuction With Earth Day 2017

The Earth Day which is celebrated on April 22 every year is a day where the communities all around the world unite and join the force to inculcate their sense of responsibility and raise awareness among the public to protect the earth and the environment by organizing various environmental awareness programs and activities. This global response is an important initiative in applying and enhancing the love for the environment among the community.

The theme of Earth Day 2017 is “Environmental and Climate Literacy”. This theme is aimed at ensuring the society, especially the young generation who will be the leaders of the nation in the future, to be literate and attentive to environmental issues and climate change, and able to make decisions with regard to environmental factors. With the inclusion of environmental issues and climate change among our societies, the future vision of our country will be clearer, in order to ensure the citizen can enjoy a conducive, clean and comfortable environment, in line with the nation’s development.

In Malaysia, various environmental related activities from various parties were being conducted in conjunction with Earth Day 2017. The Ministry of Natural Resources and Environment through the Department of Environment organized a Household Electrical and Electronic Waste Collection Program at Tangkak, Johor on 22nd April 2017

Tangkak, Johor pada 22 April 2017 dan telah dirasmikan oleh YB Datuk Ir. Dr. Haji Hamim bin Samuri, Timbalan 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 (*small appliances*). Program yang telah dihadiri oleh lebih kurang 2000 pengunjung daripada pelbagai lapisan masyarakat ini telah mendapat pengiktirafan *Malaysia Book of Records* sebagai program pengumpulan *household e-waste* yang terbanyak dengan jumlah terkumpul 36,144 kg. Pelbagai aktiviti tambahan menarik seperti cabutan bertuah, pameran dan sebagainya juga diadakan pada hari tersebut bagi memeriahkan sambutan Hari Bumi 2017.

and it was officiated by YB Datuk Ir. Dr. Haji Hamim bin Samuri, Deputy 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, cell phone and other small appliances (small appliances). The program was attended by approximately 2000 visitors from various parties and has been recognized by the Malaysia Book of Records to be the largest household e-waste collection program with a total cumulative amount of 36,144 kg. Various activities such as lucky draws, exhibitions and so on were also held during the celebration of Earth Day 2017.

SEKOLAH LESTARI ANUGERAH ALAM SEKITAR (SLAAS) SESI 2017/2018

Pertandingan Sekolah Lestari- Anugerah Alam Sekitar (SLAAS) bagi sesi 2017/2018 telah menarik minat sebanyak tujuh puluh lapan (78) buah sekolah rendah dan enam puluh tiga (63) buah sekolah menengah dari seluruh Malaysia. Daripada jumlah tersebut sebanyak sepuluh (10) buah sekolah untuk kategori sekolah rendah dan sepuluh (10) buah sekolah untuk kategori sekolah menengah telah terpilih ke peringkat kebangsaan. Senarai sekolah- sekolah tersebut adalah seperti di **Jadual 5.3 dan Jadual 5.4.**

SEKOLAH LESTARI ANUGERAH ALAM SEKITAR (SLAAS) 2017/2018 SESSION

SLAAS Award for 2017/2018 session had inspired seventy eight (78) primary schools and sixty three (63) secondary schools throughout the Malaysia to take part in the competition. Out of 133 participated school only ten (10) were chosen from each category for the finale. Eligible schools as in the **Table 5.3 and Table 5.4.**

Jadual 5.3 JAS : Senarai Sekolah Rendah Yang Terpilih Untuk Peringkat Kebangsaan

Table 5.3 DOE : List Of Primary Schools That Qualified To Final Round

Bil No	Nama sekolah School Name	Negeri State
1	SK Putra	Perlis
2	SK Kota Lama Kanan	Perak
3	SJKC Tsun Jin	W.P Kuala Lumpur
4	SK Bukit Damansara	W.P Kuala Lumpur
5	SK Seri Lalang	Johor
6	SJKC Kuala Kemaman	Terengganu
7	SJK (C) Tung Hua	Sarawak
8	SK Babagan Toki Inanam	Sabah
9	SK Lambidan, Kuala Penyu	Sabah
10	SJKC Cheng Ming, Keningau	Sabah

Jadual 5.4 JAS : Senarai Sekolah Menengah Yang Terpilih Untuk Peringkat Kebangsaan

Table 5.4 DOE : List Of Secondary Schools That Qualified To Final Round

Bil No	Nama sekolah School Name	Negeri State
1	SMJK Sin Min	Kedah
2	SMK Gemilang	Pulau Pinang
3	SMKA Tun Raha	Selangor
4	SMK Taman Dato' Harun	Selangor
5	SMK Seri Aman	Johor
6	SMK Padang Midin	Terengganu
7	SM Sains Tengku Muhammad Faris Petra	Kelantan
8	SMK Tan Sri Mohamed Yaacob	Kelantan
9.	SM St Micheal, Penampang	Sabah
10	SMK Tawau, Tawau	Sabah

Penganugerahan ini telah disempurnakan semasa sambutan Hari Alam Sekitar Negara (HASN) pada 21 Oktober 2017 bertempat di D'Tempat Sendayan Negeri Sembilan. Anugerah ini telah disampaikan oleh YAB Menteri Besar Negeri Sembilan, Dato' Seri Utama Haji Mohamad Bin Haji Hasan dan disaksikan oleh YB Menteri Sumber Asli dan Alam Sekitar Datuk Seri Wan Junaidi Bin Tuanku Jaafar beserta pegawai-pegawai kanan jabatan dan agensi persekutuan serta negeri.

The SLAAS Award was presented during the National Environment Day Celebration (HASN) on 21st October, 2017 at D'Tempat, Sendayan, Negeri Sembilan. The awards were delivered by YAB Menteri Besar Negeri Sembilan, Dato' Seri Utama Haji Mohamad Bin Haji Hasan witnessing by YB Minister of Natural Resources and Environment (NRE), Datuk Seri Wan Junaidi Bin Tuanku Jaafar and other senior officers from various state and federal agencies.

Sekolah yang berjaya merangkul Anugerah SLAAS Sesi 2017/2018 dan membawa pulang wang tunai sebanyak RM 10,000.00 (Ringgit Malaysia Sepuluh Ribu) beserta piala, plak dan sijil adalah:

i. **Kategori Sekolah Rendah:**
SJK(C) Kuala Kemaman, Terengganu

ii. **Kategori Sekolah Menengah:**
SM St. Micheal, Penampang, Sabah

Manakala bagi kategori lain yang turut melibatkan pemberian hadiah wang tunai sebanyak RM 1,000.00, plak dan sijil adalah seperti di **Jadual 5.5 dan Jadual 5.6.**

The winners of SLAAS Award 2017/2018, received a cash money RM 10,000.00, a trophy, a plaque and certificate. The winner for SLAAS 2017/2018 session are:

i. **Primary School:**
SJK(C) Kuala Kemaman, Terengganu

ii. **Secondary School:**
SM St. Micheal, Penampang, Sabah.

Beside grand price, other awards were also given to the schools as a token for their outstanding efforts and performances in certain criteria with a cash money RM 1,000.00, plaque and certificate. List of winner as in the

Jadual 5.5 JAS : Senarai Pemenang Anugerah Khas (Sekolah Rendah)
Table 5.5 DOE : Winner for Special Award (Primary School)

Bil.	Anugerah Khas Special Award	Pemenang Winner
1	Pengurusan Management	SJK (C) Tung Hua, Sibu, Sarawak
2	Penghijauan Greening Activities	SJK (C) Cheng Ming, Keningau, Sabah
3	Kokurikulum Co-curiculum	SK Babagon Toki, Inanam, Sabah
4	Kepimpinan Budaya Lestari Sustainability Cultural Leadership	SK Kota Lama Kanan, Kuala Kangsar Perak
5	Perkongsian Kelestarian Sustainability Alliance	SK Lambidan, Kuala Penyu, Sabah
6	Inovasi Produk Mesra Alam Environmental Friendly Product Innovation	SK Putra, Kangar, Perlis

Jadual 5.6 JAS : Senarai Pemenang Anugerah Khas (Sekolah Menengah)
Table 5.4 DOE : Winner for Special Award (Secondary School)

Bil.	Anugerah Khas Special Award	Pemenang Winner
1	Pengurusan Management	SMK Sri Aman, Kota Tinggi, Johor
2	Penghijauan Greening Activities	SMKA Tun Rahah, Sg Besar, Selangor
3	Kokurikulum Co-curiculum	SMK Tawau, Tawau, Sabah
4	Kurikulum Curiculum	SMK Tan Sri Mohamed Yaacob, Tanah Merah, Kelantan
5	Keusahawanan Entrepreneurship	SMK Padang Midin
6	Kepimpinan - Individu Leadership – Individual	Pengetua SMK Padang Midin

Kejayaan Jabatan dalam menjayakan program ini adalah dengan kerjasama yang erat di antara Jabatan Alam Sekitar dengan Rakan Strategik iaitu Exxon Mobile Exploration and Production Malaysia Incorporation. Tahniah diucapkan kepada sekolah–sekolah yang berjaya dan ribuan terima kasih kepada Kerajaan Negeri Sembilan selaku tuan rumah yang sudi menganjurkan HASN 2017.

Table 5.5 and Table 5.6.

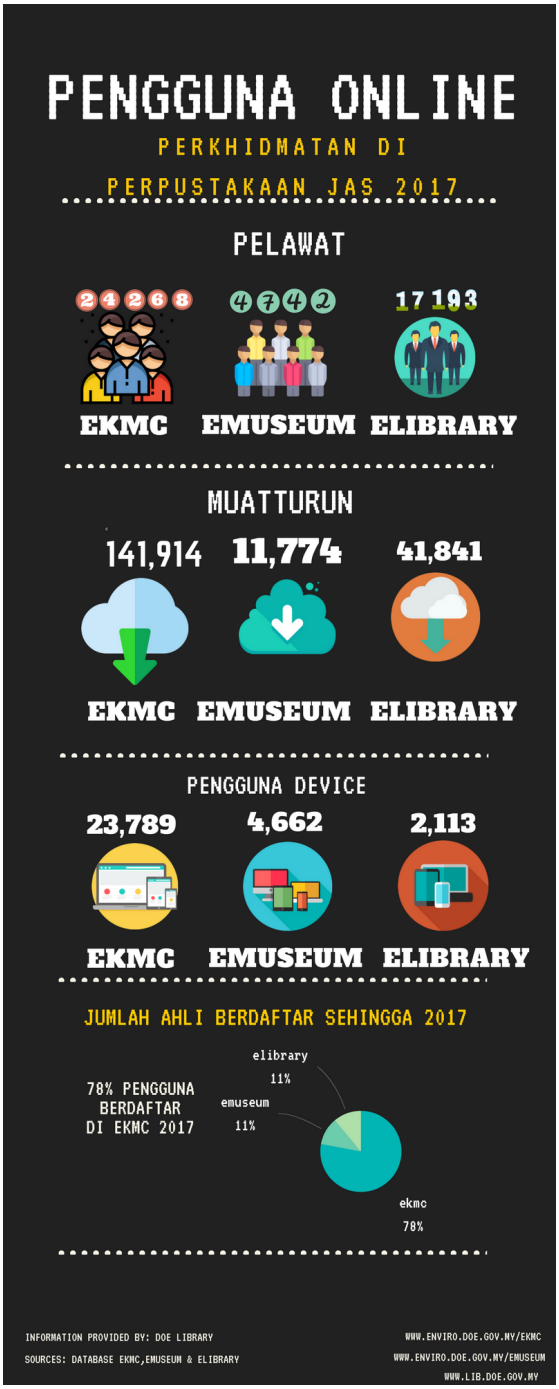
The achievement of the department in making the programmed succeed is a warm/great collaboration between Jabatan Alam Sekitar and Rakan Strategik which is EXXON Mobile Exploration and Production Malaysia Incorporation. Congratulations to the winners and thank you to the host Negeri Sembilan State Government for willing advocated HASN 2017.

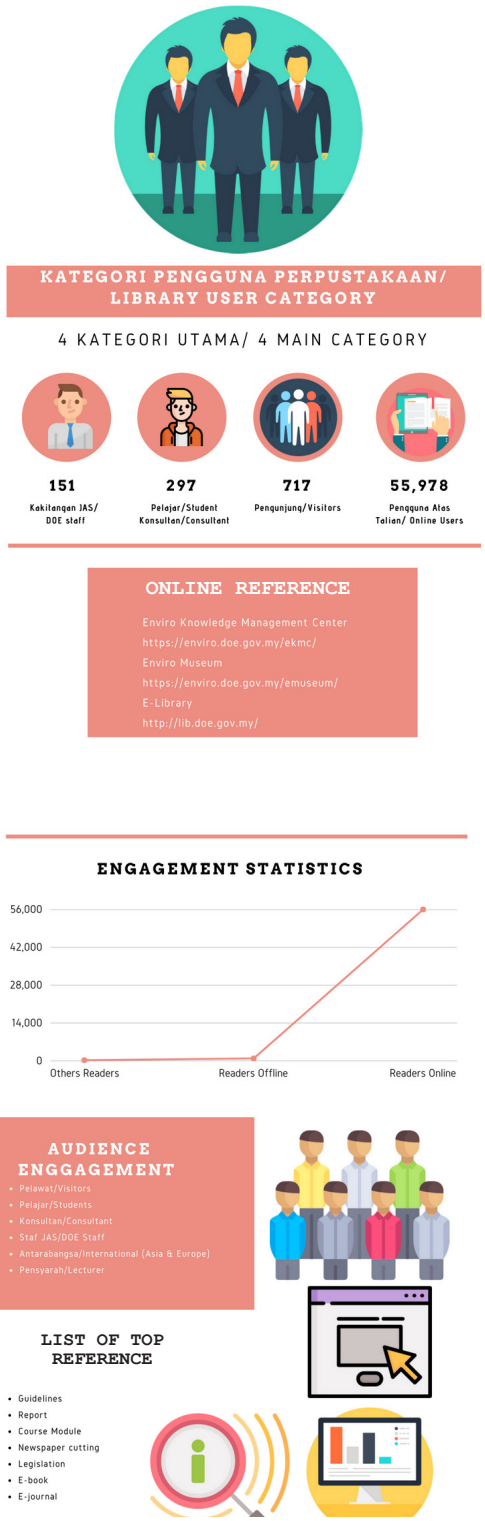
PERKHIDMATAN PERPUSTAKAAN-ENVIRO

Perpustakaan-Enviro yang terletak di Ibu Pejabat Jabatan Alam Sekitar berfungsi sebagai pusat rujukan kepada kakitangan JAS dan orang awam yang berdaftar. Sehingga 31 Disember 2017, koleksi bahan rujukan adalah sebanyak 22,774 buah. Pada tahun 2017, bilangan pengguna di perpustakaan adalah seramai 448 orang dan penggunaan sistem *online* iaitu EKMC,EMUSEUM serta Elibrary adalah seramai 55,798.

ENVIRO-LIBRARY SERVICE

Enviro-Library located at the Headquarters of the Department of Environment serves as a reference center for DOE staff and civilians who are registered. Up to 31st December, 2017, a collection of reference materials was 22,774. In 2017, the number of users in the library was 448 people and the use of online systems i.e. EKMC, EMUSEUM and E-Library was 55,798.





Aktiviti Perpustakaan

Persidangan ICT dan Geospatial, Jabatan Alam Sekitar

Pada 3 April hingga 7 April 2017, unit perpustakaan telah dijemput untuk membentangkan *success story* berkaitan dengan perkhidmatan *online* iaitu EKMC atau lebih dikenali sebagai *Enviro Knowledge Management Center.* Program ini bertujuan untuk berkongsi kejayaan dan ilmu berkaitan dalam pengurusan maklumat di Perpustakaan secara *online*.

Library Activities

ICT and Geospatial Conference, Department of Environment

On 3rd April to 7th April, 2017, the library unit has been invited to present a success story related to online services ie EKMC or better known as the Enviro Knowledge Management Center. The programme aims to share the success and knowledge related to information management in the online library.

▶ Persidangan ICT dan Geospatial, Jabatan Alam Sekitar
ICT and Geospatial Conference, Department of Environment

Program Membaca 10 Minit

Pada 24 April 2017, Unit Perpustakaan telah mengadakan program membaca 10 minit di setiap bahagian, negeri dan cawangan Jabatan Alam Sekitar sebagai tanda sokongan kepada kempen membaca. Ia bertujuan untuk memupuk semangat cintakan ilmu dan suka membaca dikalangan warga JAS.

Reading Program for 10 Minutes

On 24th April, 2017, the Library Unit held a 10-minute reading programme at each department, state and branch of the Department of Environment as a sign of support for the reading campaign. It aims to foster a sense of love and knowledge in reading among JAS.

