Laporan Tahunan

2011

Annual Report

Jabatan Alam Sekitar
Kementerian Sumber Asli dan Alam Sekitar

Department of Environment
Ministry of Natural Resources and Environment

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Kandungan / Contents

Prakata / Foreword 8
Visi / Vision 10
Misi / Mission 10
Strategi / Strategic 10

Bab 1 / Chapter 1 11

- Majlis Kualiti Alam Sekeliling (EQC)
  Environmental Quality Council (EQC) 12

Bab 2 / Chapter 2 15

- Pengurusan Sumber Manusia Dan Kewangan
  Human Resources and Financial Management 16

Bab 3 / Chapter 3 23

- Penilaian Kesan Kepada Alam Sekeliling dan Input Kepada Perancangan Pembangunan
  Environmental Impact Assessment and Input for Development 24

Bab 4 / Chapter 4 39

- Pengawasan Kualiti Udara / Air Quality Monitoring 40
- Program Pencegahan Kebakaran Dan Pengurusan Tanah Gambut
  Fire Prevention And Peatland Management Programme 43
- Protokol Montreal Perlindungan Lapisan Ozon
  Montreal Protocol for the Protection of Ozone Layer 47
- Kawalan Terhadap Premis Yang Ditetapkan / Control of Prescribed Premises 53
- Kawalan Terhadap Premis Yang Bukan Ditetapkan / Control of Non-Prescribed Premises 57
- Pengawasan Kualiti Air Marin / Marine Water Quality Monitoring 62
- Pengawasan Kualiti Air Marin Pulau-Pulau / Island Marine Water Quality Monitoring 72
- Program Pengawasan Kualiti Air Daratan (Sungai) /
  Surface Water (River) Quality Monitoring Programme 77
- Pemantauan Kualiti Air Tanah / Groundwater Quality Monitoring 94
- Rancangan Kontigensi Kebangsaan Kawalan Tumpahan Minyak (RKKKTM) /
  National Oil Spill Contingency Plan (NOSCP) 97
- Jawatankuasa Tabung Pusingan Bagi Selat Melaka Dan Selat Singapura (RFC) /
  Straits of Malacca and Singapore Revolving Fund Committee (RFC) 99
- Pencemaran Marin / Marine Pollution 100

- Pengurusan Buangan Terjadual / Scheduled Wastes Management 101
- Skim Notifikasi Dan Pendaftaran Bahan-Bahan Berbahaya Alam Sekeliling (EHSNR) / Environmentally Hazardous Substance Notification and Registration Scheme (EHSNR) 104
- Penguatkuasaan Terhadap Aktiviti Pembakaran Terbuka Enforcement Against Open Burning Activities 105
- Punca-Punca Bergerak Kenderaan Bermotor / Mobile Sources (Motor Vehicles) 108
- Tindakan Undang-Undang / Legal Action 115
- Maklumat Terhadap Pengaduan Awam / Response to Public Complaints 117

Bab 5 / Chapter 5 119

- Promosi Kesedaran dan Pendidikan Alam Sekitar Promotion of Environmental Education and Awareness 120
- Sebaran Maklumat Alam Sekitar / Environmental Information Dissemination 137

Bab 6 / Chapter 6 141

- Hal-Ehwal Alam Sekitar Antarabangsa – Kerjasama Dua Hala International Environmental Affairs – Bilateral Cooperation 142
- Hal-Ehwal Alam Sekitar Antarabangsa – Kerjasama Serantau International Environmental Affairs – Regional Cooperation 143

Bab 7 / Chapter 7 145

- Bahagian Teknologi Maklumat / Information Technology Division 146

Bab 8 / Chapter 8 153

- Institut Alam Sekitar Malaysia (EiMAS) / Environment Institute of Malaysia (EiMAS) 154

Bab 9 / Chapter 9 165

- Teknologi Bersih / Cleaner Production 166

Singkatan / Abbreviations

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

Singkatan / Abbreviations

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

Singkatan / Abbreviations

Memorandum Persefahaman	MOU	Memorandum of Understanding
Majlis Pengeluar-Pengeluar Getah Malaysia	MRPC	Malaysia Rubber Products Manufacturers' Council
Jawatankuasa Bersama Malaysia-Singapura Mengenai Alam Sekitar	MSJCE	Malaysia – Singapore Joint Committee on the Environment
Pertubuhan Bukan Kerajaan	NGO	Non-Governmentnal Organisation
Kementerian Sumber Asli Dan Alam Sekitar	NRE	Ministry of Natural Resources and Environment
Amoniakal Nitrogen	NH_3N	Ammoniacal Nitrogen
Pertubuhan Kerjasama Ekonomi dan Pembangunan	OECD	Organisation for Economic Co-operation and Development
Pertubuhan Kerjasama Alam Sekitar bagi Laut Asia Timur	PEMSEA	Partnership in Environmental Management for the Seas of East Asia
Kebenaran Maklumat Awal	PIC	Prior Informed Consent
Persatuan Pekilang-Pekilang Minyak Kelapa Sawit Malaysia	POMA	Palm Oil Millers' Association
Institut Penyelidikan Minyak Kelapa Sawit	PORIM	Palm Oil Research Institute of Malaysia
Ringgit Malaysia	RM	Ringgit Malaysia
Institut Penyelidikan Getah Malaysia	RRIM	Rubber Research Institute of Malaysia
Urusetia Konvensyen BASEL	SBC	Secretariat for BASEL Convention
Agensi Pembangunan Antarabangsa Sweden	SIDA	Swedish International Development Agency
Institut Standard dan Penyelidikan Industri Malaysia	SIRIM	Standards Industrial Research Institute of Malaysia
Udara Bersih	UB	Clean Air
Universiti Islam Antarabangsa Malaysia	UIA	International Islamic University of Malaysia
Universiti Kebangsaan Malaysia	UKM	National University of Malaysia
Universiti Malaya	UM	University of Malaya
Persidangan Bangsa-Bangsa Bersatu Mengenai Alam Sekitar dan Pembangunan	UNCED	United Nations Conference on Environment and Development
Program Pembangunan Bangsa-Bangsa Bersatu	UNPD	United Nations Development Programme
Program Alam Sekitar Bangsa-Bangsa Bersatu	UNEP	United Nations Environment Programme
Universiti Tenaga Nasional	UNITEN	University of Tenaga Malaysia Nasional
Unit Perancang Ekonomi	UPE	Economic Planning Unit
Universiti Putra Malaysia	UPM	University of Putra Malaysia
Universiti Sains Malaysia	USM	University of Science Malaysia
Yang Berhormat	Y.B.	The Honourable
Polis Diraja Malaysia	PDRM	Royal Malaysian Police
Kandungan Organik Meruap	VOCs	Volatile Organic Compounds
Wilayah Kualiti Air	WQR	Water Quality Region

Prakata

Jabatan Alam Sekitar dengan sukacitanya membentangkan Laporan Tahunan yang merangkumi ruang lingkup kerja dan pencapaian pada tahun 2011.

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

Penekanan yang berterusan diberikan dalam usaha mencegah dan mengawal pencemaran air, pencemaran udara dan pengurusan buangan terjadual serta promosi amalan industri hijau. Pemeriksaan ke atas punca-punca pencemaran dipergiatkan dan tindakan undang-undang telah diambil ke atas mereka yang melakukan kesalahan. Di samping itu, pengawalan pelepasan atas talian bagi aktiviti kawalan kendiri telah dimulakan oleh pihak industri melalui CEMS dan MDMR.

Bermula tahun 2011 juga, aplikasi *Fire Danger Rating System* (FDRS) yang dibangunkan oleh Jabatan Meteorologi Malaysia (JMM) telah digunapakai bagi memperkemas sistem amaran awal mencegah kebakaran tanah gambut selain dari mekanisma pemantauan *hotspot*. Satu projek perintis telah dimulakan di Negeri Selangor bertujuan untuk mempertingkatkan keupayaan sistem dalam mencegah kebakaran gambut.

Pada tahun 2011 juga, JAS telah membuat penambahbaikan kepada aspek kawalan hakisan tanah dan sedimen dalam prosedur kajian kesan kepada alam sekeliling (EIA) dan proses-proses selanjutnya seperti Pelan Pengurusan Alam Sekitar

Foreword

The Department of Environment wishes to present the Annual Report which provides an account of its work and achievements for the year 2011.

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

Continued emphasis is given to the prevention and controlling of water pollution, air pollution and scheduled waste management as well as the promotion of green industrial practices. Inspections on polluting sources were stepped up and legal actions are taken against perpetrators. In addition, the self regulatory practices among industries have been introduced with online reporting through CEMS and MDMR.

To minimize or overcome land and forest fires remain a challenging task to DOE. In 2011, an application of the 'Fire Danger Rating System' (FDRS) was developed by the Malaysian Meteorological Department (MMD) as an alert system for prevention of peatland fires apart from hotspot monitoring. A pilot project was implemented in Selangor to further enhance the system to prevent peat fires.

In 2011, DOE enhanced the study of soil erosion and sediment control aspect in the environmental impact assessment (EIA) procedures and subsequent processes in the Environmental Management Plan (EMP), the conditions of approval and a list of relevant

(EMP), syarat-syarat kelulusan EIA dan senarai semak pemeriksaan langkah-langkah kawalan hakisan dan sedimen di tapak. Dalam pakej penambaikan ini, dokumen-dokumen berikut telah disediakan dan digunapakai mulai tahun 2011:

i. *Guidance Document for the Preparation and Submission of Environmental Management Plans(EMPs);*
ii. *Guidance Document for the Preparation of Erosion and Sediment Control Plans (ESCPs);* dan
iii. Syarat-Syarat Kelulusan EIA Berkaitan Kawalan Hakisan Tanah dan Sedimen.

Tahun 2011 merupakan satu tahun yang penuh dengan aktiviti serta peristiwa yang menarik. Antara pencapaian yang boleh dibanggakan untuk tahun ini termasuklah Johan Anugerah *NRE Goes Green* 2011, Johan Anugerah Mini Konvensyen 5S NRE 2011, Naib Johan Pertandingan Kumpulan Inovatif dan Kreatif Kategori Pengurusan dan tiga bintang dalam Penarafan Indeks Akauntabiliti oleh Jabatan Audit Negara bagi tahun 2010 yang mana proses pengauditan telah dilaksanakan pada awal tahun 2011. JAS juga telah diberikan penarafan lima bintang dan menduduki ranking ketiga bagi Kategori 10 Laman Web Tertinggi Keseluruhan dalam Penilaian Portal dan Laman Web Sektor Awam Kerajaan Malaysia (MGPWA) 2011 yang dianjurkan oleh Multimedia Corporation Sdn Bhd (MDEC).

Dalam usaha memberi kesedaran kepada orang awam secara berterusan, JAS melaksanakan program-program dan aktiviti-aktiviti kesedaran dan pendidikan alam sekitar serta penyebaran maklumat untuk pelbagai peringkat masyarakat sebagai usaha berterusan dan bersama dalam membangunkan masyarakat yang penyayang dan mesra alam di Negara ini. Perlindungan alam sekitar melalui amalan -amalan mesra alam seharusnya menjadi sebahagian aktiviti seharian kita.

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 lestari, sihat dan kualiti hidup yang lebih baik.

Salam Mesra Alam

EIA inspection checklist of erosion and sediment control measures on site. In this improvement package, the following documents have been prepared and adopted in 2011:

i. Guidance Document for the Preparation and Submission of Environmental Management Plans(EMPs);
ii. Guidance Document for the Preparation of Erosion and Sediment Control Plans (ESCPs); and
iii. EIA Approval Conditions Relating to Soil Erosion and Sediment Control.

Year 2011 was a year filled with exciting activities, events and achievements. Some of the achievements include, winner of NRE Goes Green Award 2011, winner of NRE 5S Mini Convention 2011, runners-up of the Innovative and Creative Group (Management Category) Competition 2011 and awarded 3-star rating for Accountability Index 2010 by the National Audit Department in which the audit process was implemented in early 2011. The Department of Environment's Website also was awarded a 5-star rating and ranked third under the Overall Top 10 Websites Category in the Malaysian Government Portals and Websites Assessment (MGPWA) 2011 organized by Multimedia Corporation Sdn Bhd (MDEC).

In an effort to create awareness among the public on an ongoing basis, DOE continued to implement its awareness and environmental education programmes and activities as well as disseminate information to various levels of the society towards building a caring and environmentally friendly society in the country. Protecting environment by adopting environmental friendly practices should be part and parcel of our daily activities.

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

Good Wishes For the Environment

Halimah Hassan
Ketua Pengarah Alam Sekitar Malaysia
Director-General of Environmental Quality Malaysia

Visi / Vission

Pemuliharaan Alam Sekitar Untuk Kesejahteraan Rakyat

Environmental Conservation for the Well-being of the People

Misi / Mission

Memastikan Pembangunan Lestari di dalam Proses Memajukan Negara

To Ensure Sustainable Development in the Process of Nation Building

Strategi / Strategies

- Pembangunan Lestari melalui Pemuliharaan Sumber Semulajadi
  Sustainable Development through Conservation of Resources
- Integrasi Faktor Alam Sekitar dalam Perancangan Pembangunan
  Integration of Environmental Factors in Development Planning
- Pencegahan dan Kawalan Pencemaran
  Pollution Prevention and Control
- Promosi Pendidikan dan Kesedaran Alam Sekitar
  Promotion of Environmental Education and Awareness
- Kerjasama antara Agensi dan Persekutuan Negeri
  Inter-Agency and Federal-State Cooperation
- 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)
ENVIRONMENTAL QUALITY COUNCIL (EQC) ACTIVITIES

Dalam tahun 2011, Majlis Kualiti Alam Sekeliling telah bermesyuarat untuk kali ke 108 pada 21 Mac 2011.

Mesyuarat ini telah diadakan di Bilik Cempaka, Tingkat 3, Pejabat Jabatan Alam Sekitar, Putrajaya dan telah dipengerusikan oleh Y.Bhg. Prof. Dato' Ir. Dr. Zaini Bin Ujang, Naib Canselor, Universiti Teknologi Malaysia.

Pada bulan April 2011, Y.Bhg. Datuk Suzannah Liaw yang mewakili Kerajaan Negeri Sabah telah bertukar ke Kementerian Belia dan Sukan Sabah dan tempat beliau telah digantikan oleh Y.Bhg Datuk Michael Emban. Bermula dari bulan Ogos 2011, Encik Abdul Aziz Bin Long telah dilantik mewakili pertubuhan yang berpengalaman berhubung alam sekitar menggantikan Encik Peter Ho manakala Encik K.N Gobinathan telah dilantik sebagai Ahli Giliran mewakili Persekutuan Pekilang-Pekilang Malaysia (FMM) menggantikan Encik Mohamad Dit.

EQC merakamkan penghargaan kepada Y.Bhg. Datuk Suzannah Liaw, Encik Peter Ho dan Encik Mohamad Dit di atas sumbangan mereka dan mengalu-alukan kehadiran ahli baru.

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

Perbincangan EQC ke 108
(Tarikh: 21 Mac 2011)

1. Kertas EQC Bil.1/108/2011
   Kertas oleh Jabatan Alam Sekitar
   - Kertas Perbincangan:
     Cadangan Peraturan-Peraturan Kualiti Alam Sekeliling (Pepejal Terampai) 2011
2. Kertas EQC Bil.2/108/2011
   Kertas oleh Pengerusi Jawatankuasa Kecil EQC, Prof. Dr. Nik Meriam bt. Nik Sulaiman
   - Kertas Perbincangan:
     Pelaksanaan Dasar Alam Sekitar Negara
3. Taklimat oleh En Mohamad Sanusi Sulaiman
   - Program Rakan Alam Sekitar (RAS) 2011

The Environmental Quality Council (EQC) had the 108th meeting on 21 March 2011.

The meeting was held in the Cempaka Meeting Room, 3rd Floor, Department of Environment's office, Putrajaya and was chaired by Y.Bhg. Prof. Dato' Ir. Dr. Zaini Bin Ujang, Vice Chancellor, University Technology Malaysia.

In April 2011, Y.Bhg. Datuk Suzannah Liaw representing the Sabah State Government was transfered to Sabah Youth and Sports Ministry and was replaced by Y.Bhg. Datuk Michael Emban, Mr. Abdul Aziz Bin Long replacing Mr. Peter Ho representing the registered Societies knowledgeable and having interests in matters pertaining to the environment, while Mr. K.N Gobinathan was appointed as the Alternate Member replacing Mr. Mohamad Dit representing Federation of Malaysian Manufacturers (FMM).

The council placed on record its appreciation to Y.Bhg. Datuk Suzannah Liaw, Mr. Peter Ho and Mr. Mohamad Dit for their contributions to EQC and welcomed the new members to the council.

The council had deliberated and endorsed matters presented at the meeting. Among the papers were as followed:-

EQC discussions at the 108th Meeting
(Date: 21 March 2011)

1. EQC Paper No. 1/108/2011
   Paper by Department of Environment
   - Discussion Paper:
     Proposed Environmental Regulations (Suspended Solids) 2011
2. EQC Paper No. 2/108/2011
   Paper by Chairman of EQC Sub Committee, Prof. Dr. Nik Meriam bt. Nik Sulaiman
   - Discussion Paper:
     Implementation of National Environmental Policy
3. Information Paper by Mr. Mohamad Sanusi Sulaiman
   - Rakan Alam Sekitar (RAS) 2011 Program

Jadual 1.1 JAS: Majlis Kualiti Alam Sekeliling 2011
Table 1.1 DOE: Environmental Quality Council 2011

Bil. / No.	Perwakilan / Representative	Nama / Name
1	Pengerusi EQC EQC Chairman	Y.Bhg. Prof. Dato' Ir. Dr. Zaini Bin Ujang
2	Ketua Setiausaha Kementerian Sumber Asli dan Alam Sekitar Secretary-General, Ministry of Natural Resources and the Environment	Y.Bhg. Datuk Zoal Azha Yusof
3	Wakil Ketua Setiausaha Kementerian Perdagangan Antarabangsa dan Industri Secretary-General, Ministry of Trade and Industry or his authorized representative	Tuan Haji Amran Sameon
4	Wakil Ketua Setiausaha Kementerian Perdagangan Dalam Negeri, Koperasi dan Kepenggunaan Secretary-General, Ministry of Domestic Trade Co-operatives and Consumerism or his authorized representative	Puan Siti Hajar Ibrahim
5	Wakil Ketua Setiausaha Kementerian Pertanian dan Industri Asas Tani Secretary-General, Ministry of Agriculture and Agro-Base Industries or his authorized representative	Encik Muhammad Salimi Bin Sajari
6	Wakil Ketua Setiausaha Kementerian Sumber Manusia Secretary-General, Ministry of Human Resources or his authorized representative	Tuan Haji Mohamad Bin Jamil
7	Wakil Ketua Setiausaha Kementerian Pengangkutan Secretary-General, Ministry of Transport or his authorized representative	Puan Saripah Abd. Mutalib
8	Wakil Pengarah Kementerian Kesihatan Malaysia Director General, Ministry of Health or his authorized representative	Y.M. Engku Azman B. Tuan Mat
9	Wakil Kerajaan Negeri Sabah Representative from the Sabah Government Ahli Giliran / Alternate Member	Y.Bhg Datuk Suzannah Liaw / Y.Bhg Datuk Michael Emban Encik Yabi Yangkat
10	Wakil Kerajaan Negeri Sarawak Representative from the Sarawak Government Ahli Giliran / Alternate Member	Datu Wan Alwi Bin Dato' Seri Wan Hashim Encik Peter Sawal
11	Wakil Industri Petroleum Representative from the Petroleum Industry Ahli Giliran / Alternate Member	Encik Mohd Tarmizi Munir Cik Maureen Song Chai Kee
12	Wakil Industri Kelapa Sawit Representative from the Oil Palm Industry Ahli Giliran / Alternate Member	Encik Teo Leng Dr. K. Ramadasan
13	Wakil Persekutuan Pekilang-Pekilang Malaysia Representative from the Federation of Malaysian Manufacturers Ahli Giliran / Alternate Member	Y. Bhg. Tan Sri Datuk Clifford Francis Herbert Encik Mohamad Dit / Encik K.N Gobinathan

Jadual 1.1 JAS: Majlis Kualiti Alam Sekeliling, 2011 (sambungan)
Table 1.1 DOE: Environmental Quality Council, 2011 (continued)

Bil. / No.	Perwakilan / Representative	Nama / Name
14	Wakil Industri Getah Representative from the Rubber Industry Ahli Giliran / Alternate Member	Encik Lim Sum Teck Encik Chin Hon Meng
15	Wakil Kakitangan Akademik Representative from the Academic Staff of the Universities or Colleges in Malaysia Ahli Giliran / Alternate Member	Prof. Dr. Nik Meriam Bte Nik Sulaiman Ir. Dr. Abdul Aziz Abd. Raman
16	Wakil Pertubuhan Yang Berpengalaman Mengenai Alam Sekitar Representative from the registered Societies knowledgeable and having interests in matters pertaining to the environment Ahli Giliran / Alternate Member	Encik Peter Ho / Encik Abdul Aziz Bin Long Ms Geetha P. Kumaran
17	Wakil Pertubuhan Yang Berpengalaman Berhubung Alam Sekitar (Kekosongan) Representative from the registered Societies knowledgeable and having interests in matters pertaining to the environment Ahli Giliran / Alternate Member	–

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 pengurusan kewangan. Bahagian ini juga memberi khidmat sokongan kepada semua kakitangan di Ibu Pejabat dan JAS Negeri. Bahagian ini dibahagikan kepada lima (5) seksyen yang utama iaitu Seksyen Pentadbiran, Seksyen Sumber Manusia, Seksyen Kewangan, Seksyen Pembangunan dan Latihan serta Seksyen Pengurusan Aset.