Program Membaca 10 Minit
10 Minutes Reading Programme

Penganugerahan Penyelaras Enviro Knowledge Management Center (EKMC) dan Enviro Museum (EMUSEUM)

Unit Perpustakaan telah mengadakan penganugerahan EKMC dan EMUSEUM kepada penyelaras yang paling aktif. Penganugerahan ini diadakan sebagai menghargai sumbangan yang diberikan oleh penyelaras dalam memuatnaik maklumat dan bahan rujukan di EKMC dan EMUSEUM. Penganugerahan ini telah diadakan bersempena dengan Perhimpunan Bulanan Jabatan Alam Sekitar di Dewan Baiduri, Kementerian Sumber Asli dan Alam Sekitar.

Enviro Knowledge Management Center (EKMC) and Enviro Museum (EMUSEUM) Coordinator Award

The Library Unit held the EKMC and EMUSEUM award to the most active coordinators. The award was held in recognition of the contribution made by the coordinator in uploading information and reference materials at EKMC and EMUSEUM. The award was held in conjunction with the DOE Monthly Assembly at Baiduri Hall, Ministry of Natural Resources and Environment

Penganugerahan Penyelaras *Enviro Knowledge Management Center (EKMC) dan Enviro Museum (EMUSEUM)*
Enviro Knowledge Management Center (EKMC) and Enviro Museum (EMUSEUM) Coordinator Award

Mesyuarat dan Bengkel Penyelaras EKMC dan EMUSEUM Bilangan 1/2017

Mesyuarat dan bengkel ini telah diadakan di Dewan Baiduri, Kementerian Sumber Asli dan Alam Sekitar dan telah dipengerusikan oleh YBhg. Dato Dr. Ahmad Kamarulnajuib bin Che Ibrahim, Ketua Pengarah Alam Sekitar. Mesyuarat ini banyak membincangkan kemajuan sistem *online* EKMC dan EMUSEUM bagi memastikan keperluan rujukan maklumat mencapai tahap yang terbaik kepada pengguna dalam dan luar negara.

EKMC dan EMUSEUM Coordinator Meeting and Workshop Volume 1/2017

The meeting and workshop was held at Baiduri Hall, Ministry of Natural Resources and Environment and was chaired by YBhg. Dato Dr. Ahmad Kamarulnajuib bin Che Ibrahim, Director General of Department of Environment. The meeting discussed the progress of the EKMC and EMUSEUM online systems and ensure that the information reference requirements reach the best possible level for domestic and foreign users.

Mesyuarat dan Bengkel Penyelaras EKMC dan EMUSEUM Bilangan 1/2017
EKMC dan EMUSEUM Coordinator Meeting and Workshop Volume 1/2017

Mesyuarat dan Bengkel Penyelaras EKMC dan EMUSEUM Bilangan 2/2017

Mesyuarat dan bengkel ini telah diadakan di Hotel Dorset Putrajaya pada 18 September hingga 20 September 2017 dan telah dipengerusikan oleh Tuan Haji Ismail bin Ithnin, Timbalan Ketua Pengarah (Pembangunan) Jabatan Alam Sekitar. Mesyuarat kali ini banyak membincangkan penambahbaikan sistem *online* EKMC dan EMUSEUM serta mengutamakan sebaran maklumat yang lebih berkesan kepada pengguna. Peserta terdiri daripada penyelaras dari Ibu Pejabat Jabatan Alam Sekitar sahaja.

EKMC and EMUSEUM Coordinator Meeting dan Workshop Volume 2/2017

The meeting and workshop was held at Hotel Dorset Putrajaya from 18th September to 20th September, 2017 and was chaired by Tuan Haji Ismail bin Ithnin, Deputy Director General (Development), Department of Environment. This meeting discussed on upgrading the EKMC and EMUSEUM online system and effective dissemination to clients. Participants consists of coordinators from the Department of Environment Headquarters.

Mesyuarat dan Bengkel Penyelaras EKMC dan EMUSEUM Bilangan 2/2017
EKMC and EMUSEUM Coordinator Meeting dan Workshop Volume 2/2017

Kuiz Alam Sekitar Secara Online

Unit Perpustakaan telah mengadakan Kuiz Alam Sekitar Sempena Hari Alam Sekitar Negara secara *Online*. Program ini diadakan pada 21 Oktober hingga 23 Oktober 2017. Ia bertujuan untuk memberi peluang kepada peserta yang berada jauh dari lokasi program iaitu di D'Tempat Sendayan, Negeri Sembilan untuk menyertai kuiz ini. Peserta boleh menjawab soalan secara *online* tentang alam sekitar dan menerima sijil penyertaan sebagai tanda sokongan kepada program ini.

Online Environmental Quiz

The Library Unit held the Online Environmental Quiz in conjunction with the National Environment Day. The program is held from 21st October to 23rd October, 2017. This programme gives the opportunities to participant who is located away from D'Tempat, Sendayan, Negeri Sembilan to participate in this quiz. Participants will answer online questions related to the environment and will receive a certificate of participation as a sign of support for the program.

HARI ALAM SEKITAR NEGARA
"Alam Sekitar Tanggungjawab Bersama"

Kuiz Alam Sekitar Sempena
Hari Alam Sekitar Negara 2017
(Sekolah Rendah & Menengah)

Scan Disini

Setiap Penyertaan Akan
Menerima Cenderahati Dari

Rakan Alam Sekitar

Layari http://bit.ly/KuizAlamSekitar2017

Lawatan Kerja ke Kumpulan Media Karangkraf, Shah Alam

Lawatan ini diadakan untuk memberi pendedahan kepada pegawai JAS tentang bidang penerbitan serta proses penyuntingan dan penerbitan yang sebenar dalam menghasilkan majalah.

Visit to Karangkraf Media Group, Shah Alam

This visit aims to provide exposure to DOE officers in the field of publishing as well as the actual editing and publishing process involve in producing magazines.

▶ **Lawatan Kerja Ke Kumpulan Media Karangkraf, Shah Alam**
Visit to Karangkraf Media Group, Shah Alam

BAB 6
CHAPTER 6

HAL EHWAL ALAM SEKITAR ANTARABANGSA - KERJASAMA DUA HALA
INTERNATIONAL ENVIRONMENTAL AFFAIRS - BILATERAL COOPERATION

Mesyuarat Kelima Belas Kumpulan Kerja Jawatankuasa Bersama Malaysia - Singapura mengenai Alam Sekitar (MSJCE WG)

Mesyuarat Kelima belas Kumpulan Kerja Jawatankuasa Bersama Malaysia - Singapura mengenai Alam Sekitar (WG of MSJCE) telah diadakan pada 23 Mei hingga 24 Mei 2017 di Singapura. Encik Ronnie Tay, Ketua Pegawai Eksekutif, National Environment Agency, Singapura dan Y.Bhg. Dato' Ahmad Kamarulnajuib bin Che Ibrahim, Ketua Pengarah Alam Sekitar, Malaysia telah mempengerusikan mesyuarat berkenaan.

Seramai tiga belas (13) orang delegasi dari pelbagai agensi Malaysia seperti Kementerian Luar Negeri, Jabatan Peguam Negara, Jabatan Pengaliran dan Saliran, Unit Perancang Ekonomi (Johor, Johor Port Authority dan wakil dari Kementerian Sumber Asli dan Alam Sekitar telah menghadiri Mesyuarat ini. Sementara itu, 41 orang delegasi dari pelbagai agensi diantaranya Lembaga Pembekalan Awam, Kementerian Pembangunan Negara, Kementerian Hal Ehwal Luar Negeri, Lembaga Perumahan dan Pembangunan, Maritime and Port Authority, Kementerian Alam Sekitar dan Sumber Air membentuk perwakilan Singapura.

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

The 15th Malaysia - Singapore Joint Committee on the Environment Working Group Meeting (MSJCE WG)

The 15th Malaysia - Singapore Joint Committee on the Environment (MSJCE) Working Group Meeting (WG of MSJCE) was held in Kuala Lumpur on 23rd May to 24th May, 2017. Mr. Ronnie Tay, Chief Executive Officer, National Environment Agency, Singapore and Dato' Ahmad Kamarulnajuib bin Che Ibrahim, Director-General of Environment, Malaysia co-chaired the Meeting.

A total of by thirteen (13) 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 41 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 marked an important role for both countries to exchange information and experiences in tackling environmental issues of mutual interest.

Mesyuarat Kelima belas Kumpulan Kerja Jawatankuasa Bersama Malaysia - Singapura mengenai Alam Sekitar (MSJCE WG) pada 23 Mei - 24 Mei 2017 di Singapura
The 15th Malaysia - Singapore Joint Committee on the Environment Working Group Meeting (MSJCE WG) on 23th May- 24th May 2017 in Singapore

Malaysia – *People's Republic of China*

Jabatan Alam Sekitar melalui Kementerian Sumber Asli dan Alam Sekitar (NRE) telah menerima jemputan untuk menghadiri *China-ASEAN Workshop on Environmentally Sound Technology* pada 17 April hingga 21 April 2017 di Wuzhou, Wilayah Guangxi, China.

Program tersebut dianjurkan oleh *China-ASEAN Environmental Cooperation Center (CAEC)* dan *Guangdong-Guangxi Interprovincial Pilot Cooperation Special Zone (GGCZ)*. Program ini merupakan salah satu aktiviti pembangunan modal insan dan pertukaran teknologi di bawah CAEC untuk meningkatkan kesedaran alam sekitar dan pengurusan bagi menyokong pembangunan ekonomi hijau di bawah *The Plan of Green Silk Road Envoys*.

Program ini telah dihadiri oleh enam belas (16) orang pegawai NRE dan JAS Malaysia dan tiga belas (13) orang pegawai daripada agensi kerajaan negara China.

Skop program meliputi sesi pembentangan berkaitan dasar alam sekitar negara, pelan pembangunan, aktiviti-aktiviti yang menggalakkan pengunaan teknologi hijau dan jaringan kerjasama industri.

Malaysia – People's Republic of China

The Department of Environment Malaysia through the Ministry of Natural Resources and the Environment (NRE) was invited to attend the China-ASEAN Workshop on Environmentally Sound Technology,17th April to 21th April, 2017 in Wuzhou, Guangxi Province, China.

The programme was organised by China-ASEAN Environmental Cooperation Center (CAEC) and Guangdong-Guangxi Interprovincial Pilot Cooperation Special Zone (GGCZ). This programme was one of the human resources development and exchange of technology activities by CAEC to enhance the environmental awareness and management to support the green economic growth under The Plan of Green Silk Road Envoys.

The programme was attended by sixteen (16) officers from NRE and DOE Malaysia and thirteen (13) officers from the PRC's government agencies.

The scope of the programme covered presentations on environmental policy, development plan, activities to promote green technology application and industrial cooperation networking.

Malaysia – Oman

Seramai dua belas (12) orang dari bahagian pengurusan alam sekitar, Oman telah mengadakan lawatan sambil belajar ke Jabatan Alam Sekitar pada 18 Jun 2017. Tujuan lawatan tersebut adalah untuk mempelajari dan berkongsi pengalaman mengenai pengurusan krisis alam sekitar di Malaysia.

Malaysia – Omani

A total of twelve (12) people from environment management section has been conducting a study tour to the DOE on 18th June, 2017. The purpose of this visit was to learn and share experience on environmental crisis management in Malaysia.

Lawatan Delegasi dari Oman ke JAS pada 18 Jun 2017
Visit by Omani delegation to DOE on 18th June 2017

Lawatan pegawai NRE dan JAS ke China pada 17 April hingga 24 April 2017
Visit of NRE and DOE Officer to China from 17th April to 24th April, 2017

HAL EHWAL ALAM SEKITAR ANTARABANGSA - KERJASAMA SERANTAU
INTERNATIONAL ENVIRONMENTAL AFFAIRS - REGIONAL COOPERATION

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.

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

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

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.

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.

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.

Pada tahun 2017, Malaysia telah menghadiri Mesyuarat ke-23 *Intergovernmental Meeting (IGM)* COBSEA pada 27 Februari hingga 28 Februari 2017 di Bangkok, Thailand yang dihadiri oleh wakil daripada Bahagian Pengurusan Alam Sekitar dan Perubahan Iklim (BPASPI), Kementerian Sumber Asli dan Alam Sekitar (NRE) dan wakil daripada Bahagian Air dan Marin (BAM), Jabatan Alam Sekitar (JAS). Selain itu, Malaysia turut menghantar peserta-peserta yang terdiri daripada wakil BPASPI, NRE dan BAM, JAS ke Bengkel *Draf Strategic Direction COBSEA* 2017-2021 yang telah diadakan pada 9 September 2017 di Bangkok, Thailand.

In 2017, Malaysia had attended the 23rd Intergovernmental Meeting of COBSEA on 27th February to 28th February, 2017 in Bangkok, Thailand. Representatives from Environmental Management and Climate Change Division (BPASPI), Ministry of Natural Resources and Environment (NRE) and from Water and Marine Division (BAM), Department of Environment (DOE) had attended and participated in this meeting. Malaysia also participated in the COBSEA Strategic Direction (2017 - 2021) Drafting Committee which was held on 9th September, 2017 in Bangkok, Thailand.

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, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand dan Viet Nam.

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.

Mesyuarat tahunan AWGCME merupakan platform bagi meningkatkan usaha sama di kalangan negara-negara ASEAN untuk menggalakkan aktiviti dan pembentukan dasar berkaitan dengan pencegahan dan kawalan pencemaran marin di rantau ini.

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.

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).*

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).

Mesyuarat AWGCME kali ke-18 telah diadakan pada 11 Mei hingga 12 Mei 2017 di Manila Filipina. Selain itu, Malaysia juga terlibat dengan Projek Kerjasama ASEAN mengenai *Climate Change and ASEAN Coastal Areas: Vulnerability, Impacts and Adaptation* yang turut melibatkan penyertaan pakar-pakar daripada Jabatan Pengairan dan Saliran (JPS) dan Institut Penyelidikan Hidraulik Malaysia (NAHRIM). Projek Fasa 1 ini melibatkan penyertaan Malaysia dalam Bengkel Inception di Hanoi, Vietnam 19 September hingga 20 September 2017 dan Bengkel Regional di Da Nang, Vietnam pada 13 November hingga 14 November 2017.

The 18th AWGCME Meeting was held on 11th May to 12th May, 2017 in Malaysia. In addition, Malaysia has also involved with the ASEAN Cooperation Project on Climate Change and ASEAN Coastal Areas: Vulnerability, Impacts and Adaptation which also involves the participation of experts from the Department of Irrigation and Drainage (DID) and the Malaysian Hydraulic Research Institute (NAHRIM). This Phase 1 project involves Malaysia's participation in the Inception Workshop in Hanoi, Vietnam from 19th September to 20th September, 2017 and Regional Workshop in Da Nang, Vietnam on 13th November to 14th November, 2017.

Malaysia turut dijemput untuk menghadiri ASEAN *Conference on Reducing Marine Debris in ASEAN Region* di Phuket, Thailand pada 22 November hingga 23 November 2017 bertujuan meningkatkan kesedaran bagi mencegah dan mengurangkan sisa plastik.

Malaysia is also participated in ASEAN Conference on Reducing Marine Debris in ASEAN Region in Phuket, Thailand on 22nd November to 23rd November, 2017 which aimed at enhancing awareness to prevent and to reduce marine debris.

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 and Thailand. Projek ini dibentuk bertujuan menambahbaik kehidupan penduduk pantai menerusi kerjasama pengurusan perikanan dan alam sekitar di peringkat serantau.

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.

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 Projek *Steering Committee (Fisheries)* untuk Malaysia di bawah projek ini.

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.

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.

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.

▶ Mesyuarat *COBSEA 23rd Intergoverment Meeting (IGM)*
Bangkok, Thailand 27 Februari hingga 28 Februari 2017
COBSEA 23rd Inter Government Meeting (IGM), Bangkok, Thailand on 27th February to 28th February, 2017

Sebahagian daripada delegasi-delegasi negara-negara peserta di Mesyuarat *COBSEA 23rd Intergoverment Meeting (IGM)* Bangkok, Thailand 27 Februari hingga 28 Februari 2017
Participants of the participating countries at the COBSEA 23rd Inter Government Meeting (IGM), Bangkok, Thailand on 27th February to 28th February, 2017

Delegasi-delegasi Malaysia di Bengkel Regional Projek Kerjasama *ASEAN -Climate Change and ASEAN Coastal Areas: Vulnerability, Impacts and Adaptation* Da Nang, Vietnam 13 November hingga 14 November 2017
Malaysian Delegation at ASEAN-Climate Change and ASEAN Coastal Areas Regional Project Workshop: Vulnerability, Impacts and Adaptation, Da-Nang, Vietnam from 13th November to 14th November, 2017

Perjanjian ASEAN Mengenai Pencemaran Jerebu Merentas Sempadan

Perjanjian ASEAN Mengenai Pencemaran Jerebu Merentas Sempadan merupakan perjanjian yang telah ditanda tangani oleh sepuluh (10) negara ASEAN pada 10 Jun 2002 di Kuala Lumpur dan ia merupakan perjanjian serantau pertama di dunia yang mengikat daripada segi undang-undang sekumpulan negara-negara bersempadan menangani masalah jerebu merentas sempadan akibat kebakaran hutan dan tanah gambut. Malaysia merupakan negara yang pertama yang telah meratifikasi Perjanjian ini pada 3 Disember 2002. Indonesia telah meratifikasi Perjanjian dengan mendepositkan dokumen ratifikasi kepada Setiausaha Agung ASEAN pada 20 Januari 2015.

Perjanjian ini antara lain menetapkan obligasi negara anggota ASEAN untuk mengambil langkah daripada aspek undang-undang dan pentadbiran serta tindakan untuk memenuhi tanggung jawab setiap negara anggota seperti yang termaktub dalam Perjanjian tersebut. Antara tanggung jawab yang penting adalah seperti berikut:-

i. Bekerjasama dalam membangunkan dan melaksanakan langkah-langkah pemantauan (monitoring) awal jerebu ;
ii. Mencegah (prevention) kebakaran tanah dan hutan serta jerebu;
iii. Melaksanakan prosedur tindakbalas kecemasan bersama (joint emergency response);
iv. Bekerjasama menubuhkan dana jerebu ASEAN; dan
v. Melaksanakan kerjasama teknikal serta penyelidikan saintifik terhadap masalah jerebu merentasi sempadan.

ASEAN Agreement On Transboundary Haze Pollution (AATHP)

ASEAN Agreement on Transboundary Haze Pollution (AATHP) is an agreement that has been signed by ten (10) countries of ASEAN on 10th June 2002 in Kuala Lumpur and it is the first regional treaty in the world to bind legally of border states to handle the transboundary haze problem due to forest fires and peatlands.. Malaysia is the first country to ratify this Agreement on 3rd December, 2002. Indonesia had ratified the Agreement by depositing ratification documents to ASEAN Secretary-General on 20th January, 2015.

This agreement stipulates the obligations of member countries to take measures of the legal aspects and administrative and other measures to fulfill the responsibility of each member state, as stipulated in the Agreement. Among the key responsibilities are as follows: -

i. Cooperate in developing and implementing initial hazard monitoring measures;
ii. Prevent land and forest fires and haze;
iii. Implement joint emergency response procedures;
iv. Work together to establish ASEAN haze fun; and
v. Carry out technical cooperation as well as scientific research on cross border haze problems.

Di peringkat ASEAN, Malaysia merupakan negara anggota yang berperanan aktif dalam menerajui isu-isu pencegahan jerebu merentas sempadan melalui mesyuarat-mesyuarat *Conference of the Parties (COP) to the ASEAN Agreement on Transboundary Haze Pollution* dan *Subregional Ministerial Steering Committee (MSC) on Transboundary Haze Pollution* yang diadakan secara berkala. Mesyuarat MSC dilaksanakan semenjak tahun 2006 bagi membincangkan masalah jerebu merentas sempadan.

Terdapat 2 subregional MSC iaitu:

i. *Subregional Northen ASEAN Countries* atau *Mekong MSC*'yang dianggotai oleh negara Thailand, Cambodia, Myanmar, Laou dan Vietnam; dan

ii. *Subregional Southern ASEAN Countries* yang dianggotai oleh negara Brunei Darussalam, Indonesia, Malaysia, Singapura dan Thailand. Mesyuarat diurusetiakan oleh Sekretariat ASEAN.

Mesyuarat Subregional MSC kali ke-17 di Jakarta, Indonesia pada 28 Julai 2015, para Menteri MSC turut mengalu-alukan penyertaan Indonesia sebagai negara Parti Ke-10 kepada Perjanjian ASEAN Mengenai Pencemaran Jerebu Merentas Sempadan apabila Kerajaan Indonesia mendepositkan instrumen ratifikasinya kepada Setiausaha Agung ASEAN pada 20 Januari 2015. Melalui ratifikasi sepenuhnya ini, negara-negara ASEAN dapat meningkatkan kerjasama bagi menangani masalah pencemaran jerebu merentas sempadan dengan lebih berkesan di bawah kerangka Perjanjian berkenaan.

Yang terkini, menerusi Mesyuarat ke-19 the *Sub-Regional Ministerial Steering Committee on Transboundary Haze Pollution (19th MSC)* dan *Meeting of the Technical Working Group on Transboundary Haze Pollution (19th TWG)* yang telah diadakan pada 17 Mei hingga 18 Mei 2017 di Kuala Lumpur, Malaysia beserta negara-negara sub-serantau lain iaitu Brunei, Indonesia, Singapura dan Thailand mengulangi komitmen untuk terus mempertingkatkan kerjasama serantau bagi mencegah jerebu merentas sempadan. Antara komitmen negara-negara terlibat adalah untuk melaksanakan seperti berikut:

At the ASEAN level, Malaysia plays an active role in leading transboundary haze prevention issues through meetings of the "Conference of the Parties (COP) to the ASEAN Agreement on Transboundary Haze Pollution" and "Subregional Ministerial Steering Committee (MSC) on Transboundary Haze Pollution "which is held regularly. The Subregional MSC meeting had started since 2006 to discuss transbondary haze problems.

There are 2 subregional MSC which is:

i. The Subregional Northern ASEAN 'Mekong MSC' comprises Thailand, Cambodia, Laos, Myanmar and Vietnam; and

ii. The Subregional Southern ASEAN comprises Brunei Darussalam, Indonesia, Malaysia, Singapore and Thailand. The meetings are coordinated by the ASEAN Secretariat.

In the 17th MSC Meeting in Jakarta, Indonesia on 28th July, 2015, MSC Ministers also welcomed Indonesia's participation as the 10th Party country to the ASEAN Agreement on Transboundary Haze Pollution when the Government of the Republic of Indonesia deposited its instrument of ratification to the ASEAN Secretary-General on 20th January, 2015. Through this full ratification, ASEAN countries can enhance cooperation to address the problem of transboundary haze pollution more effectively under the framework of the Agreement.

The latest, through the 19th Meeting of the Sub-Regional Ministerial Steering Committee on Transboundary Haze Pollution (19th MSC) and the Meeting of the Technical Working Group on Transboundary Haze Pollution (19th TWG) held on 17th May to 18th May, 2017 in Kuala Lumpur Malaysia and other sub-regional countries Brunei, Indonesia, Singapore and Thailand reiterated their commitment to further enhanced regional cooperation to prevent transboundary haze. Among the commitments involved have to implement the followings:

i. Melaksanakan *Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation* bagi memastikan supaya visi ASEAN Bebas Jerebu pada tahun 2020 dapat dicapai;

ii. Memuktamadkan perjanjian penubuhan *ASEAN Coordinating Centre (ACC) on Transboundary Haze Pollution* yang berpangkalan di Jakarta di mana ACC bertindak sebagai penyelaras bagi menangani isu jerebu di rantau ini; dan

iii. Memuktamadkan *Study on the Economic, Health and Social Impact of Haze in 2015 on the ASEAN Region*.

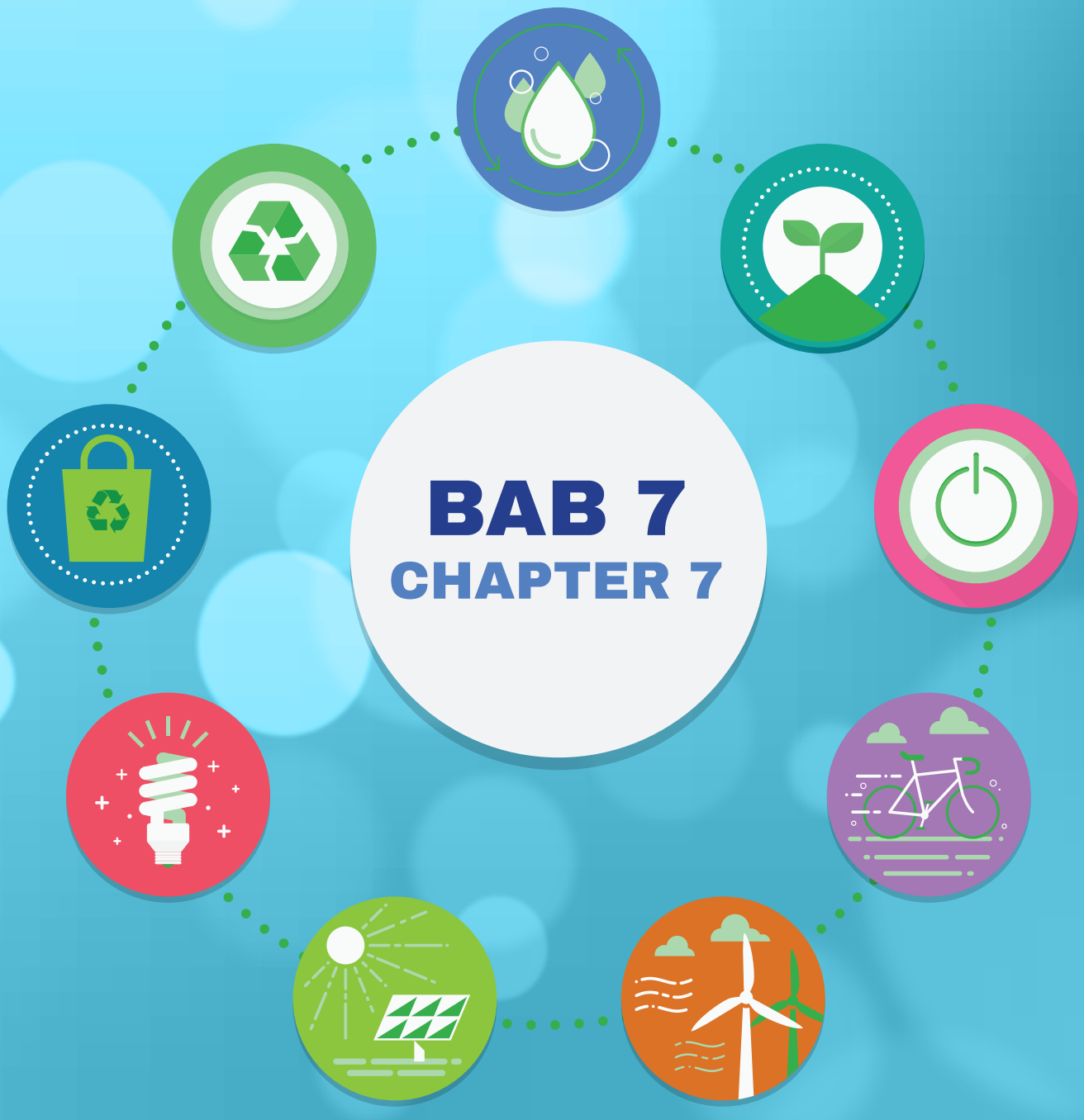
Malaysia juga telah menghadiri Mesyuarat Ke-13 *Conference of the Parties (COP-13) to the ASEAN Agreement on Transboundary Haze Pollution (AATHP)* di Brunei Darussalam pada 12 September hingga 13 September 2017. Di dalam mesyuarat tersebut, negara anggota ASEAN mengulangi komitmen untuk bersama-sama memastikan inisiatif-inisiatif yang ditetapkan di dalam *Roadmap on ASEAN Cooperation Towards Transboundary Haze Pollution Control with Means of Implementation* ini dilaksanakan dengan sempurna bagi mencapai matlamat ASEAN Bebas Jerebu menjelang 2020. Mesyuarat juga bersetuju agar satu kajian dilaksanakan bagi melihat sejauh mana pencapaian inisiatif dan program yang ditetapkan di bawah pelan tindakan ini yang mana kajian ini akan bermula pada tahun 2018.

i. Implement Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation to ensure that the ASEAN Haze Free Vision in 2020 is achievable;

ii. Finalise the agreement on the establishment of ASEAN Coordinating Centre (ACC) on Transboundary Haze Pollution that based in Jakarta where ACC acts as coordinator to address haze issues in the region;

iii. Finalise The Study on the Economic, Health and Social Impact of Haze in 2015 on the ASEAN Region.

Malaysia's delegation had also participated in the 13th Meeting of the Parties (COP-13) to the ASEAN Agreement on Transboundary Haze Pollution (AATHP) at Brunei Darussalam on 12th September to 13th September, 2017. In the meeting, ASEAN member states reiterated their commitment to ensure that the initiatives set out in the Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation to be implemented in order to achieve ASEAN Haze-Free goals by 2020. The meeting had also agreed that a study need to be conducted to oversee the achievement of the initiatives and programmes set under this action plan and the study will commence in 2018.



BAB 7
CHAPTER 7

PENGURUSAN TEKNOLOGI MAKLUMAT
INFORMATION TECHNOLOGIES (IT) MANAGEMENT

PUSAT DATA ALAM SEKITAR (EDC)
ENVIRONMENTAL DATA CENTRE (EDC)

Pusat Data Alam Sekitar adalah pusat pengumpulan data Kualiti Alam Sekitar Negara berperanan sebagai pusat penerimaan dan pengurusan data, pemantauan dan analisa data, penyampaian dan visualisasi data, sumber sokongan terhadap keputusan dan aktiviti-aktiviti lain yang berkaitan bagi memaksimumkan penggunaan data yang dicerap, termasuk aktiviti pemodelan, ramalan, dan juga penjanaan serta sebaran maklumat kualiti alam sekitar

Core centre for national environmental quality data, for the purpose of air, river and marine data retrieval and management, data analysis, monitoring and analysis, presentation and visualisation, decision support, and other activities to maximise the use of collected environmental data which include modeling, forecasting and information generation/dissemination.

EDC terdiri daripada tiga (3) komponen utama:
EDC three (3) main components:

Kompleks Server atau ***Server Farm*** yang menempatkan semua perkakasan server, pangkalan data dan sistem aplikasi
SERVER FARM which hosts servers, security devices, networking hardware, databases and applications

Pusat Kawalan atau ***Command Centre*** yang berperanan sebagai pusat pemantauan sistem, data dan informasi kualiti alam sekitar
EDC COMMAND CENTRE which primary function is to monitor Environmental Quality Monitoring System data and information;

Pusat **Pemulihan Bencana atau *Disaster Recovery Centre*** *(DRC)* yang menempatkan perkakasan dan salinan pangkalan data serta aplikasi bagi tujuan sokongan (*backup*) operasi.
DISASTER RECOVERY CENTRE which hosts backup servers, backup databases and mirror applications – server as a backup operation center.

7/24 **365** **Operation days**

Beroperasi secara berterusan, 24/7/365
Continuous operation 24/7/365

Berperanan sebagai pusat kawalan ketika berlaku insiden alam sekitar
Memastikan program pemantauan kualiti alam sekitar beroperasi secara bersepadu dan lancar
EDC as Centralised Command Centre during Environmental Incidences

EDC sebagai Pusat Setempat (*One Stop Centre*) bagi Pemantauan Kualiti Alam Sekitar Negara
Centralised EDC as One Stop Centre for National Environmental Quality Monitoring

EDC sebagai pusat sokongan utama Jabatan Alam Sekitar untuk mendapatkan pandangan pakar alam sekitar dan untuk tujuan penyelidikan
EDC as the core DOE support Centre for Professional Expert Advice and Research

PUSAT KAWALAN ALAM SEKITAR KEBANGSAAN
NATIONAL ENVIRONMENT CONTROL CENTRE (NECC)

Definisi Definition

National Environment Control Centre (NECC)
http://necc.doe.gov.my

Integrasi aplikasi sistem pemantauan, pengawasan,dan pelaporan sedi ada bagi pengesanan pencemaran yang cekap serta penyaluran maklumat yang tepat untuk tindakan susulan penguatkuasaan mahupun membuat keputusan.
Integration of an existing monitoring, surveillance and reporting application for higher accuracy detection of pollution event and also to provide a precise information for both enforcement action and decision making.