Pentadbiran Am

Pada 2011, Seksyen Pentadbiran telah menjalankan aktiviti-aktiviti seperti berikut:

- Perhimpunan Bulanan bersama Ketua Pengarah dan kakitangan JAS;
- Aktiviti-aktiviti ke arah pensijilan 5S di Ibu Pejabat JAS;
- Ceramah Kesihatan oleh Jabatan Keselamatan & Kesihatan Pekerjaan pada 5 Julai 2011;
- Majlis Jamuan Sambutan Hari Raya Aidilfitri 2011 pada 21 September 2011;
- Hari Inovasi JAS pada 7 Oktober 2011;
- Pertandingan Penjimatan Tenaga dan Sumber Pejabat Peringkat Kementerian Sumber Asli dan Alam Sekitar pada 15 Oktober 2011–14 November 2011;
- Hari Bersama Pelanggan pada 8 Disember 2011; dan
- Kempen Derma Darah pada 20 Disember 2011 oleh Pusat Darah Negara.

Kewangan

Pada tahun 2011, jumlah peruntukan yang diterima oleh JAS adalah sebanyak RM131,295,200.00. Daripada jumlah tersebut, sebanyak RM112,070,200.00 (85.35%) telah diperuntukkan bagi perbelanjaan mengurus sementara baki sebanyak RM19,225,000.00 (14.64%) merupakan peruntukan bagi perbelanjaan pembangunan. Prestasi perbelanjaan mengurus dan pembangunan bagi tahun 2011 masing-masing pada tahap 99.31% dan 99.32% (**Rajah 2.1** dan **Rajah 2.2**)

The Administration and Finance Division is responsible for planning, executing and monitoring general administrative activities, human resource and finance management. This division also provides support services to the different divisions of the Headquarters as well as all the State DOE offices nationwide. This division is divided into five (5) main sections, namely the Administrative Section, Human Resource Section, Finance Section, Development and Training Section and the Assets Management Section.

General Administration

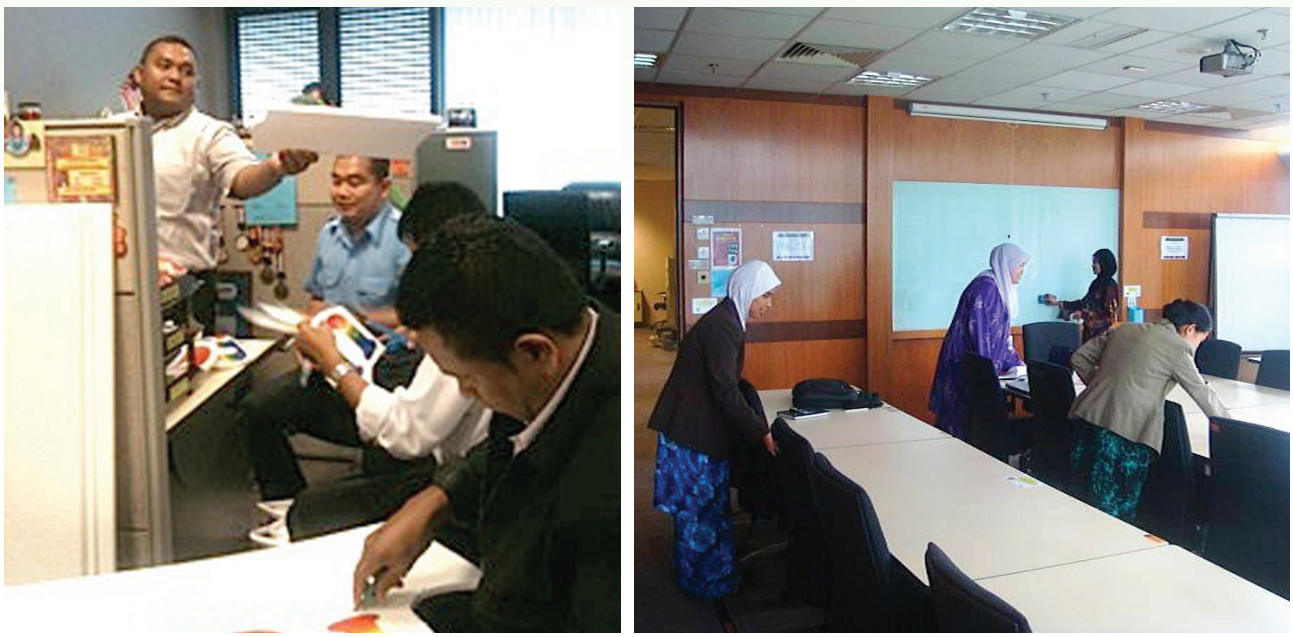
In 2011, the Administrative Section conducted the following activities:

- Monthly Assembly with the Director General and staff of DOE;
- Various activities leading to the 5S certification by MPC;
- Talk on Health by Department of Safety & Health on 5 July 2011;
- Hari Raya Aidilfitri celebration luncheon on 21 September 2011;
- Innovation Day on 7 October 2011;
- Competition on Energy and Cost Saving at Ministrial level involving all Divisions and Agencies under the Ministry of Natural Resources and Environment from 15 October 2011 – 14 November 2011;
- Meet The Client's Day 2011, on 8 December 2011; and
- Blood Donation Campaign in collaboration with National Blood Bank on 20 December 2011.

Finance

In 2011, DOE received a total budget allocation of RM131,295,200.00. Of this amount, a sum of RM112,070,200.00 (85.35%) was allocated for operational expenditure while the remaining RM19,225,000.00 (14.64%) was allocated for development projects. Expenditure performances for the operational and development budgets were 99.31% and 99.32% respectively (**Figure 2.1** and **Figure 2.2**).

Ahli-ahli Jawatankuasa 5S Ibu Pejabat JAS yang memenangi Pertandingan Mini Konvensyen 5S sempena Hari Inovasi Peringkat Kementerian
DOE Headquarter 5S Committee who won the 5S Mini Convention Competition in conjunction of Innovation Day



Aktiviti Gotong-Royong 5S Yang dijalankan di Ibu Pejabat JAS
5S Cleaning Up Activities Carried Out in the DOE Headquarters

Pengurusan Sumber Manusia

Pada tahun 2011, Jabatan Alam Sekitar telah meneruskan pengambilan kakitangan baru untuk mengisi jawatan sedia ada dan bagi keperluan masa depan. Sehingga 31 Disember 2011, keseluruhan perjawatan JAS adalah sebanyak 1,607 jawatan. Daripada jumlah perjawatan tersebut, 21.97% adalah anggota Kumpulan Pengurusan dan Profesional dan 78.22% adalah anggota Kumpulan Sokongan (**Rajah 2.3, 2.4** dan **2.5**).

Selain itu, urusan kenaikan pangkat telah dilaksanakan pada tahun 2011 untuk jawatan berikut:-

i. 1 jawatan Gred JUSA A
ii. 1 jawatan Gred JUSA B
iii. 7 jawatan Gred C52
iv. 1 jawatan Gred C48
v. 26 jawatan Gred C44
vi. 2 jawatan Gred M44
vii. 7 jawatan Gred C38
viii. 6 jawatan Gred C32
ix. 5 jawatan Gred N27
x. 2 jawatan Gred J26
xi. 16 jawatan Gred J22
xii. 4 jawatan Gred N22
xiii. 5 jawatan Gred N4
xiv. 3 jawatan Gred R6
xv. 2 jawatan Gred R4

Latihan dan Kompetensi

Pegawai dan kakitangan yang baru dilantik telah diberikan latihan asas yang berkaitan untuk memastikan sistem penyampaian Jabatan dapat dipertingkatkan. Selaras dengan konsep pembelajaran berterusan, semua warga kerja jabatan digalakkan untuk menjalani pelbagai kursus yang dianjurkan oleh JAS dan agensi-agensi berkaitan. Bagi tahun 2011, 96.60% daripada keseluruhan bilangan anggota JAS telah menjalani kursus melebihi 7 hari dengan jayanya.

Bagi tahun 2011, peperiksaan PTK dimansuhkan setelah diperkenalkan pada tahun 2002. Peperiksaan ini akan digantikan dengan Program Bersepadu Potensi dan Kompetensi (PROSPEK).

Human Resource Management

In 2011, the Department of Environment continued to recruit new staff to fulfill its present and future needs. As of 31 December 2011, the total strength of DOE was 1,607 of which 21.97% were from the Professional and Management Group and 78.22% from the Support Group (**Figures 2.3, 2.4** and **2.5**).

In addition to that, the promotion exercise was done in 2011 for the following positions:-

i. 1 position of Grade JUSA A
ii. 1 position of Grade JUSA B
iii. 7 positions of Grade C52
iv. 1 position of Grade C48
v. 26 positions of Grade C44
vi. 2 positions of Grade M44
vii. 7 positions of Grade C38
viii. 6 positions of Grade C32
ix. 5 positions of Grade N27
x. 2 positions of Grade J26
xi. 16 positions of Grade J22
xii. 4 positions of Grade N22
xiii. 5 positions of Grade N4
xiv. 3 positions of Grade R6
xv. 2 positions of Grade R4

Training and Competency

New officers and staff recruited were provided with relevant basic training to ensure the delivery system of the Department would be further enhanced. In line with the concept of continuous learning, all staff were encouraged to participate in various courses organized by DOE and relevant agencies. In 2011, 96.60% of the Department's total workforce had successfully undergone more than 7 days of training.

In 2011, the Competency Level Assessment Examinations (PTK) was abolished after it was introduced in 2002. This exam will be replaced by Program Bersepadu Potensi dan Kompetensi (PROSPEK).

Di samping itu, Peperiksaan Pengesahan Dalam Jawatan kepada pegawai-pegawai Gred C41, C27 dan J17 telah diadakan sebanyak 2 kali (Jun dan Disember). Peperiksaan Kenaikan Pangkat Secara Lantikan (KPSL) Gred C41 telah diadakan pada bulan Julai 2011 yang bertujuan untuk meningkatkan kerjaya pegawai-pegawai teknikal di JAS.

Two (2) Service Confirmation Examinations for officers of Grades C41, C27 and J17 were held (June and December). The Promotion Examinations (KPSL) Grade C41 were held in July 2011 to allow technical officers in DOE to further enhance their career development.

Penghargaan Terhadap Warga Kerja Cemerlang

Majlis Anugerah Perkhidmatan Cemerlang Tahun 2010 telah diadakan pada 28 Mac 2011. Seramai 124 orang pegawai telah dipilih untuk menerima anugerah ini sebagai tanda penghargaan jabatan terhadap prestasi kerja yang cemerlang pegawai-pegawai ini sepanjang tahun 2010.

Appreciation of Excellent Employees

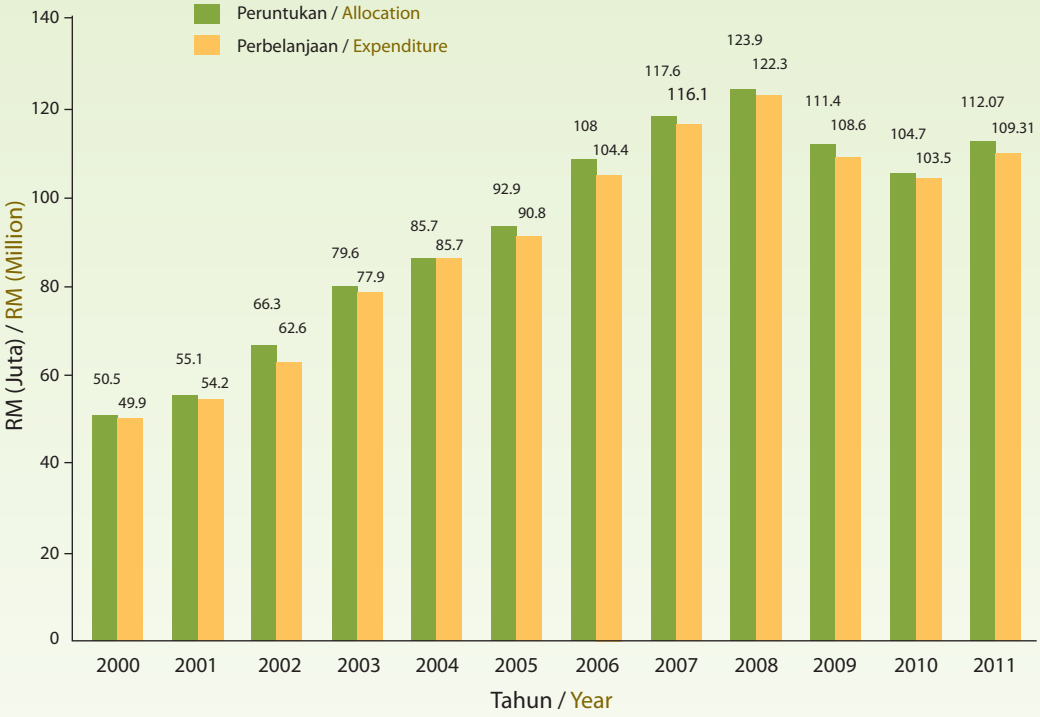
The 2010 Excellent Service Awards Presentation Ceremony was held on 28 March 2011. A total of 124 officers received this award in recognition of their excellent job performance throughout 2010.

Pengurusan Aset dan Stor

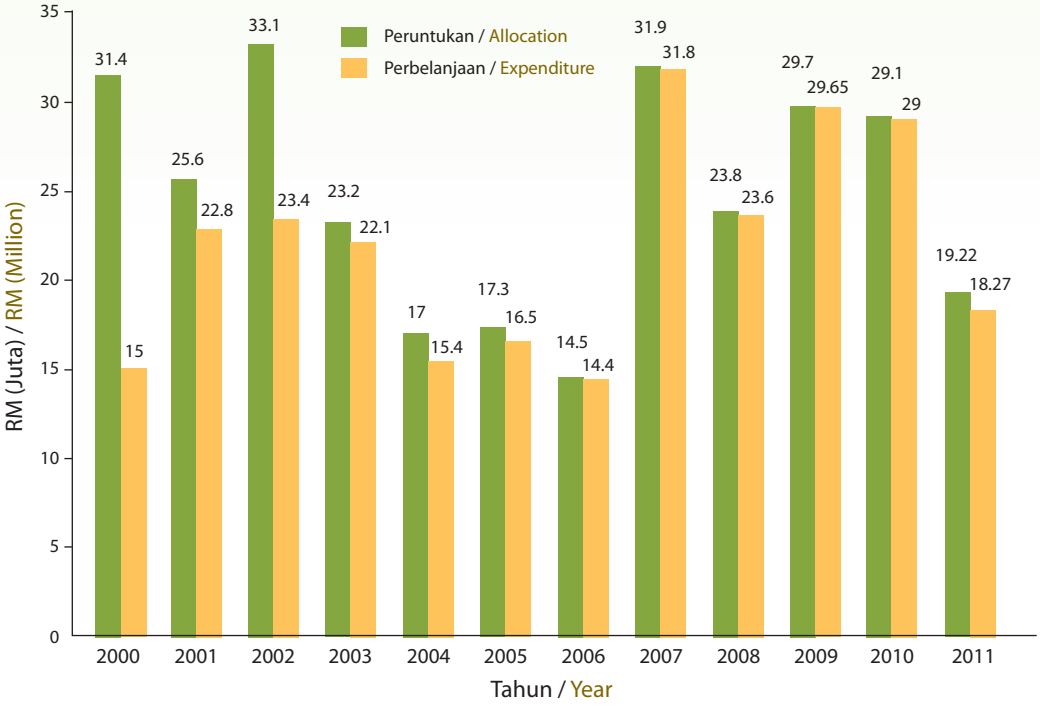
Seksyen Pengurusan Aset, Stor dan Peralatan telah ditubuhkan di Ibu Pejabat Jabatan Alam Sekitar pada Januari 2010. Fungsi utama Seksyen ini adalah bagi menyelaras pengurusan aset dan stor bagi seluruh Jabatan Alam Sekitar Malaysia berdasarkan Pekeliling Perbendaharaan Bilangan 5 Tahun 2007 (Tatacara Pengurusan Aset) dan Pekeliling Perbendaharaan Bil 5 Tahun 2009 (Tatacara Pengurusan Stor).

Assets and Store Management

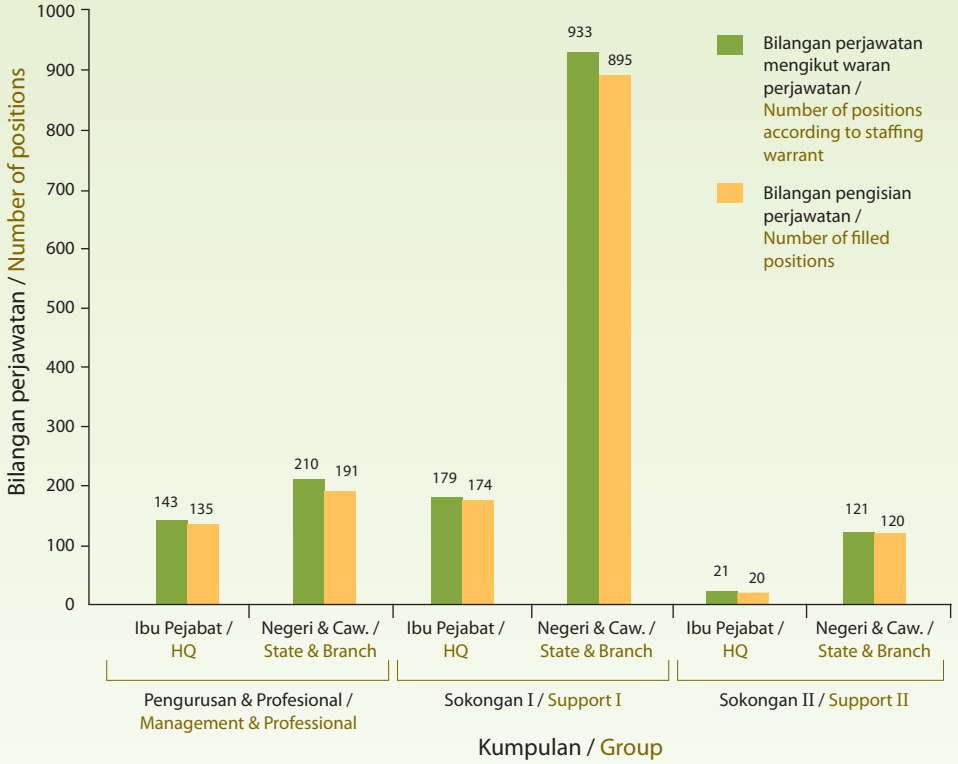
The Assets, Store and Instruments Section was set up in the Department of Environment Headquarters on January 2010. Its main function is to coordinate the management of assets and store for the department nationwide, in accordance to the Treasury Circular No.5 2007 (Assets Management Procedure) and the Treasury Circular No.5 2009 (Store Management Procedure).



Rajah 2.1 JAS: Peruntukan dan Perbelanjaan (Mengurus), 2000-2011
Figure 2.1 DOE: Allocation and Expenditure (Operational), 2000-2011

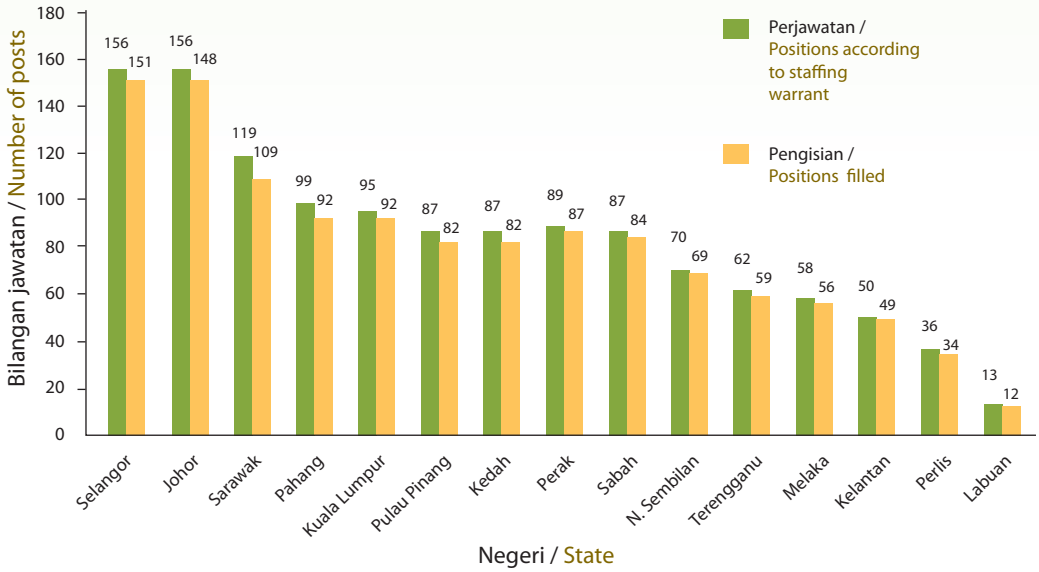


Rajah 2.2 JAS: Peruntukan dan Perbelanjaan (Pembangunan), 2000-2011
Figure 2.2 DOE: Allocation and Expenditure (Development), 2000-2011



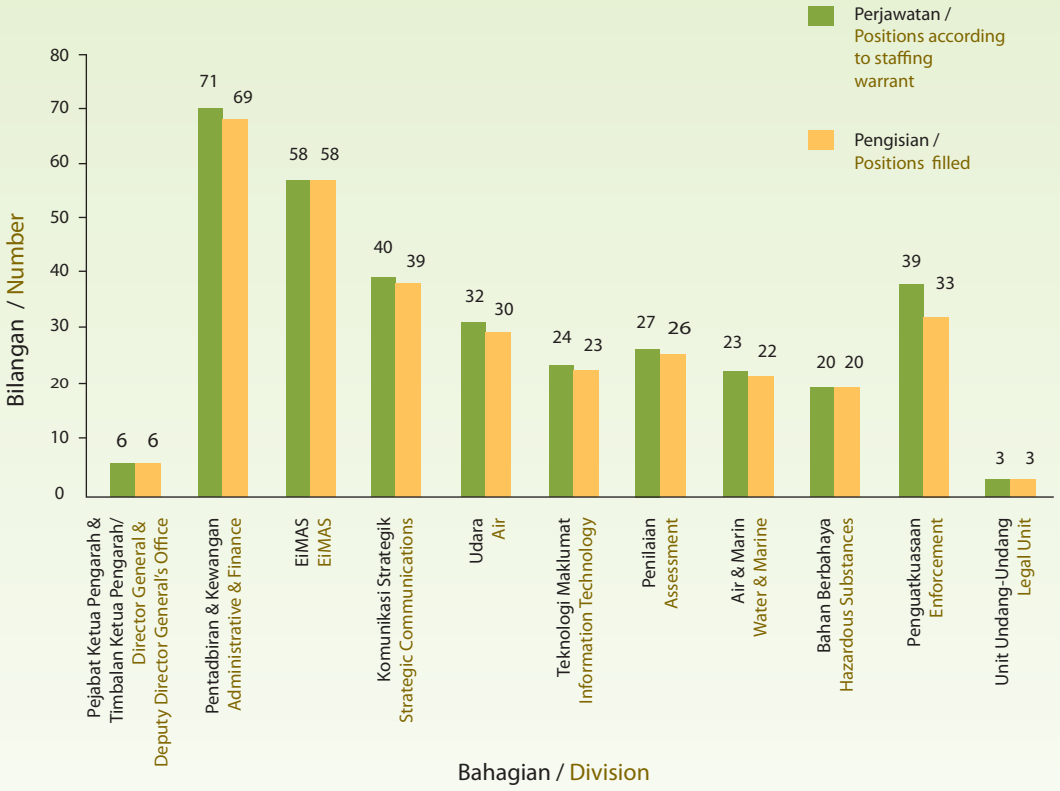
Rajah 2.3 JAS: Perbandingan Antara Bilangan Perjawatan Dalam Waran Perjawatan dan Bilangan Pengisian Mengikut Kumpulan (JAS Ibu Pejabat dan Negeri), 2011

Figure 2.3 DOE: Comparison between the Number of Positions Stipulated in Staffing Warrant and the Number of Positions Filled (Headquarters and State Offices) According to Group, 2011



Rajah 2.4 JAS: Perbandingan Perjawatan (Mengikut Waran Perjawatan) dan Pengisian Jawatan Mengikut Negeri, 2011

Figure 2.4 DOE: Comparison between the Number of Positions (Stipulated in Staffing Warrant) and the Number of Filled Positions by State, 2011



Rajah 2.5 JAS: Perbandingan Perjawatan (Mengikut Waran Perjawatan) dan Pengisian Jawatan Mengikut Bahagian di Ibu Pejabat JAS, 2011

Figure 2.5 DOE: Comparison between the Number of Positions (Stipulated in Staffing Warrant) and the Number of Filled Positions by Division in DOE Headquarters, 2011

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 masalah-masalah alam sekitar akibat aktiviti pembangunan. Ianya juga dapat menghindarkan perbelanjaan yang tinggi dalam pelaksanaan projek yang disebabkan oleh kerosakan alam sekitar semasa pelaksanaan projek.

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.

Laporan EIA 2011

Sebanyak 273 laporan telah diterima pada tahun 2011 (**Rajah 3.1**). Daripada bilangan ini, 248 laporan EIA telah diproses mengikut prosedur Penilaian Awal EIA dan 25 laporan EIA lagi melalui Prosedur Terperinci (**Rajah 3.2**). Negeri Johor menerima bilangan laporan EIA tertinggi pada tahun 2011 diikuti dengan Negeri Selangor (**Rajah 3.3** dan **Rajah 3.4**).

Prosedur EIA: Piagam Pelanggan

Selaras dengan usaha Kerajaan dalam mempertingkatkan perkhidmatan sektor awam, Jabatan Alam Sekitar (JAS) telah mengambil langkah bagi mempertingkatkan serta memperkukuhkan sistem penyampaian Jabatan, khususnya di dalam prosedur dan pemprosesan EIA. Sehubungan itu, piagam pelanggan bagi memproses Laporan EIA Awal telah dipercepatkan dari 12 minggu kepada 5 minggu, dan piagam pelanggan bagi Laporan EIA Terperinci telah ditambahbaik dari 20 minggu kepada 12 minggu. Usaha ini dilihat dapat membantu di dalam melancarkan pelaksanaan projek-projek pembangunan khususnya projek-projek Kerajaan dan juga projek-projek yang telah digariskan di dalam pelan-pelan pembangunan.

Environmental Impact Assessment (EIA) is essentially a planning tool for preventing and reducing the environmental impact due to development activity. It also seeks to avoid costly mistakes in the project implementation.

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

EIA Reports 2011

A total of 273 reports were received in 2011 (**Figure 3.1**). Of these, 248 were Preliminary EIA reports and 25 Detailed EIA reports (**Figure 3.2**). Johor received the highest number of EIA reports in 2011, followed by Selangor (**Figure 3.3** and **Figure 3.4**).

EIA Procedures: Client Charter

Consistent with the Government's effort in improving the public delivery system, the Department of Environment (DOE) has taken the step to enhance as well as to strengthen the Department's delivery system, in particular the EIA procedures and processes. In this regard, the time taken to process a preliminary EIA report has been reduced from 12 weeks to 5 weeks, and from 20 weeks to 12 weeks for a detailed EIA. This effort has been recognized as one of the catalysts in ensuring that government-related development projects as well as other development projects as outlined in the development plans, progress smoothly.

Beberapa langkah berterusan diambil di dalam memastikan prosedur dan pemprosesan EIA yang ditambahbaik berjalan dengan lancar, seperti berikut:-

(i) Memperkenalkan Skim Pendaftaran Jururunding bagi mempertingkatkan tahap profesionalisma pengamal-pengamal EIA dengan memastikan mereka mempunyai kelayakan dan kemahiran bagi melaksanakan kajian EIA. Semua jururunding EIA hendaklah berdaftar dengan JAS di bawah skim ini supaya laporan EIA yang berkualiti disediakan.

(ii) Menyediakan beberapa dokumen panduan (*guidance document*) dalam bentuk *"scope of work"* dan *"checklist"* bagi membantu jururunding menyediakan laporan EIA yang lengkap, berkualiti serta menjurus kepada isu-isu utama dan signifikan bagi sesuatu projek, yang boleh dirujuk melalui laman web JAS. Laporan EIA yang tidak memenuhi skop ini (tidak lengkap) akan terus ditolak.

(iii) Melengkapkan pengetahuan pegawai-pegawai yang memproses laporan EIA dari masa ke semasa dengan kursus-kursus teknikal yang ditawarkan serta pengalaman semasa di lapangan dan semasa pemprosesan laporan EIA.

Pakej Penambahbaikan EIA-ESC

Pada tahun 2011, Jabatan Alam Sekitar telah membuat penambahbaikan kepada aspek kawalan hakisan tanah dan sedimen dalam prosedur kajian kesan kepada alam sekeliling (EIA) dan proses-proses selanjutnya seperti Pelan Pengurusan Alam Sekitar (EMP), syarat-syarat kelulusan EIA dan senarai semak pemeriksaan langkah-langkah kawalan hakisan dan sedimen di tapak. Dalam pakej penambaikan ini, dokumen-dokumen berikut telah disediakan dan digunapakai mulai tahun 2011:

i. *Guidance Document for the Preparation and Submission of Environmental Management Plans(EMPs);*

ii. *Guidance Document for the Preparation of Erosion and Sediment Control Plans (ESCPs);* dan

iii. Syarat-Syarat Kelulusan EIA Berkaitan Kawalan Hakisan Tanah dan Sedimen.

Continuous measures have been taken, to assure that the improved EIA procedures and decision-making processes proceed efficiently, among others:-

(i) Introducing an EIA Consultant Registration Scheme to improve the standard of professionalism among EIA practitioners by ensuring that they have qualifications and skills required to conduct an EIA study. All EIA Consultants must be registered with the DOE under this scheme to guarantee good quality EIA reports being submitted.

(ii) Developing several guidance documents in the form of checklists and scope of work, essentially to assist project proponents and EIA consultants in submitting a complete and good quality EIA report which focus on critical and significant issues of the proposed project. These guidance documents are made available in the DOE's website. Incomplete EIA reports will be rejected instantaneously by the DOE.

(iii) Enriching and expanding the technical knowledge of EIA processing officers, from time to time through various technical courses and on-the job experiences via site investigations and quality assessment of the EIA reports.

EIA-ESC Improvement Package

In 2011, the Department of Environment enhanced the study of soil erosion and sediment control aspect in the environmental impact assessment (EIA) procedures and subsequent processes such as Environmental Management Plan (EMP), the conditions of approval and a list of relevant EIA inspection checklist of erosion and sediment control measures on site. In this improvement package, the following documents have been prepared and adopted in 2011:

i. Guidance Document for the Preparation and Submission of Environmental Management Plans(EMPs);

ii. Guidance Document for the Preparation of Erosion and Sediment Control Plans (ESCPs); and

iii. EIA Approval Conditions Relating to Soil Erosion and Sediment Control.

Siasatan Penguatkuasaan Projek EIA

Sejumlah 1,414 siasatan penguatkuasaan telah dijalankan pada tahun 2011 untuk mengenalpasti status pembangunan dan pematuhan projek-projek EIA (**Rajah 3.5**). Daripada siasatan-siasatan tersebut sebanyak 867 notis atau surat arahan dan 53 kompaun telah dikeluarkan manakala 28 kes telah didakwa di mahkamah kerana tidak mematuhi syarat-syarat kelulusan.

EIA Enforcement Investigations

A total of 1,414 enforcement investigations were conducted in 2011 to determine the compliance of EIA approval conditions (**Figure 3.5**). From the investigations, a total of 867 notices or written directives and 53 compounds were served and 28 cases were charged in court for non-compliance.

Input Alam Sekitar Kepada Perancangan Pembangunan

Pada tahun 2011, sejumlah 100 input alam sekitar telah dikemukakan kepada agensi-agensi yang berkaitan. Kebanyakan input-input ini adalah mengenai Penyelarasan Perancangan Pembangunan, Pelan Tempatan, Kajian Rancangan Fizikal Negara, Kajian Kawasan Sensitif Alam Sekitar dan aktiviti-aktiviti Pembangunan di Tanah Tinggi.

Environmental Input For Development Planning

In 2011, a total of 100 environmental inputs were provided to other agencies in relation to development planning coordination, local plans, review of national physical plans, environmentally sensitive areas and highland development activities.

Skim Pendaftaran Jururunding EIA

Skim Pendaftaran Jururunding EIA yang baru telah mula diperkenalkan pada 1 Jun 2007. Mulai 1 Oktober 2007 pula, Jabatan Alam Sekitar telah mula mewajibkan semua jururunding EIA untuk berdaftar dengan JAS sebelum dibenarkan menjalankan kajian.

Bagi tahun 2011, Mesyuarat Panel Penilaian Permohonan Jururunding telah diadakan sebanyak tiga kali. Sebanyak 91 permohonan telah diterima dan hanya 16 daripadanya telah didaftarkan sebagai Jururunding EIA, 15 sebagai Jururunding Subjek dan 29 Penolong Jururunding (**Jadual 3.1**). Sehingga 31 Disember 2011, 981 individu telah didaftarkan dengan JAS untuk menjalankan kajian EIA, dimana 249 orang adalah Jururunding EIA, manakala selebihnya merupakan Jururunding Subjek iaitu seramai 342 orang dan Penolong Jururunding seramai 390 orang (**Jadual 3.2**).

Proses pembaharuan pendaftaran bagi Jururunding EIA telah dijalankan sebanyak empat kali, berikutan tempoh pendaftaran mereka selama 3 tahun telah pun tamat. Sehingga 31 Disember 2011, seramai 229 individu telah berdaftar dengan JAS sebagai Jururunding EIA perlu memperbaharui pendaftaran mereka. Walau bagaimanapun hanya 184 individu sahaja yang telah memperbaharui pendaftaran mereka.

EIA Consultants Registration

The new EIA Consultant Registration Scheme was introduced on 1 June 2007. Starting from 1 October 2007, the Department of Environment has made it a requirement for consultants to be registered before they are allowed to conduct the study.

In 2011, three (3) Consultant's Application Assessment Panel Meetings had been carried out. A total of 91 applications were reviewed and only 16 had been registered as EIA Consultants, 15 as Subject Consultants and 29 as Assistant Consultants (**Table 3.1**). Until 31 December 2011, a total of 981 individuals had been registered with DOE to conduct EIA studies. A total of 249 are EIA Consultant, 342 are Subject Consultants and 390 are Assistant Consultants. (**Table 3.2**).

In addition, the renewal of registered EIA Consultants after 3 years of registration was carried out four (4) times in 2011. As of 31 December 2011, 229 registered EIA Consultants were required to renew their registration. However, only 184 individuals applied for renewal.

Tujuan utama skim pendaftaran ini adalah untuk memastikan hanya individu yang benar-benar kompeten sahaja dibenarkan menjalankan kajian EIA. Ini memastikan kualiti laporan EIA adalah baik dan membantu pembuat keputusan membuat keputusan yang terbaik terhadap sesuatu cadangan projek.

The main objective of the scheme is to ensure only competent individuals are allowed to conduct EIA study. This is to ensure the quality of EIA reports which will later assist the decision makers in making the best decision on the proposed project.

AKTIVITI-AKTIVITI DAN LAIN-LAIN OUTPUT

Kursus Induksi Untuk Jururunding EIA

Bermula Januari 2010, setiap pemohon yang ingin berdaftar sebagai Jururunding EIA dan memperbaharui pendaftaran, perlu menghadiri kursus *EIA Induction Course for EIA Consultant* dan lulus penilaian sebelum didaftarkan mengikut kategori masing-masing. Pada tahun 2011 sejumlah empat (4) kursus telah dilaksanakan dengan jumlah peserta seramai 155. Walau bagaimanapun hanya 143 peserta sahaja yang telah lulus penilaian dengan jayanya (**Jadual 3.3**).

Tujuan utama kursus ini dilaksanakan adalah untuk memberikan bimbingan dalam penyediaan Laporan EIA bagi memenuhi kehendak dan keperluan JAS serta pihak-pihak yang berkepentingan. Ia juga untuk memberikan penerangan dalam penyediaan EIA bagi membantu perancangan projek. Modul kursus ini dibangunkan kerana JAS mendapati masih terdapat beberapa kelemahan dalam kajian EIA khususnya skop kajian serta kaedah pelaporan.

Skim Pendaftaran Juruaudit Alam Sekitar

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

Bagi tahun 2011, sebanyak sembilan (9) permohonan telah diterima dan enam (6) daripadanya telah didaftarkan sebagai Juruaudit Alam Sekitar (**Jadual 3.4**). Sehingga 31 Disember 2011, sebanyak 52 orang individu telah didaftarkan sebagai Juruaudit Alam Sekitar. (**Jadual 3.5**)

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

OTHER ACTIVITIES AND OUTPUTS

Induction Course For EIA Consultants

Starting from January 2010, all registered consultants were required to attend and pass the compulsory EIA Induction Course as a prerequisite for the renewal of their registration. New applicants were also required to attend the induction course prior to submission of their application to DOE. A total of four (4) courses had been conducted with a total of 155 participants. However, only 143 participants successfully passed the assessment (**Table 3.3**).

The main objective of the course is to provide detailed explanation to all consultants involved in EIA study on the relevant administrative and technical requirements, as well as other critical issues to be considered in EIA study. It also provides information for preparing the EIA reports that help in project planning. The modules were developed by DOE to strengthen the preparation of EIA studies particularly in the scoping and reporting method.

Environmental Audit Registration

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

In 2011, a total of nine (9) applications were received; and six (6) auditors were successfully registered as Environmental Auditors (**Table 3.4**). Until 31 December 2011, a total of 52 auditors had been registered under the Scheme (**Table 3.5**).

The main objective of the scheme is to ensure that only competent individuals are allowed to conduct the third party environmental audit in accordance with Section 33A of the Environmental Quality Act 1974. This

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

Kursus Induksi Untuk Juruaudit Alam Sekitar

Pada tahun 2011, pelaksanaan kursus induksi untuk Juruaudit Alam Sekitar yang berdaftar pada tahun 2010 dan 2011 telah mula dijalankan. Kehadiran ke kursus ini juga diwajibkan bagi semua juruaudit berdaftar. 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.