Senarai Modul List Module

National Environment Control Centre (NECC)
http://necc.doe.gov.my

Modul yang terlibat adalah :-
List of Module :-

- eKAS
- OER
- eSWIS
- Oil spill Trajectory
- EQMP
- iRemote
- GIS

Pengguna User

National Environment Control Centre (NECC)
http://necc.doe.gov.my

Pengguna sistem adalah :-
- Petugas bilik NECC
- Bahagian Pengkuatkuasa
- Pemilik setiap sistem yang diintegrasikan

User of the system includes:-
- NECC officer
- Enforcement Division
- Owner of each integrated system involved

SISTEM KELULUSAN JENIS KENDERAAN
VEHICLE TYPE APPROVAL ONLINE SYSTEM (VTA)

Vehicle Type Approval Online System (VTA)
https://vta.doe.gov.my

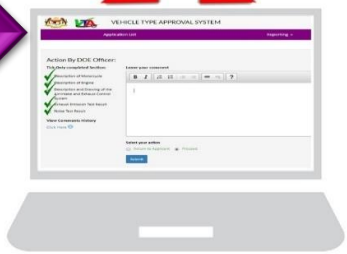
MOTORSIKAL
MOTORCYCLE

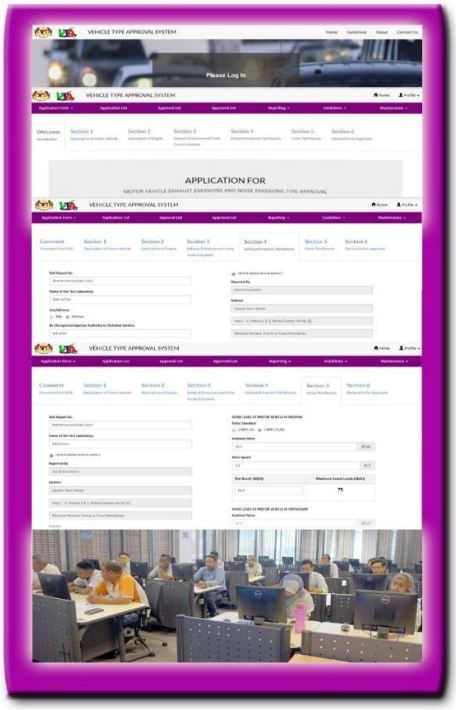
KENDERAAN BERMOTOR
MOTOR VEHICLE

MODUL SEDIA ADA
EXISTING MODULE

MODUL BARU
NEW MODULE

PROSES PERMOHONAN VTA OLEH PEGAWAI JAS SECARA ATAS TALIAN
ONLINE PROCESS APPLICATION BY DOE OFFICER





SIJIL KELULUSAN DIKELUARKAN SECARA ATAS TALIAN
ONLINE APPROVAL AND CERTIFICATION

Permohonan VTA melibatkan semua pengilang / pemasang / pengimport kenderaan bermotor atau motorsikal model baru atau sedia ada yang pertama kali akan didaftarkan di Malaysia
VTA Online application is applied to the motor vehicles or motorcycles manufacturer / assemble / imported for the existing or new model for the first time registration in Malaysia

JAWATANKUASA PEMANDU ICT (JPICT)
ICT STEERING COMMITTEE (JPICT)

Jawatankuasa yang bertanggungjawab untuk menyelaras dan memantau permohonan perolehan, pembangunan dan pelaksanaan projek ICT bagi Jabatan Alam Sekitar.
A committee that responsible to coordinate and monitor procurement application, project development application and project execution process that related to ICT for Department of Environment.

Pengerusi :
Chairman :

Ketua Pengarah atau pegawai yang diturunkan kuasa **Ahli** :
General Director or authorized officer **Members :**

- Timbalan Ketua Pengarah (Pembangunan) - Merangkap Ketua Pegawai Maklumat JAS (*Chief Information Officer*,CIO)
- Deputy Director General (Development) – cum Chief Information Officer for DOE (CIO)
- Pengarah Bahagian Teknologi Maklumat - Merangkap Pengurus ICT JAS dan Pegawai Keselamatan ICT JAS (*ICT Security Officer*,ICTSO)
- Director of Information Technology Division – cum ICT Security Officer for DOE (ICTSO)
- Pengarah Bahagian Penguatkuasa
- Director of Enforcement Division
- Pengarah Bahagian Udara
- Director of Air Division
- Pengarah Bahagian Air & Marin
- Director of Water & Marine
- Pengarah Bahagian Bahan Berbahaya
- Director of Hazardous Substances Division
- Pengarah Bahagian Penilaian
- Director of Assessment Division
- Pengarah Bahagian Komunikasi Strategik
- Director of Strategic Communication Division
- Pengarah Institut Alam Sekitar (EiMAS)
- Director of Environment Institute of Malaysia
- Ketua Unit Industri Hijau
- Head of Green Industry Unit

Urus Setia :
Secretariat :
Bahagian Teknologi Maklumat
Information Technology Division

Pada tahun 2017, JPICT JAS telah bersidang sebanyak dua (2) kali. Sebanyak tiga belas (13) kertas permohonan dengan jumlah nilai sebanyak RM4,459,864.00 telah diluluskan oleh JPICT JAS.
In 2017, the committee has met twice and approved thirteen (13) applications with total amount RM4,459,864.00.

SENARAI PROJEK ICT DILULUSKAN OLEH JPICT JAS
LIST OF APPROVED APPLICATIONS BY JPICT IN YEAR 2017

Peralatan ICT bagi Bilik Operasi Jabatan Alam Sekitar **ICT Equipment fo DOE's Operation Room**
Membekal Peralatan Video Conference (VC) untuk Jabatan Alam Sekitar **To Supply Video Conference (VC) Equipment for DOE**
Perolehan Peralatan Tambahan ICT Untuk Jabatan Alam Sekitar **Procurement of Additional ICT Equipment for DOE**
Pembangunan Sistem Pelaporan KPI GSR Secara Atas Talian (Online) untuk Jabatan Alam Sekitar **Development of KPI GSR Online Reporting System for DOE**
Pembangunan Sistem Pangkalan Data Hydrocarbon Fingerprinting untuk Jabatan Alam Sekitar **Development of Hydrocarbon Fingerprinting Database System for DOE**
Pembangunan dan Penaiktarafan Sistem eKAS 3.0 **Development and Upgrade of eKAS 3.0 System**
Penaiktarafan Bilik Server JAS Sarawak **Room Server Upgrade for JAS Sarawak**
Perolehan Perkakasan Rangkaian JAS Kedah **Procurement of Network Equipment for JAS Kedah**
Penaiktaran Rangkaian JAS Cawangan Tawau **Network Upgrade for JAS Tawau**
Penaiktarafan Rangkaian JAS Perlis **Network Upgrade for JAS Perlis**
Menaiktaraf Rangkaian Setempat (LAN) di Jabatan Alam Sekitar Negeri Selangor **Local Area Network (LAN) Upgrade for JAS Selangor**
Perolehan Perkakasan Rangkaian di Jabatan Alam Sekitar Putrajaya **Procurement of Network Equipment for JAS Putrajaya**

PERSIDANGAN ICT & GEOSPATIAL JABATAN ALAM SEKITAR
ICT & GEOSPATIAL CONFERENCES DEPARTMENT OF ENVIRONMENT MALAYSIA

Mesyuarat & Bengkel ICT
ICT Meeting & Workshops

Sesi perkongsian hala tuju ICT jabatan dan pembentangan pelan tindakan.
Sharing and presentations session on Department's ICT action plan and way-forward.

Mesyuarat & Bengkel GIS
GIS Meeting & Workshop

Sesi perkongsian hala tuju GIS jabatan dan pembentangan pelan tindakan.
Sharing and presentations session on Department's Geospatial action plan and way-forward.

Sesi Pameran
Exhibitions

Pempamer terdiri daripada MaCGDI, TM, ESRI, Aldercy Creation Sdn Bhd dan DELL Malaysia
Exhibitors : MaCGDI, TM, ESRI, Aldercy Creation Sdn. Bhd. and DELL Malaysia.

3-7 April 2017

Hotel Bangi Putrajaya

150 Peserta
150 Participants
5 Pempamer
5 Exhibitors

Sesi Technology Update
Technology Update

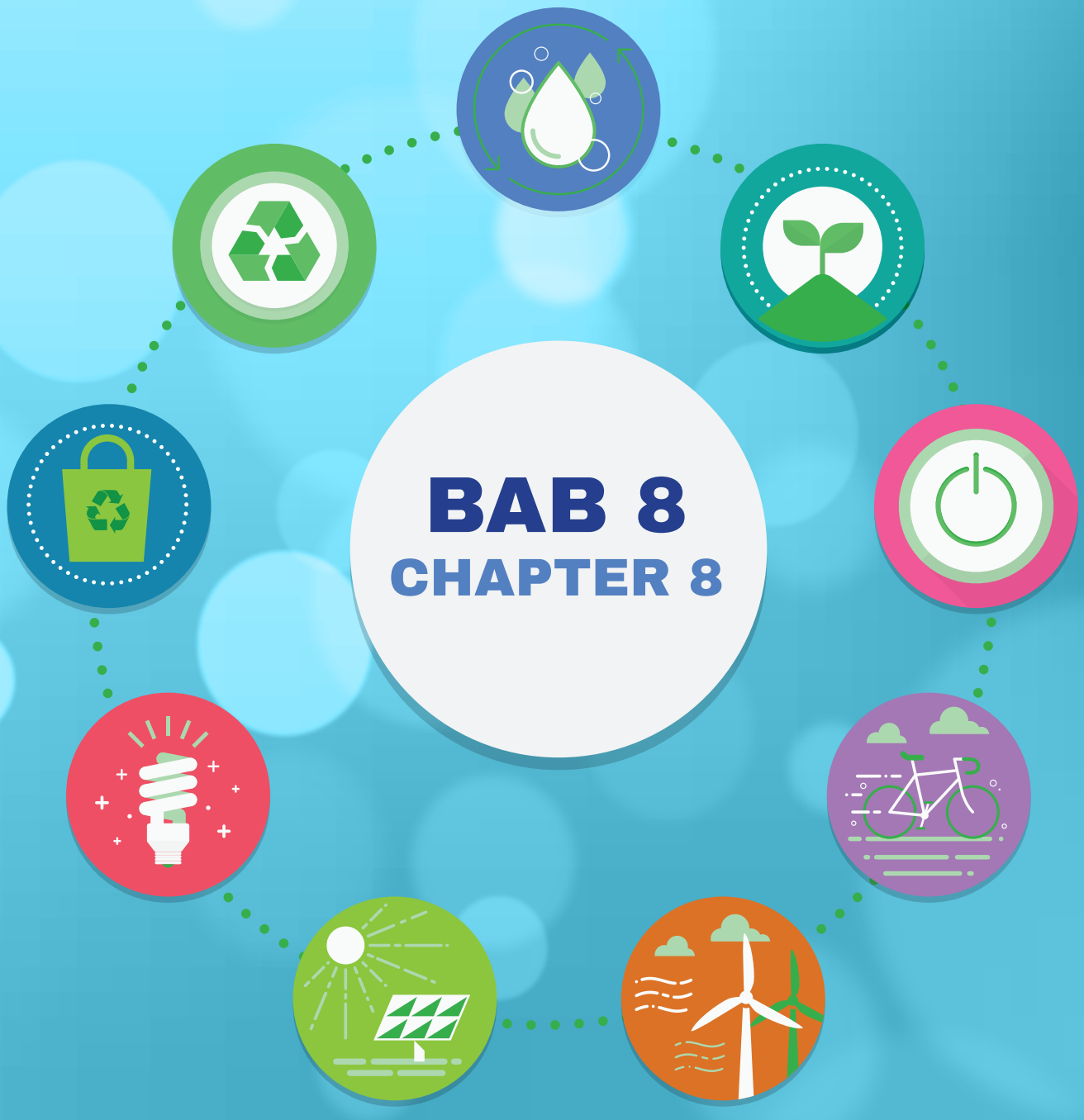
1.Insight for Arcgis (ESRI)
Insight for ArcGIS (ESRI)
2. Webinar melalui Google Hangout (BTM)
Webinar through Google Hangout (BTM)
3. Antivirus E-Scan oleh (Vinmaju Sdn Bhd)
Antivirus E-Scan (Vinmaju Sdn Bhd)

Pelan Strategik Teknologi Maklumat
IT Strategic Plan

Sesi Pelancaran & Pembentangan PSTM (ISP) 2016-2020
Information Technology Strategic Plan (ISP) 2016-2020 : Launching and Presentation Session

Sesi Pembentangan
Presentations

Success Story Geospatial I, II, III & ICT (ESWIS,EKMC,E-MUZIUM)



BAB 8
CHAPTER 8

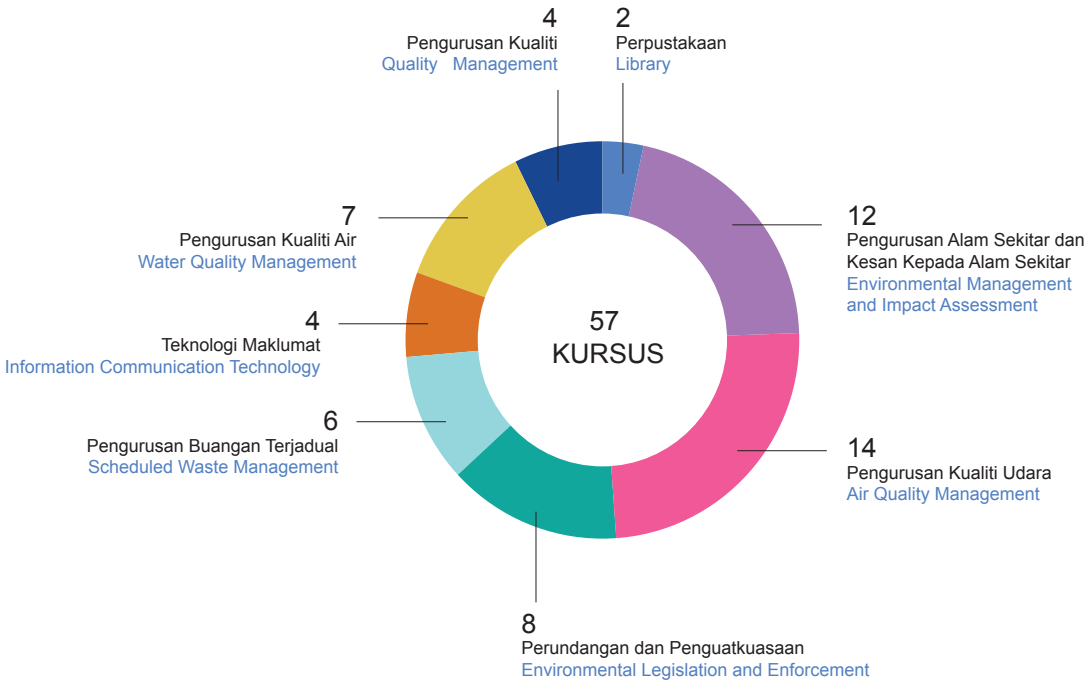
INSTITUT ALAM SEKITAR MALAYSIA (EiMAS)
ENVIRONMENT INSTITUTE OF MALAYSIA (EiMAS)

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.

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

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.

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.

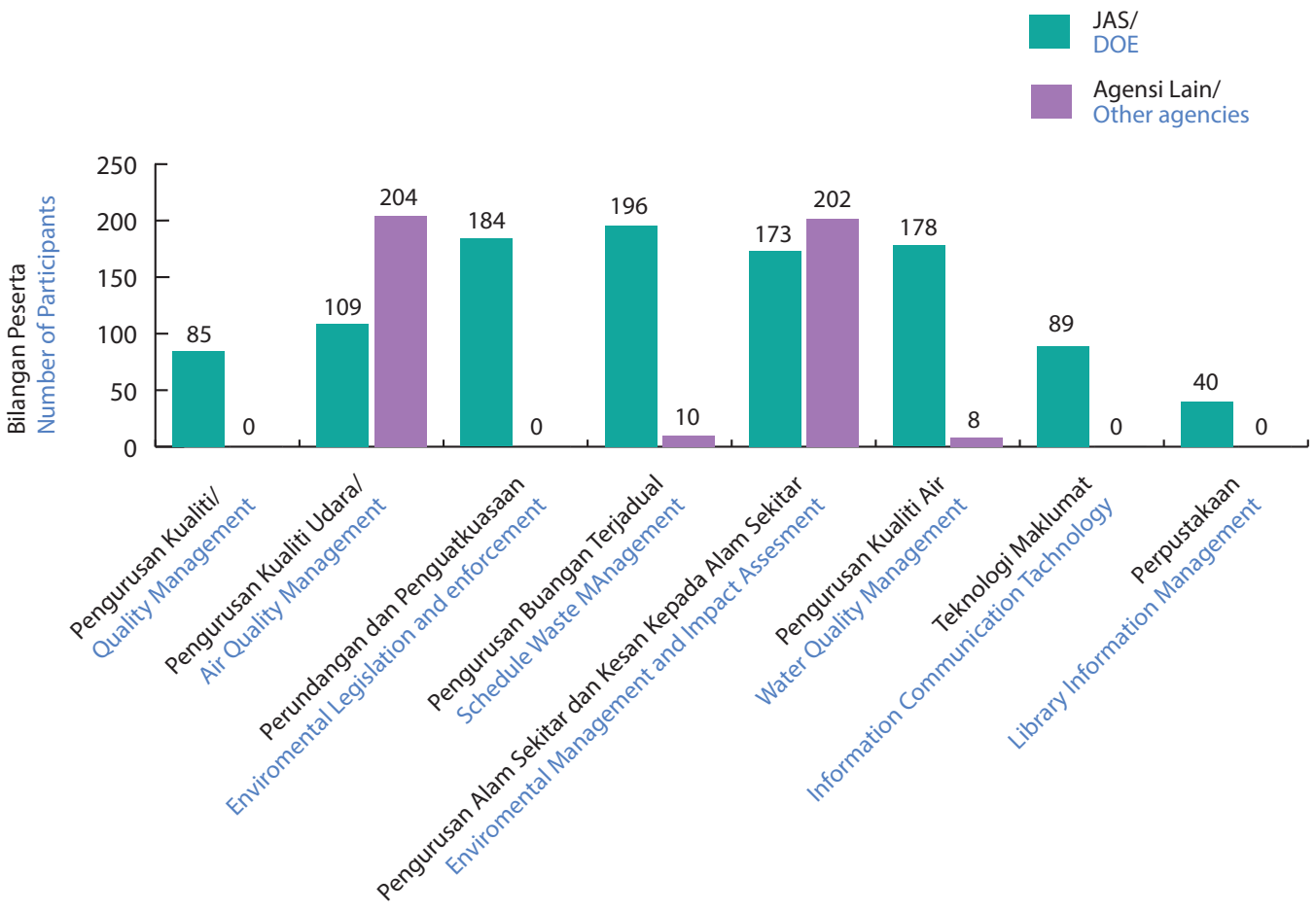


Rajah 8.1 JAS : Program Latihan EiMAS 2017

Figure 8.1 DOE : EiMAS Training Programmes 2017

Pada tahun 2017, EiMAS telah berjaya menyediakan latihan kepada sejumlah **1,478 peserta** melalui **57 kursus** yang telah dijalankan, seperti yang ditunjukkan dalam **Rajah 8.1. Jadual 8.1** menyenaraikan kursus-kursus yang telah dilaksanakan mengikut kategori.

In 2017, EiMAS has successfully conducted **57 training** courses for a total of **1478 participants**, as shown in **Figure 8.1**. **Table 8.1** lists the courses conducted by category.



Rajah 8.2 JAS : Bilangan peserta mengikut kategori kursus
Figure 8.2 DOE : Number of participants by course category.

Daripada 1,478 peserta yang menyertai program latihan yang dilaksanakan, 1,054 orang (71%) adalah kakitangan Jabatan Alam Sekitar (JAS), manakala selebihnya adalah peserta dari agensi-agensi lain yang berkaitan seperti **Rajah 8.2.**

Out of the 1,478 participants, 1,054 participants (71%) were from Department of Environment (DOE) while the rest were participants from other related agencies as shown in **Figure 8.2.**

Jadual 8.1 JAS : Senarai Program Latihan EiMAS, 2017

Table 8.1 DOE: EiMAS Training Programmes List, 2017

Tajuk Kursus Mengikut Kategori Course Title By Category
Pengurusan Kualiti Air / Water Quality Management
1. IETS Engineering Made Simple for DOE Officers – Applications in EIA and Enforcement 2. Certified Environmental Professional in Palm Oil Mill Effluent Treatment System Inspection (CePPOMETSI) 3. Certified IETS Notification Reviewer 4. Course On Practical Enforcement II – Methods Of Sampling And Preservation 5. Certified Environmental Professional In Leachate Treatment Plant Inspection (CePLTPI)
Pengurusan Kualiti Udara / Air Quality Management
1. Certified Environmental Professional In Scrubber Inspection (CePSICourse On Certified Environmental Professional In Bag Filter Inspection (CePBFI) 2. Competency Course On Control Of Air Pollution From The Emission Of Motor Vehicle Type 3. Course on Certified Environmental Professional on Air Pollution Control Engineering (Design Reviewer) 4. Attachment Programme on An Introduction To The Execution of CEMS In Industries
Perundangan dan Penguatkuasaan / Environmental Legislation and Enforcement
1. Course on DOE Uplifting Services Program: Record Keeping Application (Series I) 2. Bengkel Penambahbaikan Kaedah Pelaksanaan Program Kompetensi Audit Industri Hijau & Green Industry Auditor 3. Course on DOE Uplifting Services Program: Record Keeping Application (Series II) 4. Kursus Pemahaman dan Kemahiran Tangkapan Mengikut Undang-Undang Peringkat Lanjutan 5. Kursus Tatacara Memberi Keterangan di Mahkamah 6. Bengkel Pengukuhan GSR: Pelaksanaan Penguatkuasaan GSR, Pelaporan KPI Bulanan dan Sukutahun 7. Kursus Prosedur dan Tatacara Memohon Perintah Mahkamah (Pelucutan Hak Eksibit Yang Disita), Perundingan Sebelum Perbicaraan, Pengurusan Kes dan Tawaran Pengakuan 8. Bengkel Pelaksanaan Kursus Kompetensi Audit Industri Hijau Bagi Pegawai JAS dan Industri
Pengurusan Buangan Terjadual / Scheduled Waste Management
1. Protocol and Standard Practices on Sampling of Scheduled Wastes 2. Certified Environmental Professional in Scheduled Wastes Inspection (CePSWI)Siri 1 3. Certified Environmental Professional in Scheduled Wastes Inspection (CePSWI)Siri 2 4. Certified Environmental Professional in Scheduled Wastes Inspection (CePSWI)Siri 3 5. Introduction to Chemical Management; 6. Control of Import and Export of Scheduled Wastes

Tajuk Kursus Mengikut Kategori
Course Title By Category

Pengurusan Alam Sekitar Dan Kesan Kepada Alam Sekitar/ Environmental Management and Impact Assessment

1. Course On Air Quality Modelling For EIA Projects (Level 1)
2. Course On Water Quality Modelling For EIA Projects
3. Course On Hydraulic Modelling & Morphology For Coastal Development Projects (Level 1 & Level 2)
4. Course on Geospatial (Borneo Zone)
5. Induction Course for Environmental Auditors
6. Workshop on Competent Erosion and Sediment Control Inspector (CESCI) Module Improvement (Series 1 & 2)
7. Seminar on Erosion and Sediment Control BMPs (Series 1,2,3,4)

Pengurusan Kualiti/ Quality Management

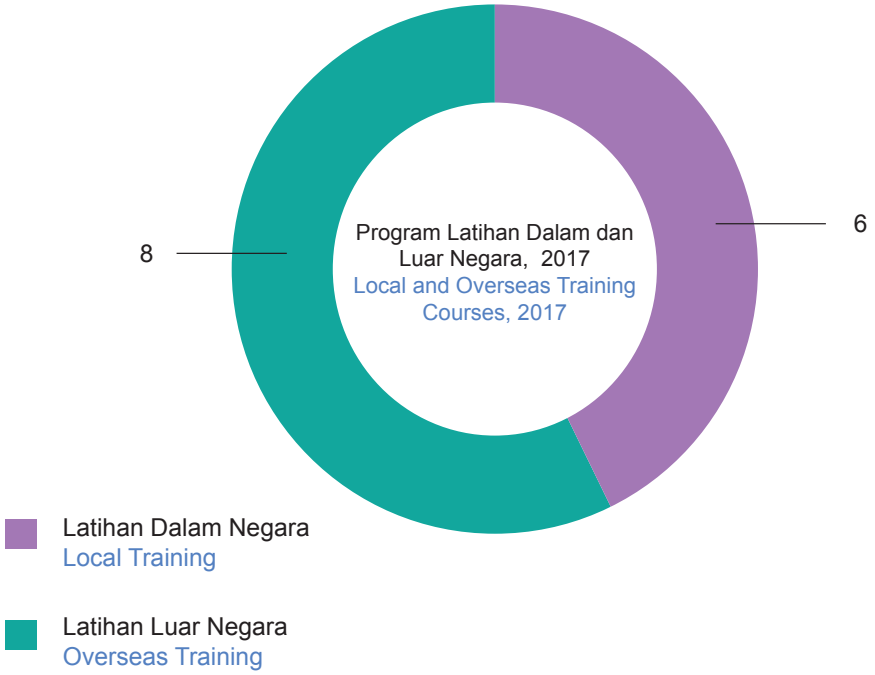
1. The Art of Negotiation Skills Course (Siri 1)
2. Diplomatic Communication Course
3. Train The Trainer Course
4. Evaluation on Effectiveness of Training Course

Teknologi Komunikasi Maklumat/ Information Communication Technology

1. Kursus Sistem National Registry Of Certified Environmental Professionals (NRCEP)
2. Kursus Electronic Scheduled Waste Information System (ESWIS)
3. Kursus Penyediaan Montaj
4. Kursus Sistem Penguatkuasaan Bergerak (MFORCE)

Pengurusan Maklumat Perpustakaan/ Library Information Management

1. Bengkel Enviro Knowledge management Centre (EKMC) dan E-Museum Siri 1
2. Bengkel Enviro Knowledge management Centre (EKMC) dan E-Museum Siri 2



Rajah 8.3 JAS: Program Latihan Dalam dan Luar Negara, 2017
Figure 8.3 DOE : Local and Overseas Training Courses, 2017

Program Latihan di Dalam dan Luar Negara

Selain daripada latihan dalaman, EiMAS turut menguruskan pencalonan pegawai-pegawai JAS untuk berkursus di dalam dan luar negara serta mengikuti program sangkutan/ latihan di beberapa industri dan agensi seperti yang disenaraikan.

Pada tahun 2017, seramai sembilan (9) orang pegawai JAS telah menghadiri sejumlah enam (6) kursus dalam negara dan lapan (8) kursus luar negara yang telah diuruskan oleh EiMAS, seperti yang ditunjukkan dalam **Rajah 8.3**.

Local and Overseas Training Programmes

Apart from internal training, EiMAS also sent DOE officers for training and attachment programs at selected industries and agencies, either locally or abroad, as listed.

A total of nine (9) DOE officers attended six (6) local courses and eight (8) overseas courses in 2017, as shown in Figures 8.3.

Jadual 8.2 JAS : Program Sangkutan dan Latihan Luar Negara, 2017

Table 8.2 DOE : Overseas Attachment Programs and Training Courses, 2017

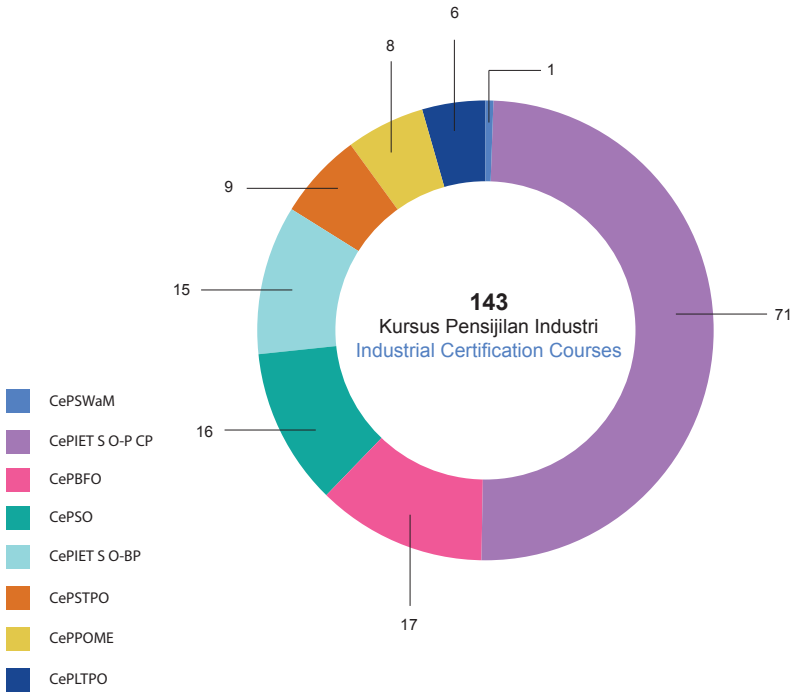
Bil. No.	Tajuk Title	Penganjur Organizer	Tempat Place	Tarikh Date
1.	Urban Solid Waste Management	Program Singapore Cooreration Promgramme Training Award/Small Island Developing States Technical Coorperation Programme (SCPTA/ SIDSTEC)	Singapore	13 – 17 Februari 2017
2.	Capacity Building Towards Air Quality Management	Japan International Coorperation Agency (JICA)	Japan	5 Julai – 11 Ogos 2017
3.	Program LEP.2.0 Management Training Program For Junior Officer 2017	Japan International Coorperation Agency (JICA)	Japan	17 Julai – 11 Ogos 2017
4.	Capacity Building for Ratification and Implementation of the Minamata Convention on Mercury	Japan International Cooperation Agency (JICA)	Japan	9 Oktober – 10 November 2017
5.	Best Available Technique (BAT) and Best Environmental Practice (BEP) under the context of United Nations Industrial Development Organizations (UNIDO)	Thailand International Coorperation Agency (TICA)	Thailand	2 – 20 Oktober 2017
6.	Urban Air and Water Quality Management	Program Singapore Cooreration Promgramme Training Award/Small Island Developing States Technical Coorperation Programme (SCPTA/ SIDSTEC)	Singapore	6 - 10 November 2017
7.	Program Kursus Bagi Subject Matter Experts Dalam Kawalan Pencemaran Marin (Tumpahan Minyak	Program Institut Latihan Awam, Jabtan Perkhidmatan Awam	Australia	22 – 26 Oktober 2017

Bil. No.	Tajuk Title	Penganjur Organizer	Tempat Place	Tarikh Date
8.	Climate Change Adaptation Strategies	Program Singapore Cooreration Promgramme Training Award/Small Island Developing States Technical Coorperation Programme (SCPTA/ SIDSTEC)	Singapore	11 -15 Disember 2017

Jadual 8.3 JAS : Latihan di Dalam Negara, 2017

Table 8.3 DOE : Local Training Courses, 2017

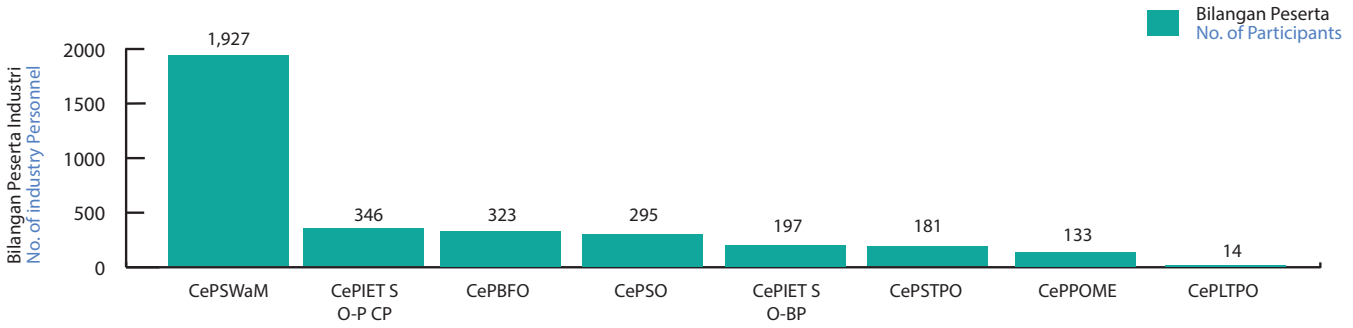
Bil No	Tajuk Title	Penganjur Organizer	Tempat Place	Tarikh Date	Bilangan Peserta No. of Participants
1.	2 Day Course On "Fundamental of Project Management For Chemical Engineers"	The Institution of Engineers Malaysia (IEM)	Hotel Hilton, Petaling Jaya	26 - 27 April 2017	1
2.	Kursus Perakaunan Forensik Sektor Awam Dan Swasta	UKM	UKM-MTDC Technology Centre, UKM	23 - 24 Mei 2017	2
3.	National Conference on Stormwater Management and Erosion & Sediment Control	Malaysian Stormwater Organisation (MSO)	TH Hotel & Convention Centre, Terengganu	18 - 20 Sept 2017	1
4.	Sabah World Rivers Day Conference and Exhibition	The Institution of Engineers Malaysia - IEM (Sabah Branch)	IEM Sabah	19 - 20 Sept 2017	2
5.	Bengkel Penggubalan Perundangan Pindaan	Jabatan Peguam Negara	Dewan Tan Sri Abdul Kadir Yusof, Jabatan Peguam Negara	2 - 5 Okt 2017	2
6.	Intan Public Policy Insights Series (IPPIS) 2/2017	INTAN Bukit Kiara	Dewan Seri Baiduri, INTAN Bukit Kiara	14-Nov-17	1



Rajah 8.4 JAS : Bilangan Kursus Pensijilan Industri Yang Dianjurkan, Tahun 2017
Figure 8.4 DOE : Number Of Industry Certification Courses Conducted, Year 2017

Sepanjang tahun 2017, sebanyak 8 jenis kursus pensijilan industri telah dilaksanakan dengan jumlah 143 siri kursus, seperti yang ditunjukkan dalam **Rajah 8.4**.