Forum Tahunan Juruaudit Alam Sekitar

JAS telah mengadakan sesi Forum Tahunan untuk Juruaudit Alam Sekitar yang berdaftar bagi membincangkan isu-isu yang dihadapi oleh Juruaudit Alam Sekitar dalam pelaksanaan audit pematuhan seperti yang dikehendaki oleh JAS. Forum ini telah berlangsung pada 6 Oktober 2011 di Pusat Konvensyen Antarabangsa Putrajaya (PICC) dan dihadiri oleh Juruaudit Alam Sekitar dan pegawai-pegawai JAS Negeri. Forum ini memberi fokus kepada isu keperluan audit pematuhan bagi langkah kawalan hakisan dan sedimen (BMPs) di tapak projek dan semasa fasa kerja tanah.

Pembangunan Profesional Berterusan

Keperluan bagi Pembangunan Profesional Berterusan telah diwajibkan di bawah Skim Pendaftaran Juruaudit Alam Sekitar, di mana juruaudit berdaftar perlu mengumpul jumlah jam latihan yang tertentu bagi

scheme will ensure the implementation of environmental audit and reporting follows the procedures and guidelines. The implementation of the environmental audit will help to reduce enforcement activity and encourage the industry and project proponent to increase their environmental compliance directly and indirectly.

Induction Course for Environmental Auditors

In 2011, all registered environmental auditors were required to attend the compulsory induction course as a prerequisite for the renewal of their registration. The objectives of the course are to guide the Registered Environmental Auditor to undertake environmental audit in a manner that meets 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.

Environmental Auditor Yearly Forum

DOE has conducted the Annual Forum Session for the registered Environmental Auditors to discuss issues faced by auditors in the implementation of environmental compliance audits as required by the DOE. This forum was held on 6 October 2011 at the Putrajaya International Convention Centre (PICC) and attended by Environmental Auditors and DOE State officers. This forum focused on compliance audit requirements for erosion and sediment control measures (BMPS) at the project site and during the earthworks phase.

Continuous Professional Development (CPD)

The requirement for Continuous Professional Development has been included under the Environmental Auditor Registration Scheme. Therefore, registered auditors are required to obtain a certain

membolehkan mereka memperbaharui pendaftaran. Mana-mana penyedia latihan boleh memohon bagi mendapatkan jam kredit. Maklumat berkenaan program-program ini kemudiannya disebarkan kepada semua juruaudit berdaftar.

number of training (CPD) hours every year to enable them to renew their registration. Course organizer or course provider may apply to obtain CPD hours for their programmes. The information about the programmes were disseminated to all registered auditors.

Penyediaan Garis Panduan EIA

Pada tahun 2011, JAS telah meneruskan usaha dalam penyediaan garis panduan EIA bagi menyediakan panduan penyediaan Laporan EIA. Tiga garis panduan sedang disediakan iaitu Garis panduan EIA Tapak Pelupusan Sanitari Sisa Pepejal, Garis panduan EIA Bagi Loji Penunuan (Insinerator) Sisa Pepejal serta Garis panduan bagi Penempatan dan Pengezonan Industri & Kawasan Perumahan.

Objektif garispanduan ini adalah untuk membantu jururunding EIA bagi menjalankan kajian penilaian kesan alam sekeliling bagi aktiviti pembangunan khususnya tapak pelupusan sanitari sisa pepejal dan insinerator manakala bagi Garis panduan Penempatan dan Pengezonan Industri dan Kawasan Perumahan adalah untuk membantu pembuat keputusan dalam menentukan tapak dan pembangunan kawasan perindustrian dan kediaman yang baru untuk meminimumkan impak terhadap alam sekitar.

Garispanduan ini dijangka siap sepenuhnya pada tahun 2012.

Penilaian Awal Tapak Projek

Bagi projek-projek pembangunan yang tidak tertakluk di bawah Perintah-Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan)(Penilaian Kesan Kepada Alam Sekeliling), 1987, pemaju perlu mengemukakan permohonan Penilaian Awal Tapak (PAT) untuk menentukan kesesuaian tapak projek yang dicadangkan.

Pada tahun 2011, sejumlah 14,906 permohonan telah diterima di mana Negeri Johor mencatat permohonan PAT (2,711) paling tinggi, diikuti oleh Pahang (2,613) dan lain-lain negeri seperti yang ditunjukkan di (**Rajah 3.6.**) Permohonan ini dirujukkan kepada JAS oleh Kerajaan Negeri, Pihak Berkuasa Tempatan dan Pejabat Tanah.

EIA Guidelines Preparation

In 2011, DOE has continued its efforts in the preparation of EIA guidelines to provide guidance on the preparation of EIA report. Three guidelines are being prepared namely EIA Guidelines for Solid Waste Sanitary Landfill, EIA Guidelines For Incineration Plant (Incinerator) and Guidelines for Siting and Zoning of Industries and Residential Area.

The objective of these guidelines is to assist EIA consultants to conduct environmental impact assessments for development activities, particularly sanitary landfills and solid waste incinerator while the Guidelines for Siting and Zoning of Industries and Residential Area is to assist decision makers in making well informed decision on the siting and development of new industrial and residential areas to minimize the potential environmental impacts.

These guidelines are expected to be completed in 2012.

Project Pre-Siting Evaluation

Where development projects were not subjected to the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987, pre-siting evaluation of proposed project sites were carried out.

In 2011, a total of 14,906 applications were received where Johor recorded the highest number of applications (2,711), followed by Pahang (2,613) and other states as shown in (**Figure 3.6.**) These applications were mainly referred to DOE by state Government, Local Authorities and Land Offices.

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

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

Pemberitahuan Dan Kelulusan Bertulis

Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan), 2009 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009 menghendaki supaya pemberitahuan bertulis diperolehi terlebih dahulu daripada Ketua Pengarah Alam Sekitar sebelum apa-apa sistem pengolahan kumbahan/efluen perindustrian dipasang. Manakala Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978 menghendaki supaya Kelulusan Bertulis diperolehi terlebih dahulu daripada Ketua Pengarah Alam Sekitar sebelum alat pembakaran bahan api dan cerobong dipasang.

Written Notification And Approval

The Environmental Quality (Sewage) Regulations 2009 and the Environmental Quality (Industrial Effluents) Regulations 2009 require written notifications to be submitted to the Director General of Environment before constructions of sewage/industrial effluent treatment system are installed. The Environmental Quality (Clean Air) Regulations, 1978 require Written Approval to be submitted to the Director General of Environment before fuel burning equipment and chimney/stack are installed.

Pada tahun 2011, JAS telah menerima 57 pemberitahuan bertulis bagi pembinaan loji rawatan sisa kumbahan (**Rajah 3.7A**), 277 pemberitahuan bertulis bagi punca baru atau yang diubah efluen perindustrian atau efluen bercampur (**Rajah 3.7B**) dan 2,107 permohonan bagi pemasangan alat kawalan pencemaran udara (**Rajah 3.8**). Selain daripada peralatan kawalan pencemaran, Jabatan Alam Sekitar juga telah menerima 2,530 permohonan bagi kelulusan bertulis untuk pemasangan alat pembakaran bahan api seperti dandang dan alat janakuasa (**Rajah 3.9**).

In 2011, 57 written notifications were received for construction of sewage treatment plants (**Figure 3.7A**), 277 written notifications for new or altered sources of discharge of industrial effluent or mixed effluents (**Figure 3.7B**) and 2,107 applications for installation of air pollution control equipment (**Figure 3.8**). In addition 2,530 applications for written approvals for installation of fuel burning equipment such as boilers and generator sets were processed (**Figure 3.9**).

Sistem Maklumat Geografi (GIS)

Pembangunan dan penggunaan teknologi GIS di JAS telah giat berkembang dalam tahun 2011. Bagi memastikan teknologi GIS ini terus dimanfaatkan, Kursus Asas GIS 1 dan 2 telah dilaksanakan dengan kerjasama EiMAS serta dua (2) siri bengkel telah diadakan bagi melatih pegawai-pegawai JAS Negeri bagi menjadi Pegawai Teras GIS untuk menjalankan sesi *Hands-On* GIS kepada semua pegawai JAS Negeri.

Geographical Information System (GIS)

The development and use of GIS technology in the DOE are extensively implemented in 2011 to train DOE officers. GIS Course 1 and 2 are implemented in collaboration with EiMAS and two (2) series of workshops were held to train State DOE officers to be GIS Core Officers and subsequently give hands on session to all DOE State officers.

Bagi program pembangunan data GIS, perolehan data imej satelit dan data bagi Program Rakan Alam Sekitar telah dilaksanakan untuk melengkapkan pangkalan data spatial. Selain daripada itu, perolehan peralatan dan perisian serta pembaharuan lesen perisian berkaitan GIS turut dilaksanakan.

For GIS data development program satellite image data and Partners of Environment Program data had been implemented to complement the spatial data center. In addition, the procurement of equipment and software and related GIS software licence renewal were also implemented.

Bagi memastikan perkembangan GIS ini dapat diselaraskan dan mencapai objektif, tiga (3) sesi mesyuarat telah diadakan iaitu Mesyuarat Penyelarasan GIS, Mesyuarat Penambahbaikan Penggunaan GIS dalam Prosedur Kerja dan Mesyuarat 'Think Tank' GIS JAS.

To ensure the development of GIS can achieve its objectives, three (3) meetings were held namely, the GIS Coordination Meeting, Meeting for Improving Use of GIS In Work Procedures and Think Tank GIS Meeting.

Aplikasi Portal GIS terus digunakan sebagai alat bantuan bagi kegunaan pembangunan, analisis dan pengurusan alam sekitar. Dalam hal ini program bagi melengkapkan dan mengemaskini punca-punca pencemaran, stesen-stesen pengawasan kualiti alam sekitar, projek-projek pembangunan dalam Sistem E-KAS turut dilaksanakan secara berterusan.

GIS Portal applications continue to be used as a tool for use in the development, analysis and environmental management. In this case the program to complement and update the source of contamination, environmental quality monitoring stations and development projects in E-KAS System were also implemented continouosly.

Dengan adanya teknologi GIS di JAS, maklumat harian seperti lokasi titik panas dapat disalurkan kepada pegawai JAS bagi tujuan pemantauan dan penguatkuasaan kawasan pembakaran terbuka. GIS juga digunapakai dalam membekalkan input yang berkaitan dengan maklumat spatial dan peta yang diperlukan oleh bahagian-bahagian di Ibu Pejabat, pejabat JAS Negeri / Cawangan dan lain-lain agensi.

With the availability of GIS technology in the DOE, daily information such as location of hot spots can be provided to DOE officers for the purpose of monitoring and enforcement of open burning. GIS applications had been applied to provide inputs relating to spatial information and maps required by various divisions in the Headquaters, State / Branch Offices and other agencies.

Persijilan MS ISO 9001: 2008

JAS telah memperolehi sijil MS ISO 9001:2008 pada 19 Mac 2010 bagi skop pemprosesan Laporan EIA dan penguatkuasaan syarat-syarat kelulusan berdasarkan keperluan standard MS ISO 9001: 2008. Sistem ini dilaksanakan di Ibu Pejabat JAS dan semua 15 pejabat negeri. Audit pemantauan oleh SIRIM QAS International Sdn Bhd telah dijalankan pada 19 hingga 22 Disember 2011 di Ibu Pejabat JAS, JAS Perak dan JAS Sabah.

MS ISO 9001: 2008 Certification

DOE had obtained the MS ISO 9001: 2008, a Quality Management System certification on 19 March 2010 for the processing of EIA Reports and enforcement of EIA approval conditions. The system is implemented at DOE headquarters and all 15 state offices. Surveillance audit by SIRIM QAS International Sdn Bhd had been carried out from 19 to 22 December 2011 at DOE headquarters, DOE Perak and Sabah Offices.

Business Licensing Electronic Support System (BLESS)

JAS telah bekerjasama dengan Unit Penyelarasan Pelaksanaan (ICU), Jabatan Perdana Menteri untuk membangunkan sistem permohonan atas talian melalui laman web BLESS. Setakat 2011, sebanyak 17 jenis permohonan boleh dikemukakan secara atas talian oleh pemohon melalui BLESS. Fasa satu pelaksanaan hanya terhad kepada pemohon dalam sektor pengilangan, perhotelan dan pembinaan di Negeri Selangor dan Wilayah Persekutuan Kuala Lumpur sahaja.

Business Licensing Electronic Support System (BLESS)

DOE in collaboration with the Implementation and Coordination Unit (ICU), Prime Minister's Department developed an on-line application system which can be accessed through BLESS website. As of 2011, there were 17 type of applications available on-line through BLESS. The first phase of implementation is available to applicants in the manufacturing, hoteling and construction sector from Selangor state and Federal Territory of Kuala Lumpur.

Pembangunan antara muka yang mengintegrasikan BLESS dan Sistem Pangkalan Data EIA JAS juga telah siap dibangunkan pada tahun 2011.

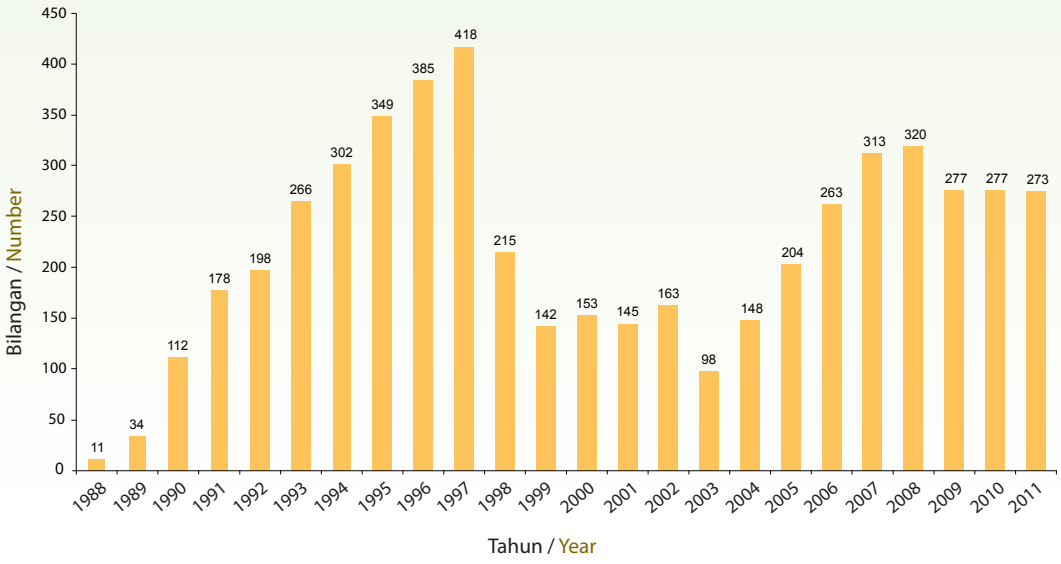
The development of interface integrating the BLESS and DOE in-house EIA Database System was also completed in 2011.

Sistem Pangkalan Data EIA

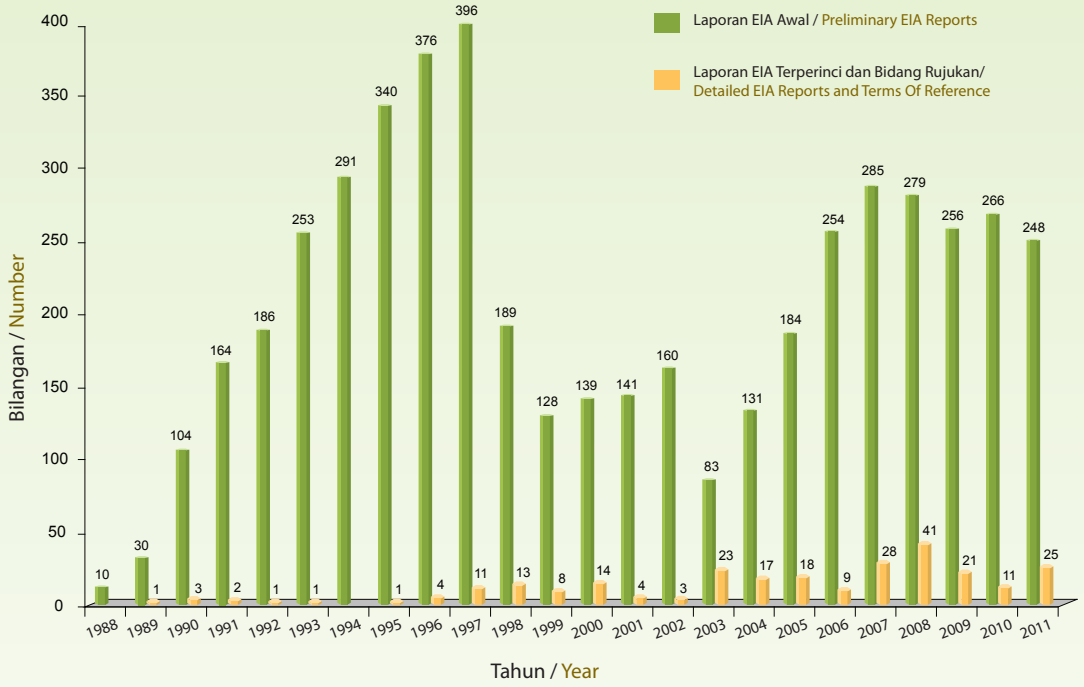
JAS telah membangunkan Sistem Pangkalan Data EIA bagi tujuan pemantauan piagam pelanggan. Pelaksanaan sistem ini membolehkan maklumat terkini mengenai semua Laporan EIA yang sedang diproses di JAS Ibupejabat dan semua JAS Negeri beserta ringkasan eksekutif dipaparkan terus di laman web JAS. Laman web JAS juga memaparkan senarai laporan EIA yang telah diluluskan dan yang tidak diluluskan.

EIA Database System

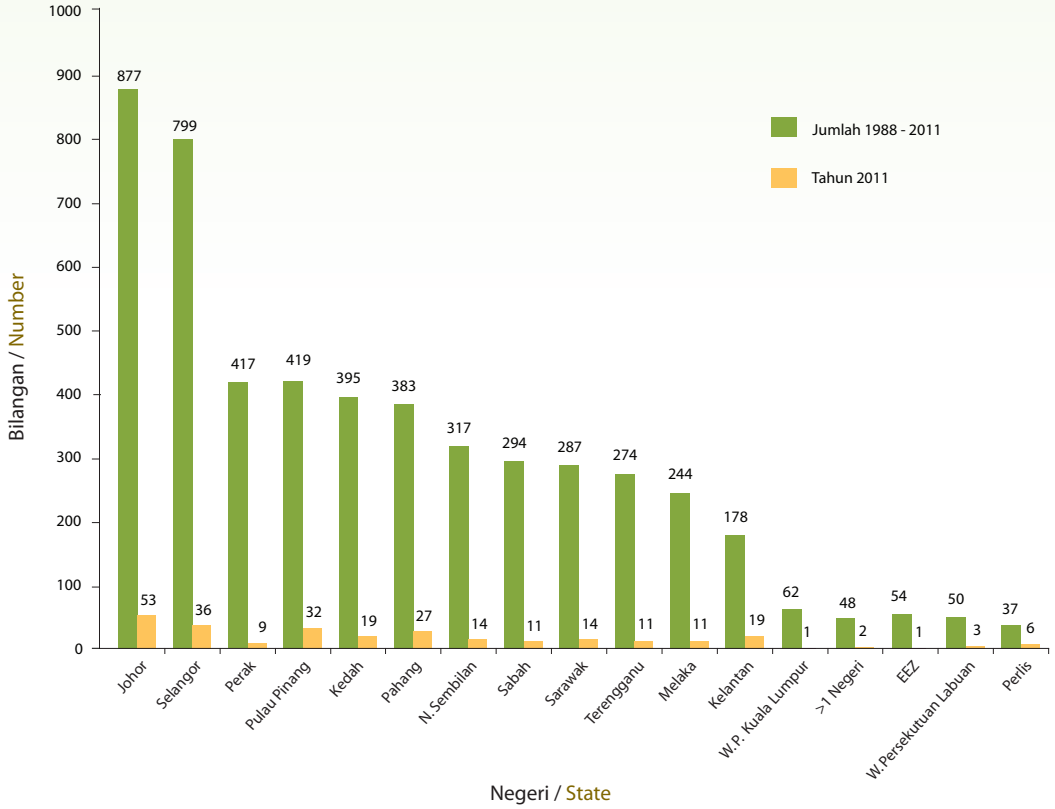
DOE had developed an EIA Database System to ensure all reports are being processed within the DOEs client charter. The implemention of this system enable the latest information relating to EIA Reports submitted to DOE Headquarters and all state offices to be published in DOE's website together with its respective executive summary. The list of EIA reports approved and not approved can also be viewed from the web.