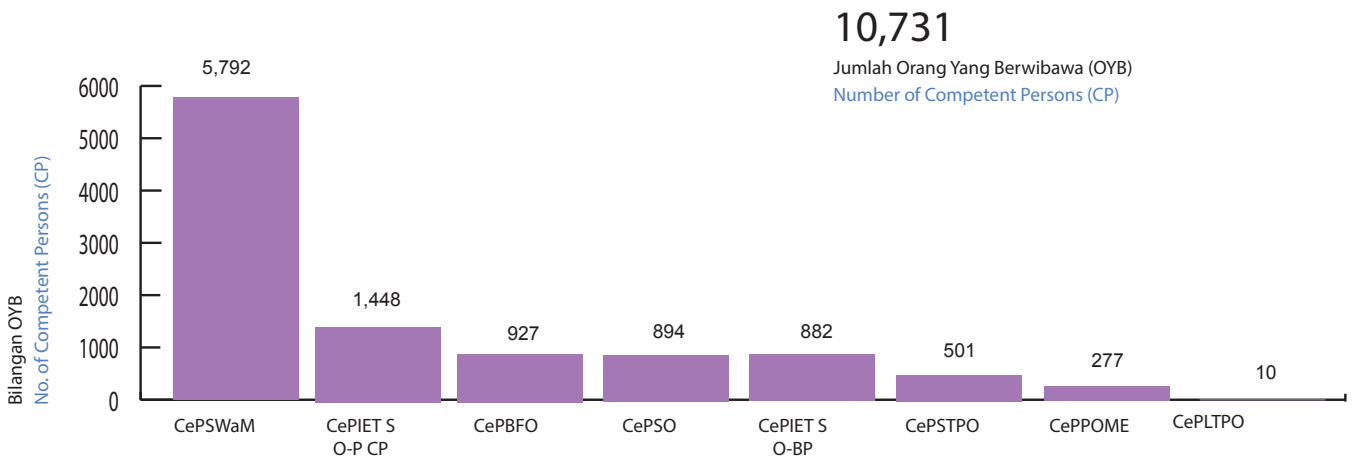
During 2016, a total of 8 types of industrial certification courses were conducted with a total of 143 series of courses, as shown in **Figure 8.4**.



Rajah 8.5 JAS: Statistik Bilangan Pegawai Industri Dilatih Mengikut Kursus, Tahun 2017
Figure 8.5 DOE: Number Of Industry Personnel Trained According To Course, Tahun 2017

Kursus *Certified Environmental Professional in Scheduled Waste Management* (CePSWAM) mencatat bilangan kehadiran pegawai industri yang tertinggi seperti yang ditunjukkan di dalam **Rajah 8.5.**

Course for Certified Environmental Proffesional in Scheduled Waste Management (CePSWAM) recorded the highest number of attendance from industrial personnel as shown in **Figure 8.5.**

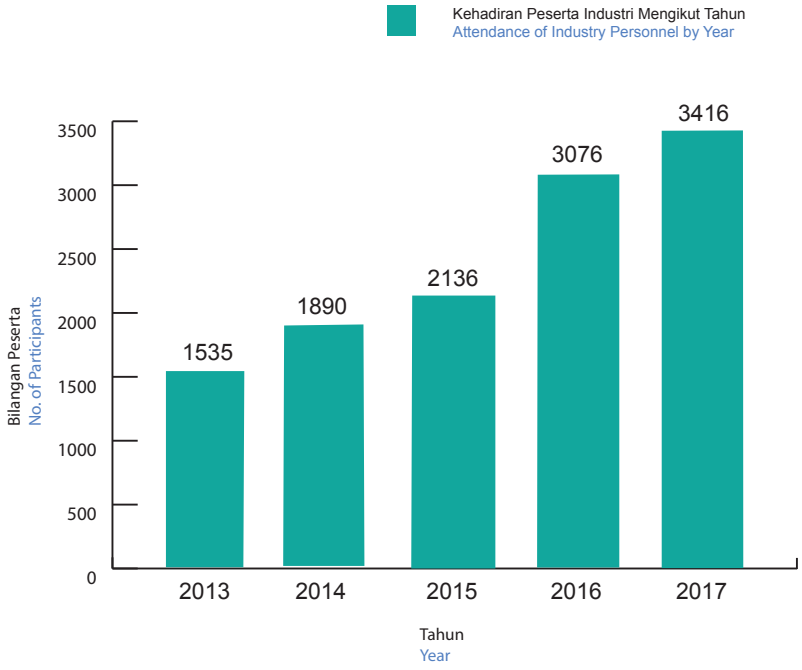


Rajah 8.6 JAS : Statistik Bilangan Orang Yang Berwibawa Mengikut Jenis Pensijilan Secara Keseluruhan Sehingga 31 Disember 2017

Figure 8.6 DOE : Statistics Of Competent Persons According To Type Of Certification Till 31St December 2017

Rajah 8.6 menunjukkan sehingga 31 Disember 2017, EiMAS telah berjaya mengiktiraf seramai 10,731 orang pegawai industri sebagai Orang Yang Berwibawa selaras dengan kehendak Seksyen 49A, Akta Kualiti Alam Sekeliling 1974.

Figure 8.6 shows that until 31st December 2017, EiMAS has successfully certified a total of 10,731 industry personnel as a Competent Person in accordance with the requirements of Section 49A of the Environmental Quality Act, 1974.



Rajah 8.7 JAS : Bilangan Kehadiran Pegawai Industri Bagi 5 Tahun Terkini (2013 – 2017)

Figure 8.7 DOE: Attendance Of Industry Personnel For The Last 5 Years (2013 – 2017)

Bilangan kehadiran pegawai industri bagi kursus pensijilan dari tahun 2013 hingga 2017 seperti yang ditunjukkan dalam **Rajah 8.7**.

The attendance of industry personnel for industry certification courses from 2013 to 2017 as shown in **Figure 8.7.**

Majlis Konvokesyen Orang Yang Berwibawa
Convocation Ceremony For Competent Persons

Majlis Penganugerahan Sijil Orang Yang Berwibawa kepada pegawai industri yang telah melengkapkan kesemua proses pensijilan telah diadakan pada 21 September 2017 bertempat di Hotel Bangi-Putrajaya. Sempena Majlis ini juga telah diadakan Seminar *Guided Self Regulation* (GSR) yang bertujuan untuk menyediakan satu landasan kepada Orang Yang Berwibawa (OYB) untuk menambah ilmu pengetahuan serta sentiasa peka dengan perkembangan terbaru dalam bidang pengurusan alam sekitar terutamanya inisiatif-inisiatif baharu yang diperkenalkan oleh Jabatan seperti *Guided Self Regulation* (GSR).

A Certificate Award Ceremony for industry personnel who have successfully completed the certification process and have been certified as a Competent Person was held on 21st September 2017 at Bangi-Putrajaya Hotel. In conjunction with this event, a Guided Self Regulation (GSR) Seminar was held to provide a platform to the Competent Person to enhance their knowledge and keep abreast with the latest developments in environmental management, especially new initiatives introduced by DOE such as Guided Self Regulation (GSR).

YBhg. Dato' Ketua Pengarah Alam Sekitar Bergambar Bersama Orang-Orang Yang Berwibawa
Photography Session Of YBhg. Dato' Director General Of Environment With The Competent Persons

YBhg. Dato' Ketua Pengarah Alam Sekitar Menyampaikan Sijil Orang Yang Berwibawa Kepada Pegawai Industri
YBhg. Dato' Director General Of Environment Presented The Competent Person Certificate To The Industry Personnel

Pegawai Industri Membaca Lafaz Ikrar Kod Etika Sebagai Orang Yang Berwibawa
Industry Personnel Reading The Pledge Of Competent Person's Code Of Ethics

Malaysian Technical Cooperation Programme (MTCP) Course On Environmental Management And Pollution Control

Program Kerjasama Teknikal Malaysia (MTCP), dengan Kementerian Luar Negeri sebagai *focal point*, telah dianjurkan pada 24 Julai hingga 4 Ogos 2017, 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, Oman, Timor Leste, Georgia, Azerbaijan, Lao PDR, Cambodia, Bahrain, Singapore, Namibia, Nepal, Bangladesh dan Morocco 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 manual (*Manual Monitoring*) dan sistem atas talian (*on-line system*);

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 24th July to 4th 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, Oman, Timor Leste, Georgia, Azerbaijan, Lao PDR, Cambodia, Bahrain, Singapore, Namibia, Nepal, Bangladesh and Morocco, 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 - Manual Monitoring and on-line system;

- Kawalan pencemaran air sisa/effluen dan pelepasan ke udara;
- Pendekatan perancangan bagi kawalan pencemaran dan impak, serta pencegahan;
- Isu-isu kawalan pencemaran spesifik bagi tumpahan minyak, pengurusan buangan terjadual, dan kawalan hakisan dan kelodakan; dan
- Keperluan kompetensi dalam pengendalian alat kawalan pencemaran air dan udara serta pengurusan buangan terjadual.

- Contamination of wastewater/ effluent and emissions into the air;
- Planning approach for pollution control and impact, and prevention;
- Control issues specific to oil spill pollution, 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.

Kursus Induksi Juruaudit Alam Sekitar
Induction Course for Environmental Auditors

Kursus Induksi Juruaudit Alam Sekitar

Pada tahun 2017, bagi memenuhi keperluan Skim Pendaftaran Jururaudit Alam Sekitar, EiMAS telah menjalankan Kursus Induksi Juruaudit Alam Sekitar kepada lima puluh (50) orang peserta pada 7 Mac hingga 10 Mac 2018.

Penganugerahan Sijil Penghargaan Kepada Tenaga Pengajar EiMAS

Sepanjang tahun 2017, EiMAS telah melaksanakan lima puluh tujuh (57) kursus dalaman untuk pegawai dan kakitangan JAS seluruh Malaysia. Kebanyakan tenaga pengajar kursus-kursus di EiMAS adalah terdiri daripada pegawai-pegawai JAS yang pakar dalam bidang masing-masing.

Induction Course for Environmental Auditors

In 2017, to meet the requirements under the Environmental Auditors Registration Scheme, EiMAS conducted Induction Course for Environmental Auditors to fifty (50) participants on 7th March to 10th March, 2018.

Certificates Of Appreciation To EiMAS Trainers

Throughout 2017, EiMAS has conducted fifty seven (57) internal courses for officers and staff of the DOE in Malaysia. Most of the trainers for EiMAS courses were DOE officers who are experts in their respective fields.

Sebagai menghargai jasa dan sumbangan semua pegawai JAS yang telah terlibat sebagai tenaga pengajar bagi kursus, latihan *hands-on* serta program kompetensi yang dianjurkan, EiMAS telah menganugerahkan penghargaan kepada seramai empat puluh satu (41) orang tenaga pengajar.

In recognition of the contributions by these officers to courses, hands-on and competency programs, EiMAS has awarded certificates of appreciation to fourty one (41) trainers.

Sistem Pendaftaran Profesional Alam Sekitar Bertauliah Kebangsaan (NRCEP)

Sistem NRCEP telah dibangunkan pada tahun 2014 untuk memudahkan urusan pengumpulan maklumat/ data *Continuing Professional Development* (CPD) oleh Orang Yang Berwibawa (OYB), dan boleh dipantau secara atas talian. Pada tahun 2016, penambahbaikan telah dibuat bagi Modul Kemasukan CPD, Modul Program CPD dan Modul Penyedia Latihan untuk meningkatkan lagi keupayaan Sistem NRCEP tersebut.

Sistem NRCEP juga berperanan menyokong pelaksanaan Pematuhan Kendiri di kalangan industri.
Sistem NRCEP boleh diakses melalui capaian http://eimas.doe.gov.my/

National Registry Of Certified Environmental Professional (NRCEP) System

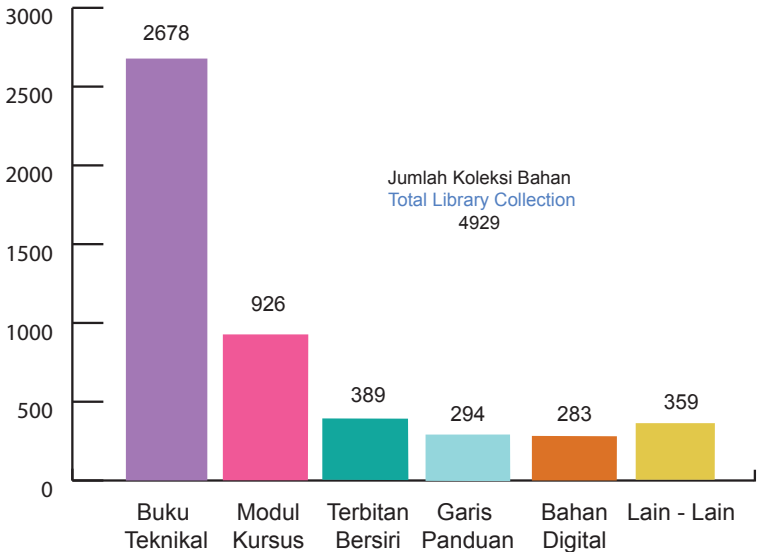
The NRCEP System was developed in 2014 to ease the management of information/ data pertaining to the collection of Continuing Professional Development (CPD) submitted by Competent Persons (CP), and can be monitored online. In order to improve the capability of the NRCEP System, enhancement of system has been made in 2016 for modules of CPD Submission, CPD Program and Training Provider.

The NRCEP system also serves as a support system in the implementation of Self-Regulation by industries.
The NRCEP System can be accessed at http://eimas.doe.gov.my/

COMPETENT PERSON

There are 2109 competent persons certified by EiMAS. They hold a total of 2309 certificates as follows:

1297	CePSWaM
437	CePIETSO(PCP)
309	CePIETSO(BP)
83	CePSO
96	CePBFO
50	CePSTPO
37	CePPOME



Rajah 8.8 JAS : Pecahan Koleksi Bahan Perpustakaan EiMAS

Figure 8.8 DOE: EiMAS Library Collection Breakdown

Perpustakaan EiMAS

Sepanjang tahun 2017, 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 4,929 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 2017, 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 4,929 titles or entries covering technical books, course modules, serials/ journals, guidelines and others collection.