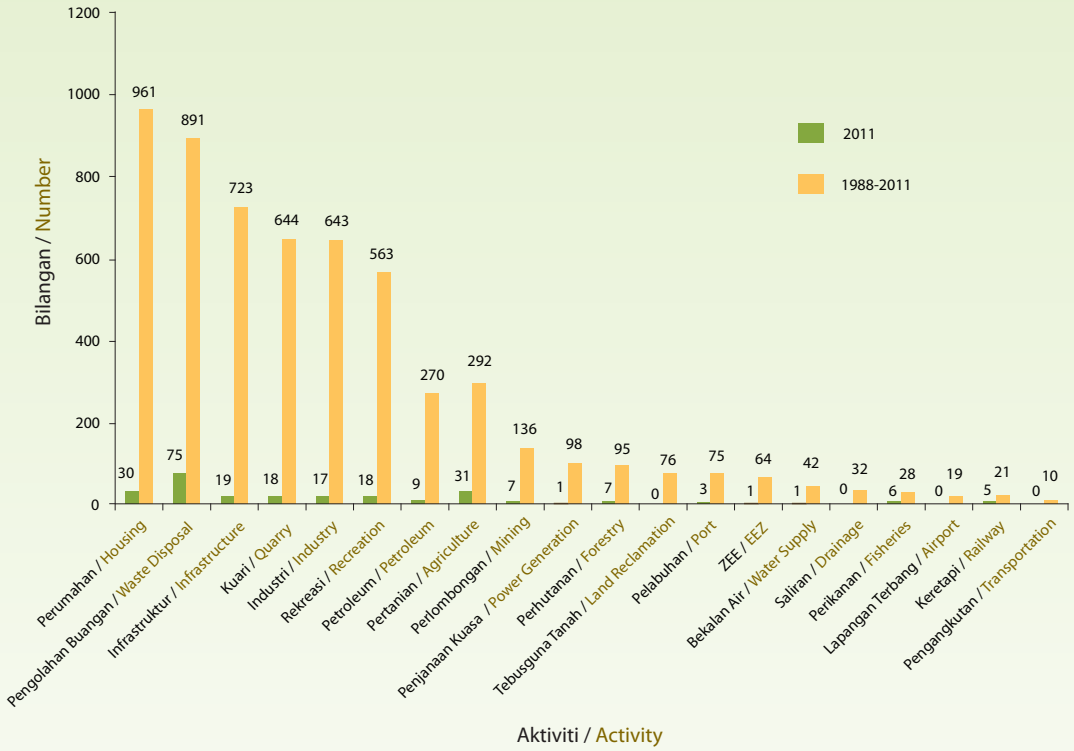
Rajah 3.1 JAS: Bilangan Laporan EIA Yang Diterima Mengikut Tahun, 1988-2011
Figure 3.1 DOE: Number of EIA Reports Received By Year, 1988-2011



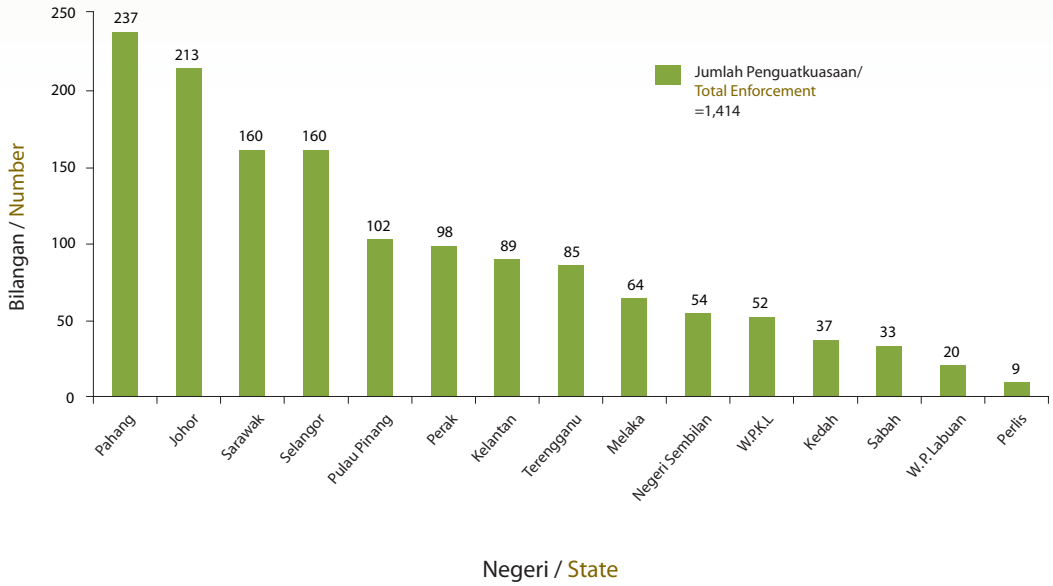
Rajah 3.2 JAS: Bilangan Laporan EIA dan Jenis Laporan Diterima, 1988 - 2011
Figure 3.2 DOE: Number and Type of EIA Reports Received, 1988 - 2011



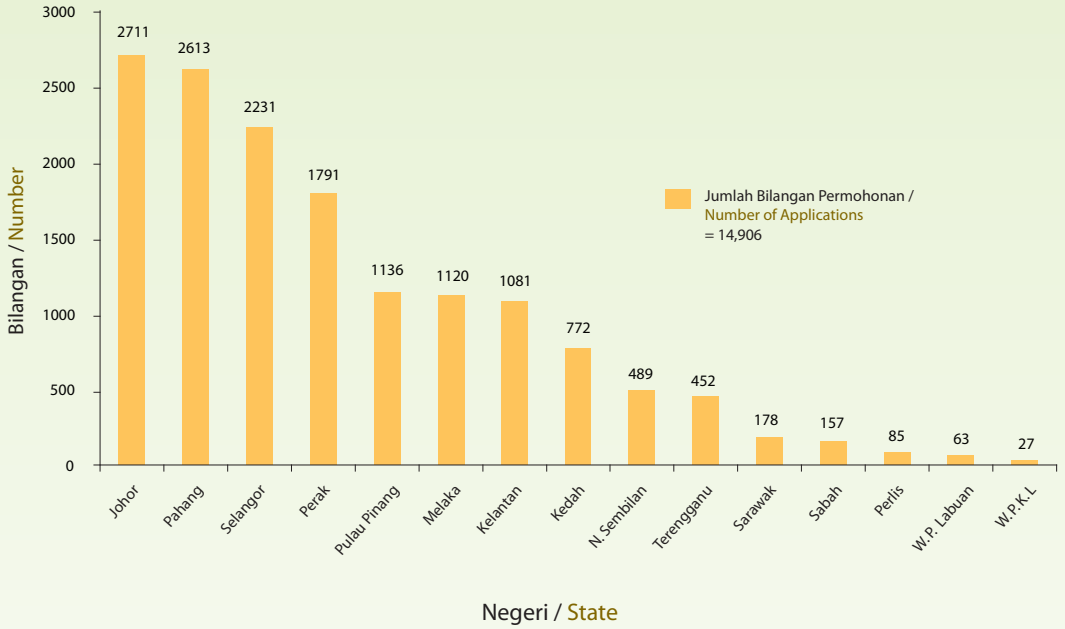
Rajah 3.3 JAS: Bilangan Laporan EIA Yang Diterima Mengikut Negeri, 1988 - 2011
Figure3.3 DOE: Number of EIA Reports Received By State 1988 - 2011



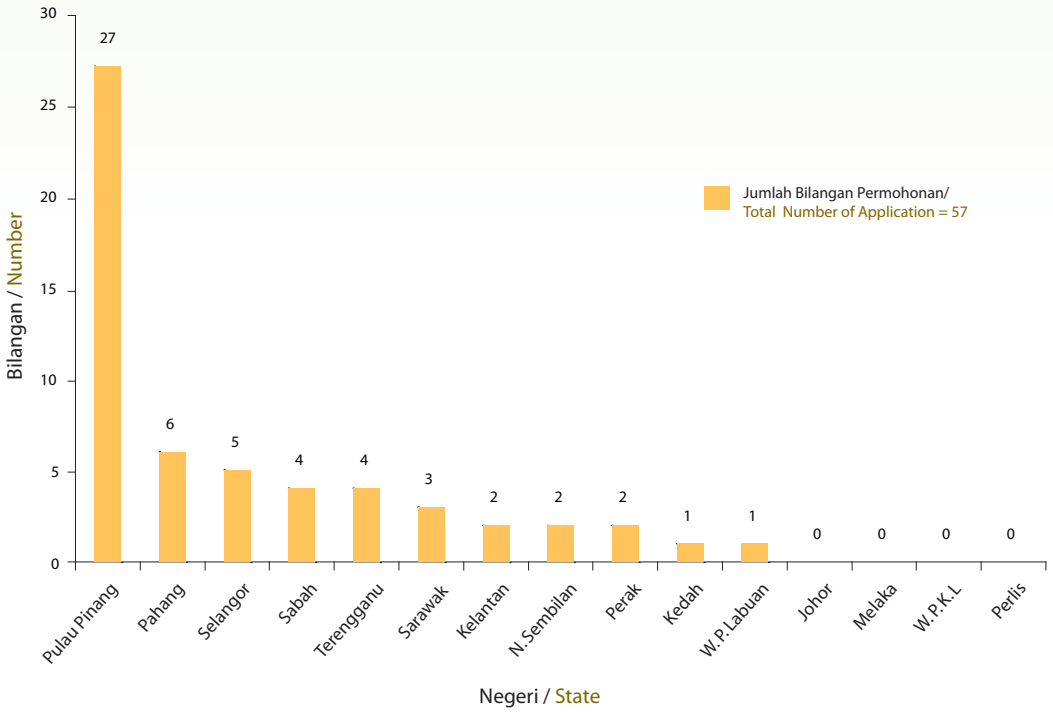
Rajah 3.4 JAS: Bilangan Laporan EIA yang Diterima Mengikut Aktiviti, 1988 - 2011
Figure 3.4 DOE: Number of EIA Report Received by Activity, 1988 - 2011



Rajah 3.5 JAS: Siasatan Penguatkuasaan Projek EIA, 2011
Figure 3.5 DOE: Post EIA Enforcement Investigation, 2011



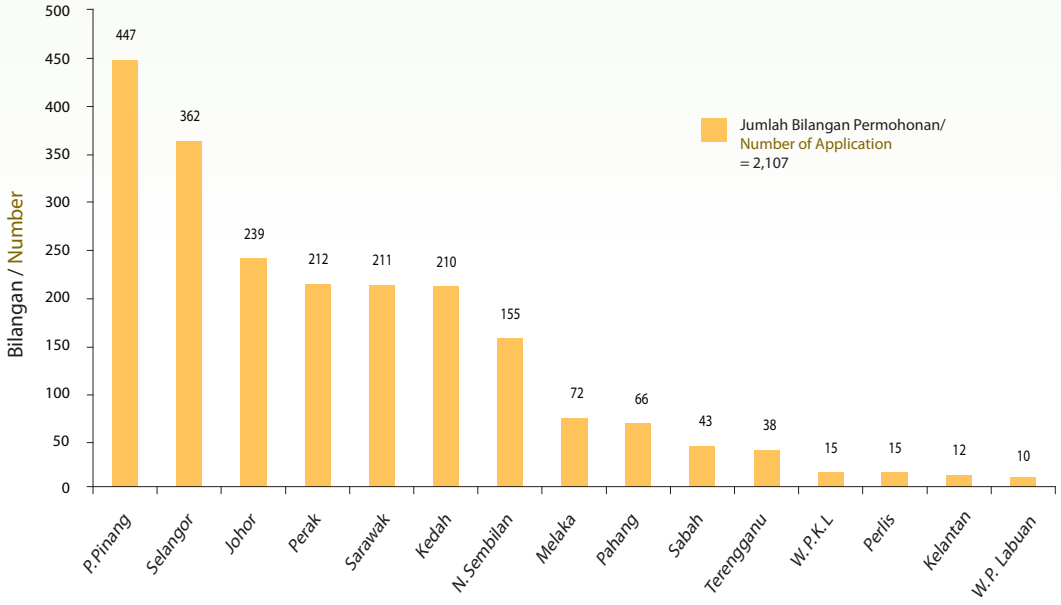
Rajah 3.6 JAS: Penilaian Awal Tapak Untuk Pembangunan Projek- Projek Pembangunan Negeri, 2011
Figure 3.6 DOE: Pre-Sitting Evaluation of Development Projects By State, 2011



Rajah 3.7A JAS: Pemberitahuan Bertulis Bagi Punca Baru Pembuangan atau Pelepasan Kumbahan, 2011
Figure 3.7A DOE: Notification For New Sources of Sewage Discharge or Release, 2011

Rajah 3.7B JAS: Pemberitahuan Bertulis Bagi Punca Baru Atau Yang Diubah Efluen Perindustrian atau Efluen Bercampur, 2011

Figure 3.7B DOE: Notification For New Or Altered Sources of Discharge of Industrial Effluent Or Mixed Effluent, 2011



Rajah 3.8 JAS: Permohonan Bagi Pemasangan Alat Kawalan Pencemaran Udara Mengikut Negeri, 2011

Figure 3.8 DOE: Application for Installation of Air Pollution Control Equipment By State, 2011

Rajah 3.9 JAS: Permohonan Bagi Pemasangan Alat Pembakaran Bahan Api Mengikut Negeri, 2011
Figure 3.9 DOE: Application for Installation of Fuel Burning Equipment By State, 2011

Jadual 3.1 JAS: Jumlah Permohonan Jururunding Yang Diluluskan, 2011
Table 3.1 DOE: Number of Approved Consultant Applications, 2011

Kategori / Category	Jumlah Permohonan / No. of Applications	Jumlah Lulus / No. of Applications Approved	Peratusan Lulus (%) / Percentage Approved (%)
Jururunding EIA / EIA Consultant	16	16	100%
Jururunding Subjek / Subject Consultant	22	15	68%
Penolong Jururunding Assistant Consultant	53	29	55%
Jumlah/ Total	**91**	**60**	**66%**

Jadual 3.2 JAS: Jumlah Keseluruhan Jururunding Berdaftar sehingga 31 Disember, 2011
Table 3.2 DOE: Number of Registered Consultants until 31 December, 2011

Perkara / Category	Jumlah Diluluskan / No. of Applications Approved	Peratusan (%) / Percentage (%)
Jururunding EIA / EIA Consultant	249	25%
Jururunding Subjek / Subject Consultant	342	35%
Penolong Jururunding / Assistant Consultant	390	40%
Jumlah / Total	**981**	**100%**

Jadual 3.3 JAS: Kursus Induksi EIA untuk Jururunding EIA
Table 3.3 DOE: Induction Course For EIA Consultants

Bil. / No.	Kursus / Course	Tarikh / Date	Tempat / Venue
1	Kursus Induksi EIA untuk Jururunding EIA Bil. 1/11 EIA Induction Course 1/11	16 – 17 Mac 2011 16 – 17 March 2011	Hotel Residence, UNITEN
2	Kursus Induksi EIA untuk Jururunding EIA Bil. 2/11 EIA Induction Course 2/11	13 – 14 April 2011 13 – 14 April 2011	JAS Sarawak
3	Kursus Induksi EIA untuk Jururunding EIA Bil. 3/11 EIA Induction Course 3/11	15 – 16 Jun 2011 15 – 16 June 2011	Puri Pujangga, UKM
4	Kursus Induksi EIA untuk Jururunding EIA Bil. 4/11 EIA Induction Course 4/11	12 – 13 Oktober 2011 12 – 13 October 2011	Puri Pujangga, UKM

Jadual 3.4 JAS: Jumlah Permohonan Juruaudit yang Diluluskan Bagi Tahun 2011
Table 3.4 DOE: Number of Auditor Applications Approved in 2011

Jumlah Permohonan / No of Applicants	Jumlah Lulus / No. of Applications Approved	Peratusan Lulus / Percentage Approved
9	6	66.67%

Jadual 3.5 JAS: Jumlah Keseluruhan Juruaudit Berdaftar Sehingga 31 Disember, 2011
Table 3.5 DOE: Number Of Registered Environmental Auditor Until 31 December, 2011

Perkara / Category	Jumlah Diluluskan / No. of Applications Approved
Juruaudit yang didaftarkan bagi tahun 2009 / Environmental Auditors registered in 2009	38
Juruaudit yang didaftarkan bagi tahun 2010 / Environmental Auditors registered in 2010	8
Juruaudit yang didaftarkan bagi tahun 2011 / Environmental Auditors registered in 2011	6
Jumlah / Total	52

Nota : Tahun 2009, Jumlah asal juruaudit adalah 41, namun tiga (3) auditor tidak memperbaharui pendaftaran mereka.
Note : Number of auditors registered in 2009 is 41, out of that three (3) auditors did not renew their registration and has been delisted.

Jadual 3.6 JAS: Kursus Induksi EIA Untuk Juruaudit Alam Sekitar
Table 3.6 DOE: Induction Course For Environmental Auditors

Bil. / No.	Kursus / Course	Tarikh / Date	Tempat / Venue
1.	Kursus Induksi Juruaudit Alam Sekitar Bil 1/11 Induction Courses for Environmental Auditors 1/11	4 – 7 Julai / July 2011	Puri Pujangga, UKM

BAB 4 / CHAPTER 4

PENGAWASAN KUALITI UDARA
AIR QUALITY MONITORING

Malaysia mempunyai rangkaian 52 buah stesen pengawasan kualiti udara automatik yang ditempatkan di seluruh negara bagi memantau sebarang perubahan ketara kepada status kualiti udara sesuatu tempat atau kawasan yang mungkin memberi kesan kepada kesihatan awam dan alam sekitar.

Malaysia's air quality monitoring network consists of 52 stations that are located throughout the country to monitor and to detect any significant changes in the air quality that can contribute negative impact on human health and the environment.

Lokasi-lokasi yang strategik dipilih bagi penempatan stesen-stesen pengawasan kualiti udara ini sejajar dengan objektif program pengawasan yang spesifik. (**Peta 4.1** dan **4.2**) Bagi memastikan tahap pendedahan pencemar udara kepada orang awam sentiasa diawasi, kebanyakan penempatan stesen diutamakan dalam kawasan perumahan dan selebihnya ditempatkan dalam kawasan industri dan kawasan bandar yang sibuk dengan trafik.

These monitoring stations are strategically located to meet specific monitoring objectives. (**Map 4.1** and **4.2**). Most stations are located in residential areas to ensure the air quality exposed to the public is continuously monitored. The rest of the stations are located within industrial areas and in city areas with high traffic volume.

Rangkaian stesen pengawasan kualiti udara di negara ini juga turut dilengkapi dengan stesen-stesen pengawasan kualiti udara secara manual yang ditempatkan di 14 buah lokasi yang berbeza. Pengawasan di stesen-stesen manual melibatkan parameter-parameter seperti pepejal terampai, habuk halus bersaiz kurang dari 10 mikron (PM_{10}) dan beberapa jenis logam berat termasuk plumbum yang diukur setiap enam (6) hari dalam satu bulan menggunakan alat "High Volume Samplers"

The National Air Quality Monitoring Network is also complemented by manual air quality monitoring stations located at 14 different sites. At these sites, total suspended particulate, particulate matter (PM_{10}) and several heavy metals including lead are measured at intervals of six (6) days a month using High Volume Samplers.

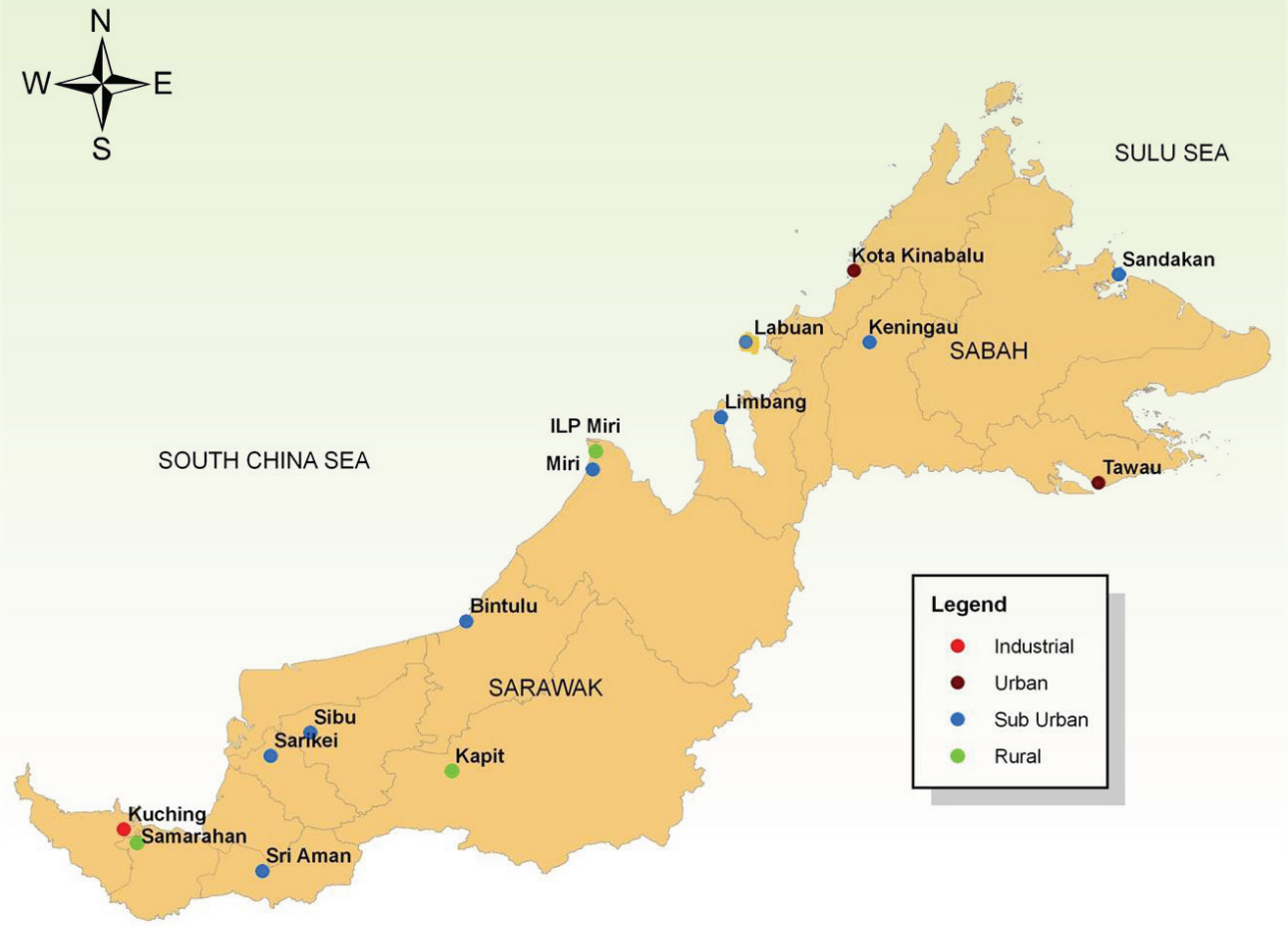
Status Kualiti Udara Bagi Tahun 2011

Pada keseluruhannya, terdapat sedikit kemerosotan kualiti udara di negara ini pada tahun 2011 di mana bilangan hari udara bersih menurun dari 62.8 peratus tahun 2010 kepada 55.31 peratus bagi tahun 2011. Terdapat peningkatan bilangan hari di dalam kategori sederhana di mana bilangan hari sederhana dicatatkan meningkat kepada 43.1 peratus berbanding 36.8 peratus pada tahun 2010. Walau bagaimanapun, bilangan hari tidak sihat pada tahun 2011 adalah lebih rendah iaitu 0.78 peratus berbanding 0.98 peratus pada tahun 2010 dan tiada dicatatkan sebarang hari berbahaya pada tahun 2011. Penurunan kualiti udara ini adalah disebabkan oleh pencemaran jerebu merentasi sempadan berpunca dari pembakaran tanah dan hutan di Sumatera Tengah dan Kalimantan Barat, Indonesia.

Air Quality Status In 2011

The overall air quality status in the country showed a slight deterioration with the number of good air quality days decreased from 62.8 percent in 2010 to 55.31 percent in 2011. There was a slight increase in the number of moderate air quality days (43.1 percent) in 2011 as compared to 36.8 percent in 2010. However, the number of unhealthy days was reduced from 0.98 percent in 2010 to 0.78 percent in 2011 and there was no hazardous days recorded in 2011. The slight deterioration of the air quality was mainly due to the transboundary haze pollution as a result of land and forest fires in Central Sumatera and West Kalimantan, Indonesia

Peta 4.1 Semenanjung Malaysia: Lokasi Stesen Pengawasan Kualiti Udara Automatik, 2011
Map 4.1 Peninsular Malaysia: Location of Continuous Air Quality Monitoring Station, 2011



Peta 4.2 Sabah & Sarawak: Lokasi Stesen Pengawasan Kualiti Udara Automatik, 2011
Map 4.2 Sabah & Sarawak: Location of Continuous Air Quality Monitoring Station, 2011

PROGRAM PENCEGAHAN KEBAKARAN DAN PENGURUSAN TANAH GAMBUT
FIRE PREVENTION AND PEATLAND MANAGEMENT PROGRAMME

Pencemaran jerebu mengundang pelbagai impak negatif kepada negara, tidak terhad dengan kemerosotan kesihatan orang awam, sekiranya masalah ini tidak dapat dicegah dan dikawal, ianya boleh menjejaskan aktiviti ekonomi di dalam negara sekaligus memberi impak kepada hasil pendapatan negara.

Haze pollution often induced negative impact to the country. Amidst the deterioration of public health, if it was not controlled effectively, the haze pollution might also affect the country's economic activities and income of the country.

Inisiatif mencegah kebakaran gambut sebagai salah satu usaha untuk menangani pencemaran jerebu di peringkat tempatan ini telah dimulakan pada tahun 2009 dengan pembinaan tiga (3) jenis infrastruktur iaitu sekatan saliran, telaga air tanah serta menara tinjau.

The initiative to prevent peat fires started in 2009 with the construction of three (3) types of infrastructures, which were check dams, tube wells and watch towers.

Inisiatif ini dilaksanakan dengan semangat 1NRE, yang melibatkan kerjasama erat pelbagai agensi yang bernaung di bawah Kementerian Sumber Asli dan Alam Sekitar (NRE) iaitu JAS, Jabatan Pengairan dan Saliran (JPS), Jabatan Mineral dan Geosains (JMG) serta Jabatan Perhutanan Semenanjung Malaysia (JPSM).

This initiative was made possible under the 1NRE spirit that involved cooperation within agencies under the Ministry of Natural Resources and Environment (NRE) among others are DOE, Department of Irrigation and Drainage (DID), Department of Mineral and Geosciences (MGD) and Forestry Department of Malaysia.

SEKATAN SALIRAN / CHECK DAM

Menyekat pengeluaran air gambut secara berlebihan supaya tidak menyebabkannya kering dan mudah terbakar / To prevent excess peat water discharge, that make it dried and fire-prone.

Mengekalkan paras minimum air gambut bagi mengekalkan kelembapan tanah gambut / To maintain minimum water level so as to retain the peatland humidity.

TELAGA AIR TANAH / TUBE WELL

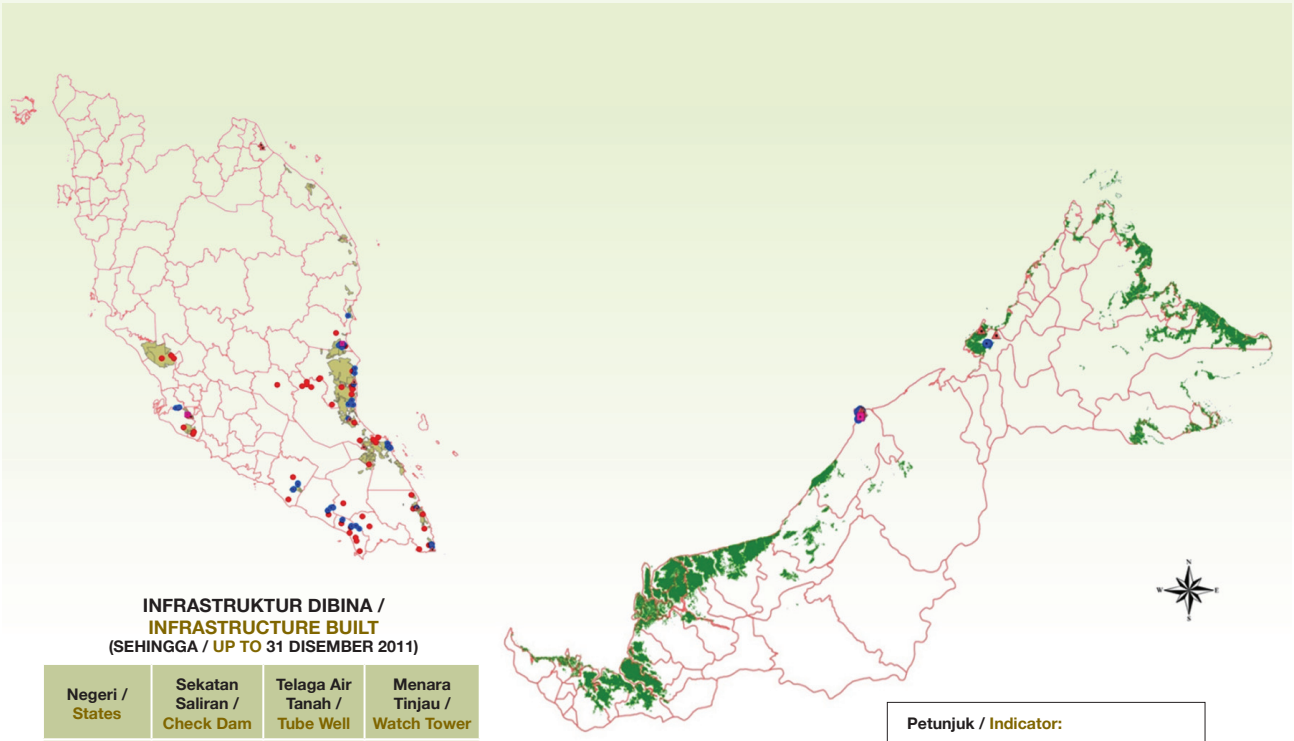
Sumber air alternatif bagi meningkatkan kelembapan gambut dan memadam kebakaran / The alternative water resource to increase the peatland humidity and to put out peat-fires.

MENARA TINJAU / WATCH TOWER

Memantau kebakaran gambut secara berterusan / To monitor the peat fires continuously

Program ini mula menampakkan keberkesanannya apabila jumlah kebakaran di kawasan gambut didapati berkurangan pada tahun 2010, berbanding tahun 2009 ketika program ini mula dilaksanakan. Pada tahun 2011, inisiatif ini diteruskan di bawah Rancangan Malaysia Kesepuluh (RMKe-10) dengan melibatkan kerjasama lebih banyak agensi pelaksana seperti Ikatan Relawan Rakyat Malaysia (RELA) di Negeri Pahang, Selangor dan Sarawak, Jabatan Perhutanan Negeri Sabah (JPN Sabah), Majlis Bandaraya Miri, Sarawak serta Jabatan Meteorologi Malaysia (JMM). Sehingga 31 Disember 2011, sebanyak 102 buah sekatan saliran, 21 buah telaga air tanah dan tiga (3) buah menara tinjau telah dibina di kawasan-kawasan tanah gambut yang mudah terbakar di Negeri Johor, Pahang, Selangor, Kelantan, Sarawak dan Sabah. (**Rajah 4.1**).

The programme was proven effective when the number of fire occurrence in the peat areas in 2010 was very much reduced compared to 2009 when the programme first started. The initiative was continued under the Tenth Malaysia Plan (10MP) in collaboration with more implementing agencies such as RELA in Pahang, Selangor and Sarawak states, Sabah State Forestry Department, Miri City Council, Sarawak as well as Malaysian Meteorological Department (MMD). As of 31 December 2011, 102 check dams, 21 tube wells, and three (3) watch towers were built in the peatland areas which were fire prone in Johor, Pahang, Selangor, Kelantan, Sarawak and Sabah. (**Figure 4.1**).



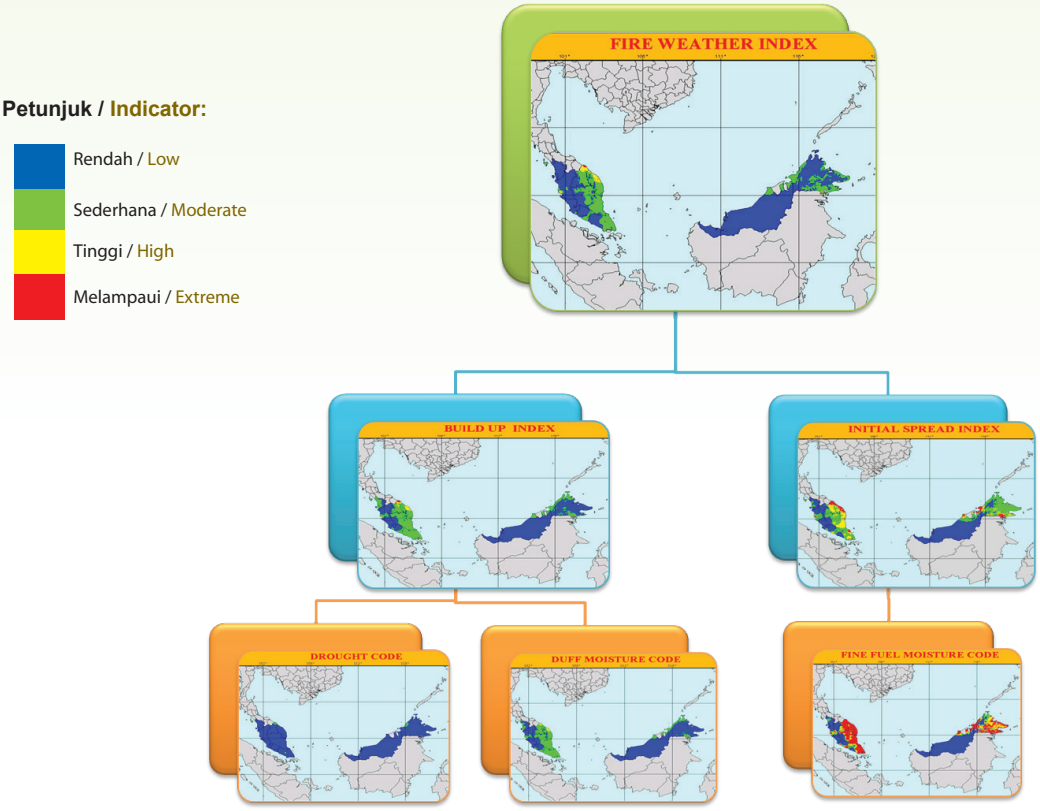
INFRASTRUKTUR DIBINA / INFRASTRUCTURE BUILT
(SEHINGGA / UP TO 31 DISEMBER 2011)

Negeri / States	Sekatan Saliran / Check Dam	Telaga Air Tanah / Tube Well	Menara Tinjau / Watch Tower
Pahang	20	7	1
Sarawak	16	6	1
Selangor	5	2	1
Johor	54	2	-
Kelantan	4	2	-
Sabah	3	2	-
Jumlah	21	21	3

Rajah 4.1: Peta Lokasi Pembinaan Infrastruktur di bawah Program Pencegahan Kebakaran dan Pengurusan Tanah Gambut Yang Sering Terbakar di Malaysia
Figure 4.1: Location map of the Infrastructures built under the Peatland Fire Prevention and Management Programme in Malaysia

Bermula pada tahun 2011 juga, aplikasi *Fire Danger Rating System* (FDRS) yang dibangunkan oleh JMM (**Rajah 4.2**) telah digunapakai bagi memperkemas sistem amaran awal mencegah kebakaran tanah gambut selain dari mekanisma pemantauan *hotspot*. Satu projek perintis telah dimulakan di Negeri Selangor pada tahun 2011 bertujuan untuk mempertingkatkan keupayaan sistem dengan melaksanakan verifikasi untuk menentukan sama ada FDRS sesuai digunakan sebagai mekanisma amaran awal mencegah kebakaran tanah gambut. Proses verifikasi bagi projek printis memberi keputusan positif untuk FDRS digunakan bagi mencegah kebakaran gambut di Selangor. Namun begitu, penggunaan FDRS secara rasmi di seluruh Malaysia masih di peringkat percubaan. JMM sedang dalam proses penambahbaikan dan mengemaskini sistem ini bagi menjadikannya satu sistem yang boleh digunapakai secara berkesan bukan sahaja di peringkat negara tetapi juga di peringkat serantau bagi menangani isu pencemaran jerebu merentas sempadan.

Starting in 2011, an application of 'Fire Danger Rating System' (FDRS) was developed by the MMD (**Figure 4.2**) as an alert system for prevention of peatland fires apart from hotspot monitoring. A pilot project was implemented in Selangor to further enhance the system by verification to determine whether the FDRS is suitable and sufficiently effective to be used as an alert mechanism to prevent peatland fires. The verification process for the pilot project showed positive indication for the FDRS to be used as a tool to prevent peatfires in Selangor. However, implementation of the FDRS throughout the country is still being tested. In the meantime the MMD is in the process of enhancing and upgrading the system to make it more effective to be used not only in the country but also in the region to prevent transboundary haze pollution.



Rajah 4.2: Fire Danger Rating System (FDRS) yang dibangunkan oleh Jabatan Meteorologi Malaysia (JMM) yang diadaptasi daripada Canadian Forest Fire Danger Rating System (CFFDRS) menggunakan kod amaran berwarna bertujuan mencegah kebakaran di Malaysia serta Asia Tenggara

Figure 4.2: Fire Danger Rating System (FDRS) developed by the Malaysian Meteorological Department (MMD) adapting from the Canadian Forest Fire Danger Rating System (CFFDRS) using the colour coding alert to prevent fires in Malaysia as well as in the South East Asia.

Sekatan saliran baru menggunakan rekabentuk guni pasir
di kawasan pengairan IADA di Bachok Kelantan /
New gunny sack designed check dam at IADA irrigation scheme area in Bachok, Kelantan

PROTOKOL MONTREAL DAN PERLINDUNGAN LAPISAN OZON
MONTREAL PROTOCOL AND PROTECTION OF THE OZONE LAYER

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 akan dihapuskan pengimportan mulai 2015 dan hidroklorofluorokarbon (HCFC) pada 2030.

Pematuhan Terhadap Protokol Montreal

Mulai 1 Januari 2010 tiada lagi pengimportan CFC, CTC dan halon dibenarkan. Bagi fasa seterusnya Malaysia perlu menghapuskan penggunaan HCFC secara berperingkat sehingga 2030 seperti yang telah ditetapkan di bawah Protokol Montreal. Bagi mencapai sasaran ini, Pelan Pengurusan Penghapusan HCFC (HPMP) yang menggariskan polisi dan strategi jangka masa panjang untuk menghapuskan penggunaan HCFC mengikut jadual penghapusan di bawah obligasi Protokol Montreal telah disediakan. **Rajah 4.3** menunjukkan pengimportan HCFC pada tahun 2011 yang berjumlah 6083.32 metrik tan. HPMP yang mengandungi polisi dan strategi termasuk projek-projek penghapusan HCFC di 17 buah industri dalam sektor busa telah mendapat kelulusan bantuan kewangan sejumlah USD 9,587,470 dari Tabung 'Multilateral Montreal Protocol' di mesyuarat ke 65 Jawatankuasa Eksekutif pada 13-17 November, di Bali Indonesia.