Aktiviti dan Program Perpustakaan EiMAS Sepanjang Tahun 2017
EiMAS Library Activities And Programmes for The Year 2017

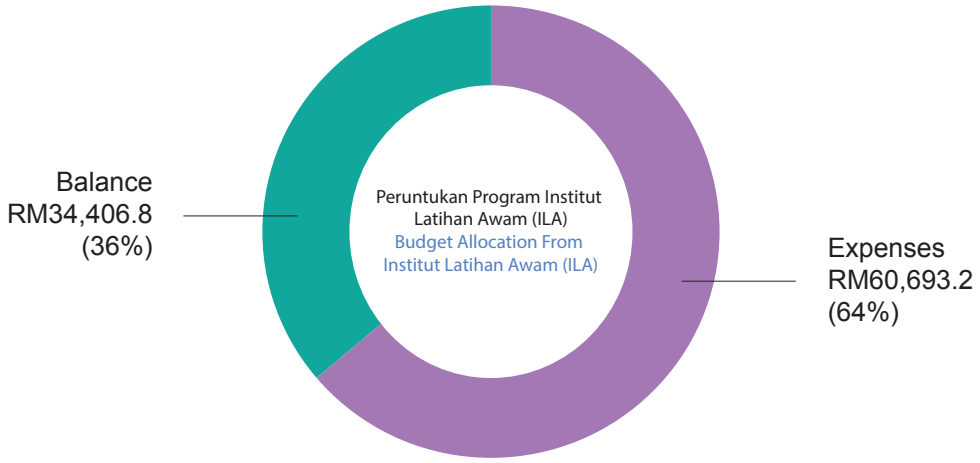
Bil. No.	Aktiviti/ Program Activities/ Programme	Tarikh Date
1.	Bengkel EKMC dan EMuseum Siri I di Hotel Bangi Putrajaya Training on EKMC & EMuseum at Bangi Putrajaya Hotel	17-18 Mei 2017
2.	Gotong Royong Perpustakaan untuk Projek Menaiktaraf EiMAS	Mei 2017
3.	Lawatan Informasi ke Pesta Buku Antarabangsa Kuala Lumpur Informative Visit to Kuala Lumpur International Book Fair	28 April 2017
4.	Anugerah Icon Membaca EiMAS EiMAS Reading Icon Award	9 June 2017
5.	Program Jom Baca Bersama untuk 10 Minit	25 April 2017
6.	Bengkel EKMC dan EMuseum Siri II di RHR Hotel@UNITEN Training on EKMC & EMuseum Series II at RHR Hotel@UNITEN	23-25 October 2017
7.	Menerbitkan e-Buletin EiMAS Bil.1 dan Bil.2 /2017 Published e-Buletin EiMAS	Quarterly
8.	Menerbitkan info@Perpustakaan EiMAS Bil.1/2017 Published info@Perpustakaan EiMAS	November 2017
9.	Pameran Buku-Buku Teknikal oleh Penerbit Buku Technical Books Exhibition by Publisher	15 June 2017

Pengurusan Kewangan EiMAS

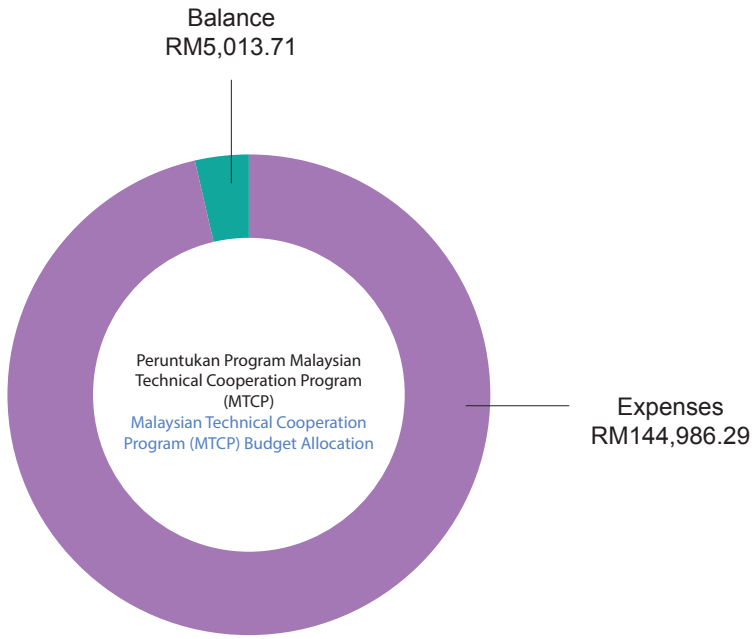
Pada tahun 2017, jumlah peruntukan yang diterima oleh EiMAS dari Jabatan Perkhidmatan Awam (Program ILA-Institut Latihan Awam) adalah sebanyak RM 95,100 pada tahun 2017. Perbelanjaan bagi program ini adalah sebanyak RM 60,693.20 bersamaan 64% sehingga Oktober 2017 (Penutupan Akaun).

EiMAS Finance Management

In year 2017, Jabatan Perkhidmatan Awam has allocate RM95, 100.00 for ILA (Institut Latihan Awam) Program to EiMAS. Out of this figure, RM 60,693.20 equivalent to 64% being used as expenses for this program until end of October 2017(Closing account).



Rajah 8.9 JAS : Peruntukan Program Institut Latihan Awam (ILA)
Figure 8.9 DOE : Budget Allocation From Institut Latihan Awam (ILA)



Rajah 8.10 JAS : Peruntukan Program Malaysian Technical Cooperation Program (MTCP)
Figure 8.10 DOE : Malaysian Technical Cooperation Program (MTCP) Budget Allocation

Jumlah peruntukan yang diterima dari Wisma Putra dibawah program Kerjasama Teknikal Malaysia (MTCP) adalah sebanyak RM 150,000.00 pada tahun 2017. Perbelanjaan bagi program ini adalah sebanyak RM 144,986.29 bersamaan 97%. Baki sebanyak RM 5,013.71 telah dipulang kan kepada WISMA Putra dan menjadikan peratusan perbelanjaan akhir sebanyak 100%.

Wisma Putra has allocate RM 150,000.00 for Malaysian Technical Cooperate Program (MTCP). Out of this figure, RM 144, 986.29 equivalent to 97% being used as expenses for this program. Balance amount of RM5, 013.71 was refund to Wisma Putra and make total percentage for expenses equal to 100%.

Pengurusan Sumber Manusia EiMAS
EiMAS Human Resource Management

Jumlah perjawatan EiMAS sehingga 31 Disember 2017 adalah 50 perjawatan dengan perincian berikut:
Total posts in EiMAS as of 31st December 2017 are 50 posts as following details:

BIL	JAWATAN	GRED	BIL. JAWATAN	DIISI	KOSONG
1	PENGARAH, PEGAWAI KAWALAN ALAM SEKITAR	C54	1	1	-
2	KETUA PENOLONG PENGARAH, PEGAWAI KAWALAN ALAM SEKITAR	C48	7	6	1
3	PENOLONG PENGARAH, PEGAWAI KAWALAN ALAM SEKITAR	C44	2	2	-
4	PENOLONG PENGARAH, PEGAWAI KAWALAN ALAM SEKITAR	C41/C44	5	5	-
5	PEGAWAI TEKNOLOGI MAKLUMAT	F41/F44	1	-	1
6	PUSTAKAWAN (Jawatan Kader, Perpustakaan Malaysia)	S41/S44	1	1	-
7	PENOLONG PEGAWAI KAWALAN ALAM SEKITAR	C32	8	8	-
8	PENOLONG PEGAWAI TADBIR	N32	1	1	-
9	PENOLONG PEGAWAI TEKNOLOGI MAKLUMAT (TBK 13 TAHUN)	F29/F32	1	1	-
10	PENOLONG JURUTERA (TBK 13 TAHUN) (Jawatan Kader Jabatan Kerja Raya)	JA29/30/ JA36	1	3	-
11	PENOLONG KAWALAN ALAM SEKITAR (TBK 13 TAHUN)	C29/C32	3	2	-
12	PENOLONG PERPUSTAKAAN (TBK 13 TAHUN) (Jawatan Kader Perpustakaan Negara Malaysia)	S29/S32	1	1	-
13	PENOLONG AKAUNTAN (TBK 13 TAHUN) (Jawatan Kader Jabatan Akauntan Negara)	W29/ W32	1	1	-
14	PEMBANTU KHAS, PEMBANTU SETIAUSAHA PEJABAT/ SETIAUSAHA PEJABAT	N30/N29/ N19/N22	1	-	1
15	PEMBANTU TADBIR (PERKERANIAN/ OPERASI)	N22	1	1	-
16	PEMBANTU TADBIR (PERKERANIAN/OPERASI)(TBK 13 TAHUN)	N19/N22	4	4	-
17	PEMBANTU TADBIR (KEWANGAN)(TBK 13 TAHUN)/ PENOLONG AKAUNTAN	W19/W22/ W29	2	2	-
18	PEMBANTU PUSTAKAWAN (TBK 13 TAHUN) (Jawatan Kader Perpustakaan Negara Malaysia)	S19/S22	1	1	-
19	PENYELIA ASRAMA (TBK 13 TAHUN)	N19/N22	1	1	-
20	PEMBANTU OPERASI (TBK 13 TAHUN)	N11/N14	2	2	-
21	PEMANDU KENDERAAN (TBK 13 TAHUN)	H11/H14	2	2	-
22	PEMBANTU AWAM (TBK 13 TAHUN)	H11/H14	1	1	-
JUMLAH			**50**	**47**	**3**

Penganjuran Bengkel dan Latihan Oleh EiMAS
Workshop and Training Organised By EiMAS

Peserta Kursus *Certified Professional In Leachate Treatment Plant Inspection* (CePLTPI)
Participants of Certified Professional In Leachate Treatment Plant Inspection (CePLTPI)

Sesi Peperiksaan Bertulis Kursus *Certified Professional In Palm Oil Mill Effluent Treatment System Inspection*
Certified Professional In Palm Oil Mill Effluent Treatment System Inspection Course Exam Session

Kursus *Certified Environmental Professional In Scrubber Inspection* (CePSI), 23 Januari hingga 27 Januari 2017
Certified Environmental Professional In Scrubber Inspection (CePSI), 23rd January to 27th January, 2017

Program Sangkutan *An Introduction To The Execution of CEMS In Industries*; 17 Julai hingga 19 Julai 2017
Attachment Programme on An Introduction To The Execution of CEMS In Industries; 17th July to 19th July, 2017

Program Sangkutan di Pelabuhan Johor
Attachement Programme at Johor Port

Kursus Pemahaman dan Kemahiran Tangkapan Mengikut Undang-Undang Peringkat Lanjutan di Nur Laman Bestari Eco-Resort, Batu Caves,
Selangor pada 8 Mei hingga 12 Mei 2017
Advanced Level Course on Understanding and Arrestment Skills According to Law at Nur Laman Bestari Eco-Resort, Batu Caves,Selangor on 8th May to 12th May, 2017

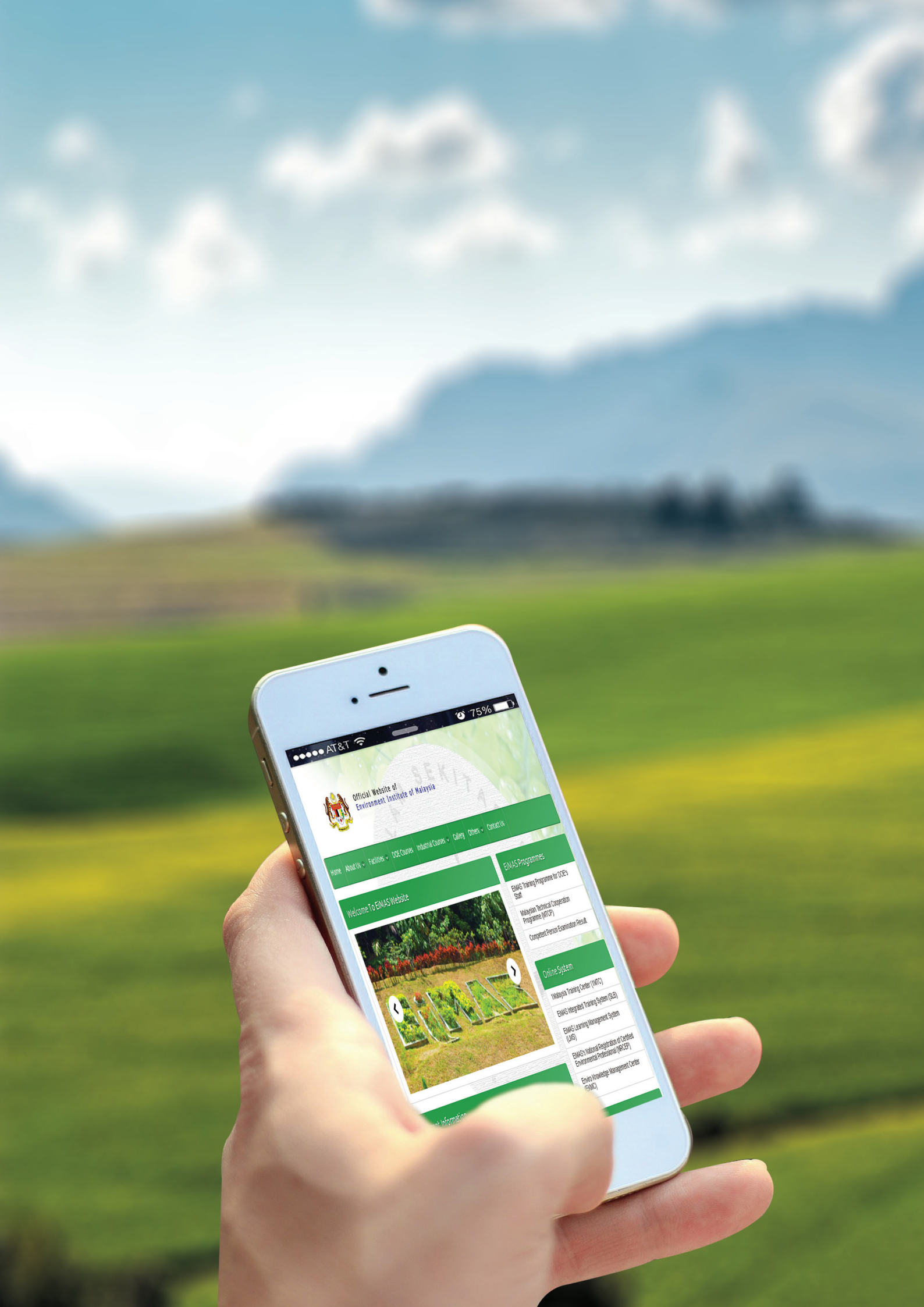
Kursus *DOE Uplifting Services Program: Record Keeping Application (Series II)* pada 20 Mac hingga 23 Mac 2017 di Hotel RHR@UNITEN, Kajang, Selangor: Lawatan Pembelajaran ke Industri bagi Pengurusan Simpanan Rekod
Course on DOE Uplifting Services Program: Record Keeping Application (Series II) on 20th March to 23rd March, 2017 at RHR Hotel@UNITEN, Kajang, Selangor: Industrial Study Visit for Record Keeping Management

Peserta *Malaysian Technical Cooperation Programme (MTCP) Course on Environmental Management and Pollution Control*
Participants of Malaysian Technical Cooperation Programme (MTCP) Course on Environmental Management and Pollution Control

Malaysian Technical Cooperation Programme (MTCP) Course on Environmental Management and Pollution Control pada 24 Julai hingga 4 Ogos 2018
Malaysian Technical Cooperation Programme (MTCP) Course on Environmental Management and Pollution Control pada 24th July to 4th August 2018

Kursus *Train The Trainer* : 11 September hingga 15 September 2017, Hotel Quality City Centre, Kuala Lumpur
Train The Trainer Course : 11th September to 15th September, Quality City Centre Hotel, Kuala Lumpur

Kursus *Diplomatic Communication* : 25 April hingga 28 April 2017, Hotel Wana Riverside, Melaka
Course on Diplomatic Communication 25th April to 28th April, 2017, Wana Riverside Hotel, Melaka


AT&T
75%
Official Website of
Environment Institute of Malaysia
Home
About Us
Facilities
DOE Courses
Industrial Courses
Gallery
Others
Contact Us
Welcome To EIMAS Website
EIMAS Programmes
EIMAS Training Programme for DOE's Staff
Malaysian Technical Cooperation Programme (MTCP)
Competent Person Examination Result
Online System
Malaysia Training Center (MTC)
EIMAS Integrated Training System (SLB)
EIMAS Learning Management System (LMS)
EIMAS National Registration of Certified Environmental Professional (NRCEP)
Enviro Knowledge Management Center (EKMC)

BAB 9
CHAPTER 9

MENGARUSPERDANA AMALAN INDUSTRI HIJAU DALAM KALANGAN PERUSAHAAN KECIL DAN SEDERHANA (PKS) KE ARAH PERTUMBUHAN HIJAU
MAINSTREAMING GREEN INDUSTRY PRATICES AMONG SMALL AND MEDIUM ENTERPRISES (SME) TOWARDS GREEN GROWTH

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 untuk dilaksanakan pada tahun 2017 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*);

3. Menerapkan budaya pematuhan kendiri terkawal dan mewujudkan PKS yang berdaya saing dan mesra alam;

4. Meningkatkan pematuhan PKS terhadap keperluan perundangan alam sekitar;

5. Meningkatkan penggunaan sumber secara lestari selaras dengan 2030 Agenda for Sustainable Development Goals (SDG).

Mainstreaming Green Industry Practices Among Small And Medium Enterprises (SME) Towards Green Growth

Under the Eleventh Malaysia Plan (RMKe11) Green Industry Unit (GIU) DOE has planned various programmes and projects to be implemented in 2017 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, GIU is committed to deliver its RMKe11 programme aims to strengthen Green Industry practices among Small and Medium Industries towards sustainable production and reducing Green House Gases emission.

The objectives of the programme 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. 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).

Berikut projek dan aktivti yang telah dilaksanakan pada tahun 2017:

Those are the projects and activities undertaken in 2017:

Program Penyelidikan dan Pembangunan (R&D) Premis Demonstrasi Amalan Industri Hijau

Research and Development (R&D) of Green Industry Demonstration premises

Objektif utama program adalah untuk membangunkan premis demonstrasi Amalan Industri Hijau yang akan menjadi contoh dan galakkan terutama kepada Perusahaan Kecil dan Sederhana (PKS) untuk melaksanakan amalan Industri Hijau di dalam operasi premis masing-masing. Sebuah buku garis panduan pelaksanaan amalan Industri Hijau bagi sektor terpilih juga diterbitkan untuk rujukan dan panduan pihak industri.

The main objective of the programme 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. Green Industry Implementation Guideline for specific sector was developed and published as guidance and references for other industry.