Pengurusan Halon

Halon tidak lagi digunakan bagi pemasangan baru sistem kawalan kebakaran dan alat-alat pemadam api di Malaysia. Sebaliknya, karbon dioksida atau serbuk kimia 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

Background

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

Compliance to Montreal Protocol

As of 1 January 2010, the importation of CFC, CTC and halon are no longer allowed. For the next phase, Malaysia needs to phase out the use of HCFC in stages by 2030, as stipulated under the Montreal Protocol. To meet this target, the HCFC Phase-out Management Plan (HPMP), outlining the policies and long term strategies for the phase-out of HCFC according to the Montreal Protocol obligated phase-out schedule had been prepared. **Figure 4.3** shows the importation of HCFC in 2011 which amounted to 6083.32 metric tonnes. The 65th Meeting of Executive Committee in Bali, Indonesia on 13-17 November 2011, approved a funding of USD 9,587,470 under the Montreal Protocol Multilateral Fund for implementation of policies and strategies as outlined in the HPMP which includes investment project to phase out HCFC in 17 industries in foam sector.

Halon Management

Halon is no longer used in Malaysia for new installation of fire protection system and fire extinguishers. Instead, carbon dioxide or chemical powders are now being used as alternatives. However, halon is still allowed and restricted for use in military and civil aviation fire safety protection systems, as agreed under the Montreal Protocol. As of 2011, 7,144 kg Halon 1211 and 262,785 kg Halon 1301 were collected

Montreal. Sehingga tahun 2011, sebanyak 7,144 kg Halon 1211 dan sebanyak 262,785 kg Halon 1301 yang dikumpulkan disimpan di Pusat Bank Halon Kebangsaan di Kuala Kubu Bahru, Selangor. Penggunaan sebarang sistem pencegahan kebakaran yang menggunakan alternatif kepada halon perlu mendapat kelulusan bertulis daripada Jabatan Bomba dan Penyelamat Malaysia terlebih dahulu sebelum sistem tersebut digunakan.

Penghapusan Metil Bromida

Tabung *MLF* telah menyediakan dana projek sebanyak USD 200,000 bagi bantuan teknikal untuk penggunaan alternatif bagi menghapuskan penggunaan metil bromida di Malaysia di dalam aktiviti bukan kuarantin dan pra-perkapalan.

Di bawah program bantuan teknikal ini, satu Projek Demonstrasi Mengenai Alternatif-Alternatif Metil Bromida Dalam Fumigasi Tanah telah dijalankan di Cameron Highlands mulai bulan Mei 2009 hingga Mac 2010. Satu seminar bagi menyebarkan hasil Projek ini dijalankan pada 27 April 2011 di Cameron Highlands, Pahang dan 13 Julai 2011 di Ipoh, Perak.

Program dan Kempen Kesedaran

Sempena sambutan Hari Ozon Antarabangsa iaitu pada 16 September 2011, pengumumannya telah dibuat melalui laporan khas Berita Nasional, Radio dan Television Malaysia. Perutusan Menteri Sumber Asli dan Alam Sekitar telah dimuatkan di laman web JAS. Tema Hari Ozon 2011 ialah "**HCFC Phase-out: A Unique Opportunity**' atau 'Penghapusan HCFC: Satu peluang yang Unik. Sempena sambutan Hari Ozon Antarabangsa, satu seminar mengenai Teknologi Alternatif Kepada HCFC telah dianjurkan pada 12 Oktober 2011 di Hotel Pullman Lakeside, Putrajaya. Pada hari tersebut juga Y.B. Tan Sri Datuk Seri Panglima Joseph Kurup, Timbalan Menteri Sumber Asli dan Alam Sekitar telah melancarkan setem bertemakan perlindungan lapisan ozon. Risalah-risalah mengenai perlindungan lapisan ozon dan penghapusan bahan pemusnah lapisan ozon HCFC serta Buletin Ozon yang diterbitkan oleh JAS telah diedarkan. Perincian program kesedaran yang dijalankan sepanjang tahun 2011 dan mesyuarat antarabangsa yang dihadiri JAS seperti di **Jadual 4.1** dan **Jadual 4.2**.

and stored at the National Halon Bank Centre at Kuala Kubu Bahru, Selangor. Prior written approval from the Fire and Rescue Department of Malaysia is required for usage of alternatives to halon in any new fire fighting system.

Methyl Bromide Phase Out

The MLF provided a project grant of USD 200,000 for technical assistance in the usage of alternatives to phase out all remaining non-quarantine and pre-shipment (non-QPS) uses of methyl bromide in Malaysia.

Under this technical assistance programme, a Demonstration Project on Methyl Bromide Alternatives in Soil Fumigation was carried out in Cameron Highlands from May 2009 till March 2010. Seminars to disseminate results of this Project were held in Cameron Highlands, Pahang on 27 April 2011 and in Ipoh, Perak on 13 July 2011.

Awareness Programmes and Campaigns

In conjunction with the International Ozone Day Celebration on 16 September 2011, special announcements were made on Radio and Television Malaysia. A message from the Minister of Natural Resources and Environment was published in the DOE website. The theme for the 2011 International Ozone Day was: "**HCFC Phase-out: A Unique Opportunity**'. To commemorate this day, a seminar on Alternative Technologies for HCFC Phase-out was held on 12 October 2011 at Pullman Lakeside Hotel, Putrajaya. At the same occasion Y.B Tan Sri Datuk Seri Panglima Joseph Kurup, Deputy Minister of Environment launched the specially designed stamps to convey message on ozone layer protection. Pamphlets on ozone layer protection and HCFC phase-out as well as the Ozone Bulletin published by the DOE were distributed. Details of awareness programmes carried out in 2011 are listed in **Table 4.1**. Meetings at regional and international levels attended by DOE officers are listed in **Table 4.2**

Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Pengurusan Refrigeran) 1999

Premis-premis yang menyediakan perkhidmatan penyelenggaraan penghawa dingin kenderaan (MAC) dan premis-premis berkaitan sektor servis refrigeran (RSS) adalah tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Pengurusan Refrigeran) 1999. Selaras dengan keperluan peraturan ini, JAS telah menganjurkan Program Pentauliahan Juruteknik Servis RSS dan Program Pentauliahan Juruteknik Servis MAC untuk melatih dan mentauliahkan juruteknik yang mengendalikan apa-apa refrigeran.

Pada tahun 2011, sebanyak 234 lawatan penguatkuasaan telah dilaksanakan tehadap premis-premis RSS dan MAC

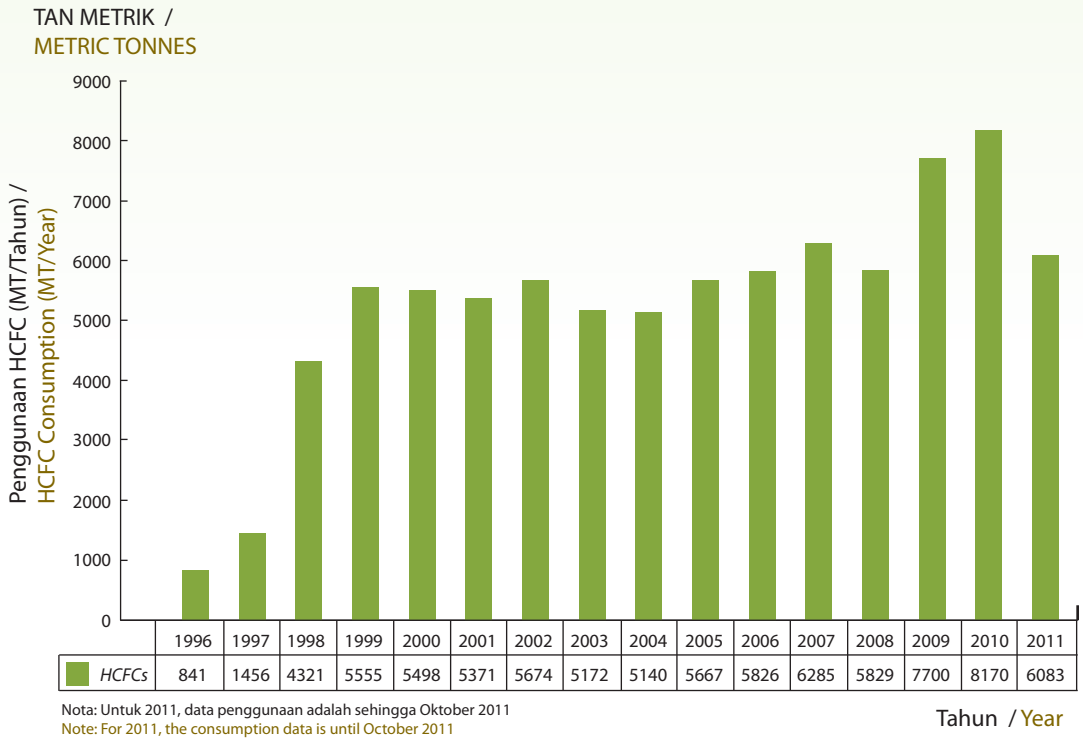
Perincian program ini adalah seperti disenaraikan dalam **Jadual 4.3**.

Compliance to Environmental Quality (Refrigerant Management) Regulations 1999

Premises which provide Mobile Air Conditioning (MAC) servicing and Refrigeration Service Sector (RSS) are subjected to the Environmental Quality (Refrigerant Management) Regulations 1999. As per requirement under the law, DOE has conducted the Certification of MAC Service Technicians Programme and the Certification of RSS Service Technicians Programme to train and certify the service technicians who are involved in handling refrigerants.

In 2011, 234 enforcement visits had been conducted on RSS and MAC premises.

Details of these programme are as listed in **Table 4.3**



Rajah 4.3 JAS: Tren Penggunaan HCFC Di Malaysia, 1996 -2011
Figure 4.3 DOE: Malaysia HCFC Consumption Trend, 1996 -2011

Jadual 4.1 JAS: Aktiviti-Aktiviti Kesedaran 2011
Table 4.1 DOE: Public Awareness Activities 2011

Tarikh Date	Aktiviti & Program Activities & Programme	Tempat Venue
5-6 Mei / 5-6 May	Bengkel Konsultatif HPMP dengan Industri Industrial Stakeholder Consultative Meeting	Hotel Holiday Villa,Subang Jaya, Selangor Holiday Villa Hotel, Subang Jaya, Selangor
12 Oktober / 12 October	Sambutan Hari Ozon Antarabangsa Peringkat Kebangsaan International Ozon Day Celebration	Hotel Pullman Lakeside, Putrajaya Pullman Putrajaya Lakeside Hotel, Putrajaya
12 Oktober / 12 October	Seminar Alternatif Teknologi Kepada Penghapusan HCFC Seminar On Alternative Technology For HCFC Phase-Out	Hotel Pullman Lakeside, Putrajaya Pullman Putrajaya Lakeside Hotel, Putrajaya
6-8 Disember / 6-8 December	Kursus Penguatkuasaan Praktikal di Bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Pengurusan Refrigeran) 1999 Practical Enforcement Training Under The Regulation Of Environmental Quality Act 1974 (Refrigerant Management Regulation 1999)	Institut Latihan Keselamatan Sosial KWSP (ESSET), Bangi Employees Provident Fund Social Security Training Institute (ESSET), Bangi

Jadual 4.2 JAS: Mesyuarat-Mesyuarat dan Latihan Peringkat Serantau dan Antarabangsa
Table 4.2 DOE: Regional and International Meetings and Trainings

Tarikh Date	Aktiviti & Program Activities & Programme	Tempat Venue
16-29 Januari / 16-29 January	Seminar On Ozone Layer Protection And Global Warming Countermeasures – Measure To Reduce The Controlled Substance Of The Montreal Protocol and Kyoto Protocol	Tokyo, Japan
4-8 April / 4-8 April	The 63rd Executive Committee of Multilateral Fund Meeting (ExCom)	Montreal, Canada
18-20 Mei / 18-20 May	The 6th EAP/ENV Regional Ozone Depleting Substances (ODS) Workshop	Lebua Hotel, Bangkok, Thailand
14-17 Jun / 14-17 June	South East Asia Pacific ODS Network Meeting	Ho Chi Minh City, Vietnam
15-17 Jun / 15-17 June	EIA-UNEP Summit With The Private Sector On Trade In Ozone Depleting Substances	Ulaan Baatar, Mongolia
25-29 Julai / 25-29 July	The 64th Executive Committee of Multilateral Fund Meeting (ExCom)	Montreal, Canada
1-5 Ogos / 1-5 August	The 31st Meeting of Open-Ended Working Group on Montreal Protocol (OEWG)	Montreal, Canada
13-15 Oktober/ 13-15 October	Capacity Building Program For New Ozone Officers and Assistants For Ozone Officers In The Asia and The Pacific Region	Kathmandu, Nepal
17-19 Oktober/ 17-19 October	Joint Meeting Of South Asia (SA) and South East Asia And Pacific (SEAP) Networks Of ODS Officers "HCFC Phase-Out For An Energy Efficient Future"	Pokhara, Nepal
13-17 November / 13-17 November	The 65th Executive Committee of Multilateral Fund Meeting (ExCom)	Bali, Indonesia
21-25 November / 21-25 November	The Ninth Meeting of the Conference of the Parties to the Vienna Convention (COP 9) and The 23rd Meeting of Parties (MOP 23)	Bali, Indonesia

Jadual 4.3 JAS: Aktiviti-Aktiviti yang dilaksanakan di bawah Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Pengurusan Refrigeran) 1999
Table 4.3 DOE: Activities Implemented under Compliance to Environmental Quality (Refrigerant Management) Regulations 1999

Sektor Sector	Bilangan Aktiviti / Lawatan Penguatkuasaan Yang Selesai No. of Completed Activities / Enforcement Visit
1. Sektor Servis Penghawa Dingin Kenderaan Mobile Air Conditioning Servicing Sector (MAC)	
Program Pentauliah Juruteknik Servis MAC (CSTP) Certification of MAC Service Technicians Programme (CSTP)	9
Jumlah Peserta Number of Participant	198
2. Sektor Servis Penyejukan Refrigeration Service Sector (RSS)	
Program Pentauliah Juruteknik Servis RSS (CSTP) Certification of RSS Service Technicians Programme(CSTP)	37
Jumlah Peserta Number of Participant	910
3. Lawatan Penguatkuasaan Enforcement Visit	234

Mesyuarat Kesembilan Persidangan Parti Kepada Konvensyen Vienna dan Mesyuarat Parti Ke 22 di Bali, Indonesia, pada 21-25 November 2011
The Ninth Meeting of the Conference of the Parties to the Vienna Convention (COP 9) and The 23rd Meeting of Parties (MOP 23) Bali, Indonesia, 21-25 November 2011

Seminar Perlindungan Lapisan Ozon dan Pengawalan Pemanasan Global Untuk Mengurangkan Bahan Kawalan Protokol Montreal dan Protokol Kyoto, Tokyo Japan
Seminar On Ozone Layer Protection And Global Warming Countermeasures Measure To Reduce The Controlled Substance Of The Montreal Protocol and Kyoto Protocol, Tokyo Japan

KAWALAN TERHADAP PREMIS YANG DITETAPKAN
CONTROL OF PRESCRIBED PREMISES

Kilang Getah Asli Mentah dan Kilang Kelapa Sawit Mentah dikategorikan sebagai premis yang ditetapkan 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 tuan punya premis-premis ini perlu mempunyai lesen daripada Jabatan Alam Sekitar bagi menduduki dan menggunakan premis.

Raw natural rubber factories and crude palm oil processing 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. 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.

Kilang Getah Asli Mentah

Pada tahun 2011, sejumlah 78 buah kilang getah asli mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan)(Getah Asli Mentah), 1978. Daripada jumlah ini, 66 buah kilang telah dilesenkan untuk melepaskan efluen yang telah diolah ke alur air, sebuah kilang telah dilesenkan untuk melepaskan efluen ke atas tanah, manakala 11 buah kilang dibenarkan untuk mengitar semula efluen. Tempoh lesen yang diberikan bagi setiap premis adalah berbeza dari satu hingga tiga tahun bergantung kepada prestasi pematuhan kilang-kilang tersebut terhadap syarat-syarat lesen. **Rajah 4.4** menunjukkan bilangan kilang getah asli mentah mengikut negeri seluruh Malaysia.

Raw Natural Rubber

In 2011, there were 78 raw natural rubber factories licensed under the Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations, 1978. Out of these, 66 factories were licensed to discharge treated effluent into inland watercourse, one (1) was permitted to practise land disposal, while the remaining 11 were allowed to recycle their effluent. The licensing periods of these premises vary from one to three years depending on the level of compliance to the conditions of the licences. **Figure 4.4** shows the distribution of raw natural rubber factories according to states.

Dalam tahun 2011, pegawai-pegawai penguatkuasa Jabatan Alam Sekitar Negeri telah menjalankan sebanyak 279 pemeriksaan ke atas 78 buah kilang getah asli mentah yang telah dilesenkan. Kilang-kilang yang mempunyai rekod pematuhan yang rendah telah diberi keutamaan pemeriksaan. Tindakan susulan pemeriksaan penguatkuasaan yang diambil adalah seperti yang ditunjukkan dalam **Rajah 4.4**.

Throughout 2011, state DOE enforcement officers conducted 279 inspections on 78 licensed raw natural rubber factories. Factories with low compliance record were given priority for inspections. Actions taken as a result of these inspections are as shown in **Figure 4.4**.

Sebanyak 26 surat arahan dan 22 notis arahan telah dikeluarkan kepada premis-premis tersebut supaya mengambil tindakan pembaikan bagi mematuhi keperluan perundangan. Sebanyak dua (2) kompaun telah dikeluarkan bagi kesalahan-kesalahan yang telah dilakukan. Tiga (3) tindakan mahkamah telah diambil bagi kegagalan mematuhi syarat-syarat lesen dengan denda sebanyak RM19,000 telah dikenakan (**Rajah 4.4**).

A total of 26 directive letters and 22 notices were issued to the concerned premises to take corrective actions in order to comply with the legal requirements. Two (2) compounds were issued for the offences committed and three (3) court actions were taken with a total fines of RM19,000 for failure to comply with conditions of the licence (**Figure 4.4**).

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

Pada tahun 2011, pencapaian pematuhan keseluruhan kilang getah asli mentah yang tertakluk di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Getah Asli Mentah) 1978 adalah 100%.

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978

Kilang getah asli mentah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978. Pada tahun 2011, pencapaian pematuhan keseluruhan oleh kilang getah asli mentah adalah 100%.

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

Kilang getah asli mentah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005. Pada tahun 2011, pencapaian pematuhan keseluruhan oleh kilang getah asli mentah adalah 97.5%.

Kilang Kelapa Sawit Mentah

Sejumlah 426 buah kilang kelapa sawit mentah telah dilesenkan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Kelapa Sawit Mentah), 1977 pada tahun 2011. Dari 426 buah kilang yang dilesenkan, sebanyak 283 buah kilang telah dilesenkan untuk melepaskan efluen yang diolah ke dalam alur air, 96 buah kilang melupuskan efluen ke atas tanah, 32 buah kilang melupuskan efluen dengan menggunakan gabungan kaedah alur air dan atas tanah, 12 buah kilang menggunakan kaedah kompos manakala tiga (3) buah kilang menggunakan gabungan kaedah alur air dan kompos. **Rajah 4.5** menunjukkan taburan bilangan kilang kelapa sawit mentah di Malaysia mengikut negeri.

Sepanjang tahun 2011, sejumlah 1,311 pemeriksaan ke atas 426 kilang kelapa sawit yang dilesenkan di seluruh negara telah dilaksanakan oleh pegawai-pegawai penguatkuasa Jabatan Alam Sekitar Negeri. Tindakan susulan pemeriksaan penguatkuasaan tersebut adalah seperti yang ditunjukkan dalam **Rajah 4.5**.

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

In 2011, 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 100%.