Pada tahun 2017 program Penyelidikan dan Pembangunan (R&D) Premis Demonstrasi Amalan Industri Hijau di teruskan dengan fasa dua projek Latihan Pengeluaran Bersih (CP) Untuk Pembangunan Premis Demonstrasi Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam.

In 2017, Research and Development (R&D) Program of Green Industry continue with phase two project under program “Latihan Pengeluaran Bersih (CP) Untuk Pembangunan Premis Demonstrasi Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam”.

Di antara aktiviti dibawah fasa dua program adalah seperti berikut:

The activities under phase two program includes:

1. Membangunkan buku Garis Panduan Pelaksanaan Amalan Industri Hijau Sektor Makanan Bagi Premis Penyembelihan dan Pemprosesan Ayam.

1. Developed Guidelines entitle “Garis Panduan Pelaksanaan Amalan Industri Hijau Sektor Makanan Bagi Premis Penyembelihan dan Pemprosesan Ayam”.

2. Menganjurkan lawatan teknikal ke premis demonstrasi Amalan Industri Hijau dan seminar Amalan Industri Hijau bagi Premis Penyembelihan dan Pemprosesan Ayam.

2. Organizing a technical visit to Green Industry Demonstration Premises and Seminar on Green Industry Practices for Chicken Slaughterhouse and processing.

Semua aktiviti telah dilaksanakan mengikut jadual dan mencapai objektif yang telah disasarkan.

All the above activities were successfully implemented and the projected objective is achieved.

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 Perusahaan Kecil dan Sederhana (PKS) mengenai konsep Pengeluaran Bersih

Bagi tahun 2017, program ini telah dilaksanakan oleh pihak perunding yang dilantik iaitu Dr. Tenaga Solution. **Jadual 9.1** menunjukkan lima (5) buah premis PKS terpilih di sekitar Negeri Perak telah menyertai program ini. Melalui program ini, latihan dan pendedahan berkaitan konsep Pengeluaran diberikan kepada pekerja PKS yang dipilih oleh pihak pengurusan PKS sendiri dan seterusnya pekerja PKS 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.

Peserta 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.

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 2017 the Cleaner Production Training for SMEs towards Development of Green Industry Demonstration Site program was carried out in collaboration with Dr Tenaga Solution. As shown in **Table 9.1** five (5) SME premises in Perak 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.

SME participants 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.

Memperkukuhkan Mekanisma Institusi Industri Hijau

Strenghtening Green Industry Institutional Mechanisms

Program Promosi Meja Bantuan Industri Hijau Dan Penubuhan Meja Bantuan Industri Hijau di Pejabat-Pejabat JAS Negeri

Promotion of Green Industry Helpdesk and the establishment of a Green Industry Helpdesk at DOE State Offices

Salah satu komponen Program `Memperkasakan Amalan Industri Hijau Dalam Kalangan Perusahaan Kecil dan Sederhana (PKS) Ke Arah Pertumbuhan Hijau' di bawah Rancangan Malaysia Kesebelas (RMKe-11) adalah Memperkukuhkan Mekanisma Institusi Industri Hijau.

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.

Mewujudkan Meja Bantuan (*helpdesk*) Industri Hijau di semua JAS Negeri adalah salah satu elemen dalam program tersebut. Pada tahun 2017, Unit Industri Hijau Ibu Pejabat telah membuat perolehan enam (6) unit meja bantuan dan *pop up banner* dalam membantu JAS Negeri mempromosi Industri Hijau.

One of the element of this programme is to create Green Industry help desk for all of state office. In 2017, Green Industry Unit at Headquaters has made the acquisition of six (6) unit helpdesk and popup banner to help state office in promoting Green Industry.

Meja Bantuan tersebut telah diagihkan kepada lima buah negeri iaitu Selangor, Kuala Lumpur, Melaka, Negeri Sembilan, Johor dan Cawangan Kluang, Johor. Melalui Meja Bantuan ini di pejabat JAS Negeri akan memberi nasihat dan maklumat yang lebih tepat kepada industri untuk melaksanakan Amalan Industri Hijau.

The helpdesk has been allocated to five states namely Selangor, Kuala Lumpur, Melaka, Negeri Sembilan, Johor and Branch Kluang, Johor. With Green Industry Helpdesk, DOE state offices will be able to provide more accurate advice and information on implementation of Green Industry Practices.

Seminar Amalan Industri Hijau Bagi Premis Penyembelihan dan Pemprosesan Ayam.

Seminar Green Industry for Chicken Slaughterhouse and Processing.

Pada penghujung tahun 2017, Projek Latihan Pengeluaran Bersih (CP) Untuk Pembangunan Premis Demonstrasi Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam di bawah program Penyelidikan dan Pembangunan (R&D) telah jaya beroperasi. Satu seminar telah dianjurkan bagi tujuan mempromosikan hasil projek tersebut kepada pegawai JAS dan juga pengusaha-pengusaha premis penyembelihan dan pemprosesan ayam,.

At the end of year 2017, project "Latihan Pengeluaran Bersih (CP) Untuk Pembangunan Premis Demonstrasi Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam" under Research and Development (R&D) programme was succesfuly completed and in operational. A seminar was organized to promote the project outcome among DOE Officers and also enterprenuer in chicken slaughterhouse and processing.

Seminar Amalan Industri Hijau Bagi Premis Penyembelihan dan Pemprosesan Ayam telah berlangsung pada 26 September 2017 bertempat di Hotel Prime City, Kluang, Johor. Seminar ini telah dirasmikan oleh Timbalan Ketua Pengarah (Pembangunan) JAS iaitu Tn. Haji Ismail bin Ithnin.

Seminar Green Industry for Chicken Slaughterhouse and Processing was held on 26th September 2017 at Prime City Hotel, Kluang, Johor. The seminar was officiated by Tuan Haji Ismail bin Ithnin, Deputy Director General (Development), DOE.

Sebanyak tiga (3) kertas kerja telah dibentangkan oleh 3 penceramah iaitu penceramah pertama iaitu Pn. Zuraini Siam, Ketua Unit Industri Hijau yang membentangkan kertas kerja bertajuk Program Latihan Industri Hijau Ke Arah Pembangunan Premis Demonstrasi Amalan Industri Hijau dan Faedahnya kepada Perusahaan Kecil dan Sederhana (PKS). Pembentang kedua iaitu En. Saiful Azam Bin Hj. Mahmud daripada SIRIM Berhad membentangkan kertas kerja bertajuk Program Latihan Pengeluaran Bersih (CP) ke Arah Pembangunan Premis Demonstrasi Amalan Industri Hijau untuk Premis Penyembelihan dan Pemprosesan ayam– Hasil kajian dan cadangan Opsyen Industri Hijau. Manakala penceramah ketiga iaitu Tn. Hj. Ir. Zulkafli B. Mat Rani, Pengurus Besar PPNJ Poultry & Meat Sdn Bhd telah membentangkan kertas kerja bertajuk Perkongsian Pengalaman Industri dalam Program Latihan Industri Hijau.

Three (3) paperworks were presented by three (3) speakers, the first speaker was Pn. Zuraini Siam, Head of Green Industry Unit who presented a paper entitle Training Program on Green Industry Towards Development of Green Industry Demonstration Premises and Its Benefits for Small and Medium Enterprises. The second speakers is En. Saiful Azam Bin Hj. Mahmud from SIRIM Berhad who presented a paper on Research Outcome and Green Industry Options from a study on Chicken Slaughterhouse and Processing Industry. The third speaker is Tn. Hj. Ir. Zulkafli B. Mat Rani, the General Director of PPNJ Poultry and Meat Sdn. Bhd. who presented paper on Industry Experience Sharing In Green Industri Training Program.

Disamping itu aktiviti bengkel ini juga melibatkan sesi lawatan teknikal ke premis demonstrasi Amalan Industri Hijau sektor makanan bagi premis penyembelihan dan pemprosesan ayam iaitu syarikat PPNJ Poultry & Meat Sdn Bhd sendiri. Peserta dibawa melihat model loji biodigester yang telah dibangunkan bagi penghasilan biogas menggunakan efluen dan bahan buangan dari operasi penyembelihan dan pemprosesan ayam. Penerangan tentang loji biodigester telah disampaikan oleh pegawai JAS, pihak SIRIM Berhad dan Pengurus Besar PPNJ Poultry & Meat Sdn Bhd.

This seminar also involves a technical visit to Green Industry Demonstration Premises for Chicken Slaughterhouse and Processing Industry which is located at PPNJ Poultry and Meat Sdn. Bhd. The participants were brought to see the model of the biodigester plant that was developed to produce biogas using effluents and waste from slaughter and processing of chicken. The explanation were given by DOE officer , SIRIM Berhad expert and also factory General Manager of PPNJ Poultry and Meat Sdn. Bhd.

Peserta seminar adalah terdiri daripada 50 pegawai JAS daripada pejabat JAS Negeri Johor, Melaka, Negeri Sembilan dan Selangor termasuk EiMAS. Manakala peserta industri pula adalah seramai 200 orang.

Seminar participants consist of 50 DOE officers from Johor, Melaka, Negeri Sembilan dan Selangor including EiMAS. Meanwhile about 200 participants were from SMEs

Pameran dan Promosi Industri Hijau

Green Industry Promotion and Exibitions

UIH telah mengadakan dua (2) pameran sepanjang tahun 2017. Pameran yang diadakan adalah jemputan daripada Fakulti Sains Sosial Universiti Kebangsaan Malaysia (UKM) sempena program *Eco-Green Campus Challenge 2.0* pada 20 April 2017 dan jemputan daripada Fakulti Kejuruteraan dan Alam Bina (UKM) sempena penganjuran persidangan *Tuanku Jaafar Conference and Workshop 2017* pada 20 November hingga 23 November 2017.

GIU had organized two(2) exhibitions in 2017. The exibitions was an invitation from Faculty of Social Science, National University Malaysia (UKM) inconjuction of Eco-Green Campus Challenge 2.0 held on 20 April 2017 and the second exhibition was invitation from Faculty of Engineering and Built Environment (UKM) inconjunction of Tuanku Jaafar Conference and Workshop held on 20th November to 23rd November, 2017.

Program Anugerah Industri Hijau Tahun 2017

Anugerah Industri Hijau merupakan anugerah yang diperkenalkan bagi memberi pengiktirafan kepada Perusahaan Kecil dan Sederhana (PKS) ke atas inisiatif melaksanakan Amalan Industri Hijau

Objektif utama anugerah ini adalah untuk memberikan pengiktirafan dan motivasi khususnya kepada PKS atas inisiatif, kreativiti dan komitmen berterusan yang diberikan dalam pelaksanaan Amalan Industri Hijau serta mengadaptasikan elemen pengeluaran bersih (*cleaner production*) dalam proses pembuatan.

Manfaat pelaksanaan Amalan Industri Hijau ini ialah penjimatan penggunaan tenaga dan utiliti dan pengurangan sisa buangan yang menjurus kepada proses pengeluaran industri yang lebih bersih dan efisen ini secara tidak langsung boleh menyumbang kepada *low carbon footprint* selaras dengan hasrat negara untuk mengurangkan intensiti pelepasan gas rumah hijau (*Greenhouse gas - GHG*) sebanyak 45% daripada Keluaran Dalam Negara Kasar (GDP) menjelang 2030 berbanding intensiti pelepasan pada tahun 2005.

Pada tahun 2017, penyertaan dibuka kepada semua PKS di Malaysia bagi menyertai Program Anugerah Industri Hijau dan majlis penganugerahan akan diadakan pada tahun 2018.

Roadshow dan taklimat berkenaan program tersebut juga diadakan di JAS Negeri Perak sebagai pendekatan untuk mempromosikan Program Anugerah Industri Hijau kepada PKS.

Green Industry Award Program 2017

Green industry award is an award which was introduced to give recognition to small and medium enterprises (SMEs) for their initiative in implementing Green Industry Practices.

The main objective of this award is to give recognition and motivation in particular to SMEs on the initiative, creativity and continuous commitment in the implementation of Green Industry Practices and adoption of cleaner production concept in the manufacturing process.

Benefits of implementing Green Industry Practices are saving energy and utilities, and reducing wastes leading to cleaner and more efficient industrial production processes. This indirectly contribute to low carbon footprint in line with the countries commitment to reduce the intensity of greenhouse gas (GHG) emissions of 45% based on the gross domestic product (GDP) by 2030 based on intensity of emissions in 2005

In 2017, participation was open to all SMEs in Malaysia to participate in the Green Industry Award Program to be held in 2018.

Roadshow and briefing on the Program were also held at the DOE Perak as an approach to promote the Green Industry Award Program to SMEs.

Jadual 9.1 JAS: Senarai Premis Bagi Program Latihan Pengeluaran Bersih (CP) Kepada PKS
Table 9.1 DOE: List of Premises in CP Training Program for SME

Bil. No	Premis Premises	Tarikh Datew	Bilangan opsyen CP dijana No of CP option
1.	FY Food Processing Sdn. Bhd. Ipoh	2 Jun 2017/ 2 June 2017	7
2.	M&S Food Industries, Ipoh	2 Jun 2017/ 2 June 2017	9
3.	S&P Industries, Bagan Datoh	2 Jun 2017/ 2 June 2017	11
4.	Ayam AA Enterprise Sdn. Bhd	6 Oktober 2017/ 6 October 2017	10
5.	PCK Enterprise	6 Oktober 2017/ 6 October 2017	10

Bil.	Tarikh	Nama Syarikat / Organisasi / Program	Lokasi	Catatan
1.	28 Februari 2017	Bengkel Memperkukuh Mekanisma Institusi Industri Hijau Melalui Pemantapan Program Industri Hijau di JAS Negeri Workshop on Strengthening the Mechanism of Green Industry Institutions through the Strengthening of Green Industry Programs in State Offices	Hotel rhr Uniten Selangor	Seminar kepada pegawai JAS dan pihak industri Seminar for DOE officers and industry
2.	5 September 2017	Roadshow Dan Taklimat JAS Negeri Roadshow And DOE State Briefing.	Jabatan Alam Sekitar Negeri Sembilan	Seminar kepada pegawai JAS dan pihak industri. Seminar for DOE officers and industry
3.	25 September 2017	Seminar Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam Seminar Green Industry Practices for Poultry Slaughterhouse And Processing Premises	Hotel Prime City, Kluang Johor	Seminar kepada pegawai JAS dan pihak industri. Seminar for DOE officers and industry
4.	24-27 Oktober 2017	Bengkel Pembangunan Sistem Pelaporan Atas Talian (*Online*) Industri Hijau Workshop Development of Green Industry online reporting system	Hotel Dorsett, Putrajaya	Bengkel pegawai JAS Workshop for DOE officers

Program Khidmat Nasihat kepada PKS di Negeri Perak
Green Industry Advisory Services For SMEs in State of Perak

- Lawatan Ke Premis Pembuatan Makanan
  A Visit To Food Industry

Program Seminar Memperkukuhkan Pegawai JAS Dalam Institusi Industri Hijau
Workshops of Strengthen the Mechanism of Green Institution



Program Promosi Unit Industri Hijau
Green Industry Promotion Program

- Perasmian Seminar Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam Yang Berlangsung Pada 26 September 2017 Oleh Timbalan Ketua Pengarah (Pembangunan) JAS.

  The Opening Ceremony Of Seminar On Green Industry Practices For Chicken Slaughterhouse And Processing Premises On 26th September, 2017, By Deputy Director General (Development) Of DOE.

- Peserta Yang Hadir Seminar Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam Yang Berlangsung Pada 26 September 2017.

  Participants At Seminar On Green Industry Practices For Chicken Slaughterhouse And Processing Premises Held On 26th September, 2017.


Lawatan Teknikal Peserta Seminar Ke Tapak Projek Demontrasi Amalan Industri Hijau Bagi Premis Penyembelihan Dan Pemprosesan Ayam Di PPNJ Poultry And Meat Sdn. Bhd.

A Technical Visit By Participants Of Seminar To Green Industry Demonstration For Chicken Slaughterhouse And Processing Premises At PPNJ Poultry And Meat Sdn. Bhd.

Penyertaan Pada Pameran Sempena Program *Eco-Green Campus Challenge* 2.0 Anjuran Fakulti Sains Sosial UKM Pada 20 April 2017

Participation In Exhibition In Conjunction With Eco Green Campus Challenge 2.0 Organized By Faculty Of Social Science UKM On 20th April, 2017

Penyertaan Pada Pameran Sempena Persidangan *Tuanku Jaafar Conference And Workshop 2017* Pada 20 November Hingga 23 November 2017 Anjuran Fakulti Kejuruteraan Dan Alam Bina UKM

Participation In Exhibition In Conjuction Of Tuanku Jaafar Conference And Workshop 2017 On 20th November To 23rd November, 2017 Organized By Faculty Of Engineering And Built Environment UKM

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