Status Of Compliance With The Environmental Quality (Clean Air) Regulations, 1978

Raw natural rubber factories are also subjected to the Environmental Quality (Clean Air) Regulations, 1978. In 2011, overall compliance performance by the raw natural rubber factories was 100%.

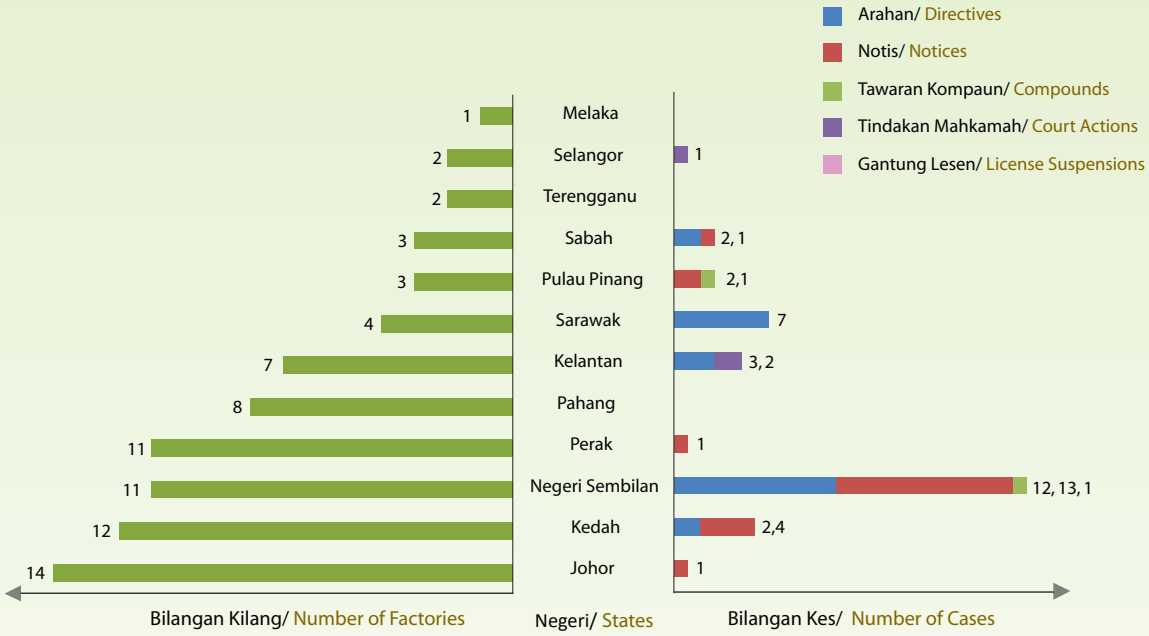
Status Of Compliance With The Environmental Quality (Scheduled Wastes) Regulations, 2005

Raw natural rubber factories are also subjected to the control of the Environmental Quality (Scheduled Wastes) Regulations, 2005. In 2011, overall compliance with performance by the raw natural rubber factories was 97.5%.

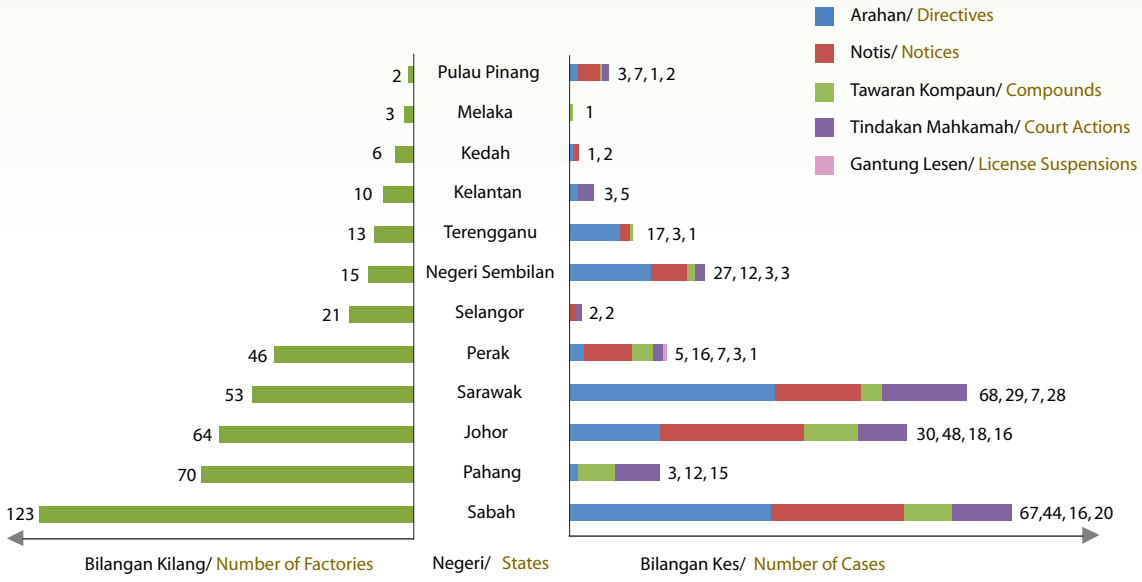
Crude Palm Oil

There were 426 palm oil processing mills licensed under the Environmental Quality (Prescribed Premises) (Crude Palm Oil Mill) Regulations, 1977 in the year 2011. Of these 426 licensed prescribed premises, 283 were granted permission to discharge treated effluent into inland watercourse, 96 to practice land disposal, 32 to discharge effluent into inland watercourse and land disposal, 12 to practice composting and three (3) to discharge treated effluent using a combination of inland watercourse and composting. **Figure 4.5** shows the distribution of palm oil processing mills in Malaysia according to states.

Throughout 2011, a total of 1,311 inspections on 426 licensed palm oil mills were conducted by State DOE enforcement officers. Various actions taken as a result from these inspections are as shown in **Figure 4.5**.



Rajah 4.4 JAS: Tindakan Undang-Undang Terhadap Kilang Getah Asli Mentah, 2011
Figure 4.4 DOE: Legal Actions Against Raw Natural Rubber Factories, 2011



Rajah 4.5 JAS: Tindakan Undang-Undang Terhadap Kilang Minyak Kelapa Sawit Mentah, 2011
Figure 4.5 DOE: Legal Actions Against Crude Palm Oil Mills, 2011

Sebanyak 224 surat arahan dan 163 notis arahan telah dikeluarkan kepada premis-premis tersebut untuk mengambil tindakan bagi mematuhi keperluan perundangan. Sebanyak 66 kompaun dikeluarkan bagi kesalahan yang dilakukan dan 94 tindakan mahkamah telah diambil bagi kegagalan mematuhi syarat-syarat lesen dan denda sebanyak RM1,102,800 telah dikenakan.

A total of 224 directive letters and 163 notices were issued to the mills to comply with the legal requirements. Sixty-six (66) compounds were issued for offences committed and 94 court actions were taken with a total fine of RM1,102,800 for failure to comply with conditions of the licences.

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

Pada tahun 2011, pencapaian pematuhan keseluruhan kilang kelapa sawit mentah yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Premis Yang Ditetapkan) (Minyak Kelapa Sawit Mentah) 1977 adalah 95.5 %.

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

In 2011, the overall compliance achieved by the palm oil processing mills that were subjected to the Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977 was 95.5%.

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978

Kilang kelapa sawit mentah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978. Pada tahun 2011, pencapaian pematuhan keseluruhan oleh kilang minyak kelapa sawit mentah adalah 99.5%.

Status Of Compliance With The Environmental Quality (Clean Air) Regulations, 1978

Palm oil processing mills are also subjected to the control of the Environmental Quality (Clean Air) Regulations, 1978. In 2011, the overall compliance performance by palm oil processing mills was 99.5%.

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

Kilang kelapa sawit mentah adalah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005. Pada tahun 2011 pencapaian pematuhan keseluruhan oleh premis yang ditetapkan adalah 100%.

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

Palm oil processing mills are also subjected to the control of the Environmental Quality (Scheduled Wastes) Regulations, 2005. In 2011, the overall compliance performance by the palm oil processing mills was 100%.

KAWALAN TERHADAP PREMIS YANG BUKAN DITETAPKAN
CONTROL OF NON-PRESCRIBED PREMISES

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 2011, Jabatan Alam Sekitar (JAS) telah menjalankan 10,173 pemeriksaan penguatkuasaan terhadap sejumlah 38 kategori industri pembuatan dan premis-premis yang bukan ditetapkan lain yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009. Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 99.8 %, dimana sebanyak 15 kategori industri mencapai pematuhan 100%, pada tahun ini (**Rajah 4.6**).

Status Pematuhan Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978

Premis-premis yang bukan ditetapkan adalah juga tertakluk kepada kawalan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978. Pada tahun 2011, JAS telah menjalankan 10,173 pemeriksaan penguatkuasaan terhadap sejumlah 38 kategori industri pembuatan dan premis-premis yang bukan ditetapkan lain yang tertakluk kepada Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978. Pencapaian pematuhan keseluruhan oleh premis yang bukan ditetapkan adalah 99.6%.

Pada tahun ini, 11 kategori industri mencapai pematuhan 100% terhadap Peraturan ini. (**Rajah 4.7**).

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. Pada tahun 2011, JAS telah menjalankan 10,173 pemeriksaan penguatkuasaan terhadap sejumlah 38 kategori industri pembuatan dan premis-premis yang bukan ditetapkan lain. Pencapaian pematuhan

Status of Compliance with the Environmental Quality (Industrial Effluents) Regulations, 2009

Non-prescribed premises that discharge effluents are subjected to the Environmental Quality (Industrial Effluents) Regulations, 2009. In 2011, DOE conducted 10,173 inspections on 38 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 99.8%, and 15 categories of industries achieved 100% compliance in 2011 (**Figure 4.6**).

Status of Compliance with the Environmental Quality (Clean Air) Regulations, 1978

Non-prescribed premises are also subjected to the Environmental Quality (Clean Air) Regulations, 1978. In 2011, DOE conducted 10,173 inspections on 38 categories of industrial premises and other non-prescribed premises that were subjected to the Environmental Quality (Clean Air) Regulations, 1978. The overall compliance by the non-prescribed premises was 99.6%.

In 2011, 11 categories of industries that were subjected to the Environmental Quality (Clean Air) Regulations, 1978 achieved 100% compliance. (**Figure 4.7**).

Status of Compliance with the Environmental Quality (Scheduled Wastes) Regulations, 2005

Non-prescribed premises are also subjected to the Environmental Quality (Scheduled Wastes) Regulations, 2005. In 2011, the DOE conducted 10,173 inspections on 38 categories of industrial premises and other non-prescribed premises. The overall compliance achieved by the non-prescribed premises was 99.2%. Among the non-compliances recorded include failure to

keseluruhan oleh premis yang bukan ditetapkan adalah 99.2%. Antara kegagalan pematuhan yang direkodkan adalah: tidak mengemukakan pemberitahuan mengenai pengeluaran buangan terjadual kepada JAS, buangan terjadual tidak distor dengan baik, buangan terjadual tidak dilabel dengan sempurna dan tiada menyimpan inventori buangan terjadual (Peraturan 3, 8, 9, 10 dan 11).

Pada tahun ini juga, 12 kategori industri mencapai pematuhan 100% terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 (**Rajah 4.8**).

TINDAKAN PENGUATKUASAAN

Sebanyak 179 kes premis yang tidak patuh telah dituduh di mahkamah. Sejumlah RM2,166,800 denda telah dikenakan. Tindakan-tindakan penguatkuasaan lain yang diambil adalah pengeluaran 2,123 surat arahan dan 1,164 notis arahan kepada industri supaya mereka 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) 1978 dan Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005.

Bagi meningkatkan pematuhan, JAS telah mengeluarkan arahan-arahan kepada pihak 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. Di samping itu, 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.

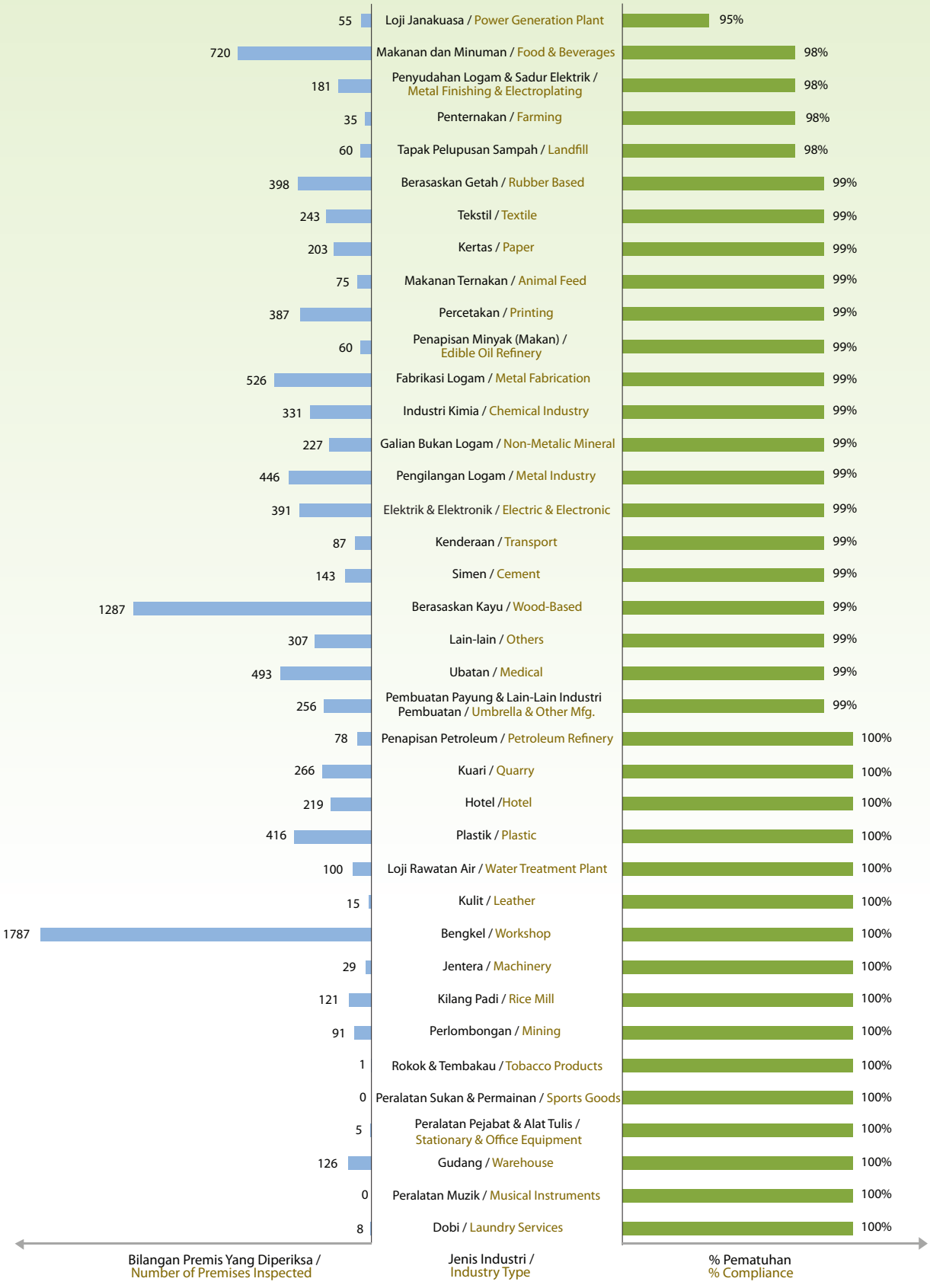
submit notifications of scheduled wastes generation to DOE, improper storage and improper labelling of scheduled wastes, and failure to keep accurate and up-to-date inventory of scheduled wastes (Regulations 3, 8, 9, 10 and 11).

In 2011, 12 categories of industries that were subjected to the Environmental Quality (Scheduled Wastes) Regulations, 2005 achieved 100% compliance (**Figure 4.8**).

ENFORCEMENT ACTIONS

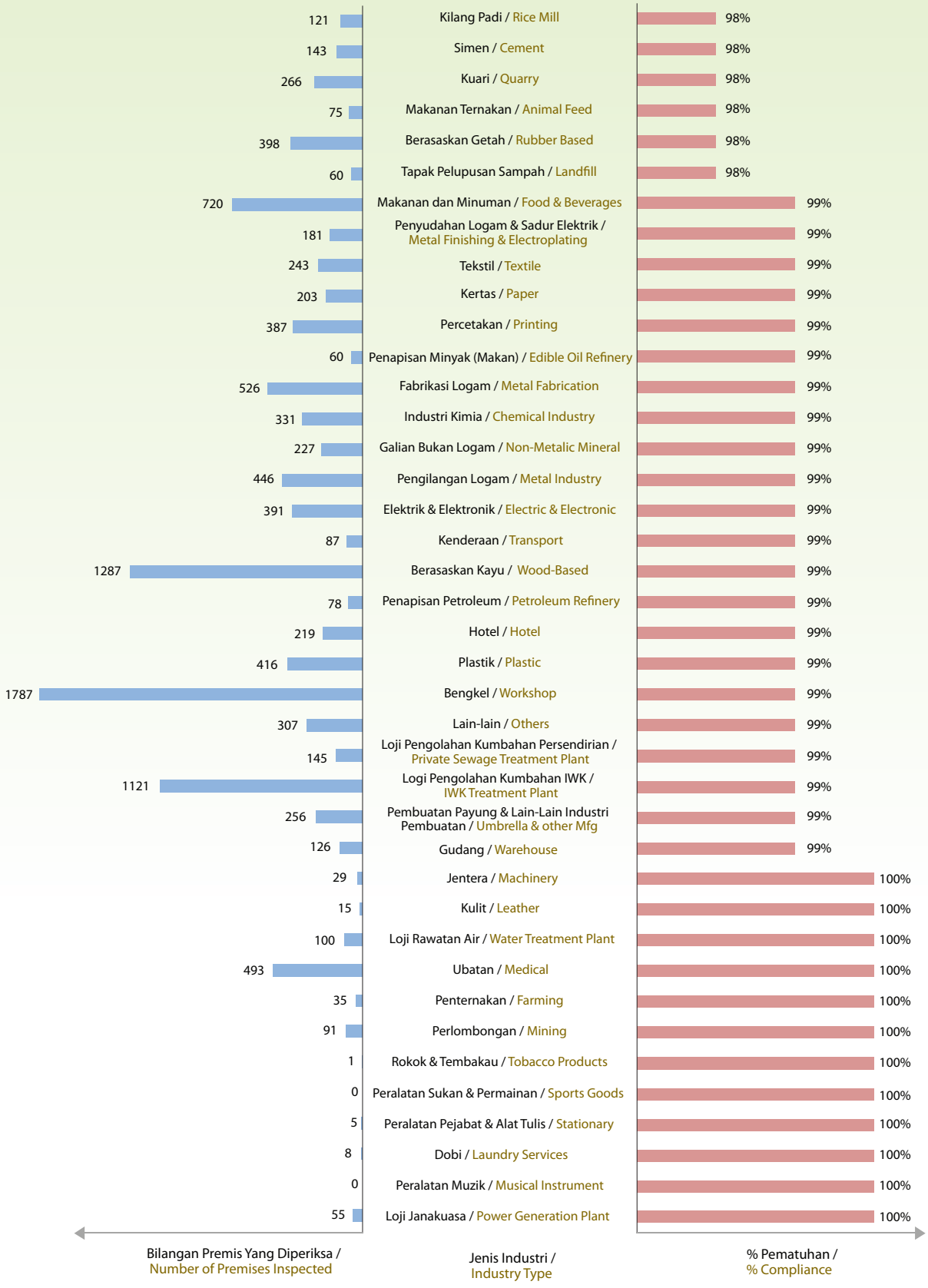
A total of 179 cases of non-compliances were charged in courts. A total fine of RM2,166,800 were collected. Other enforcement actions taken against the non-complying industries were issuance of 2,123 written directives and 1,164 notices for them to take appropriate actions in order to comply with the Environmental Quality Act, 1974 and the Environmental Quality (Industrial Effluents) Regulations, 2009, Environmental Quality (Clean Air) Regulations, 1978 and Environmental Quality (Scheduled Wastes) Regulations, 2005.

In order to improve compliance, DOE 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.



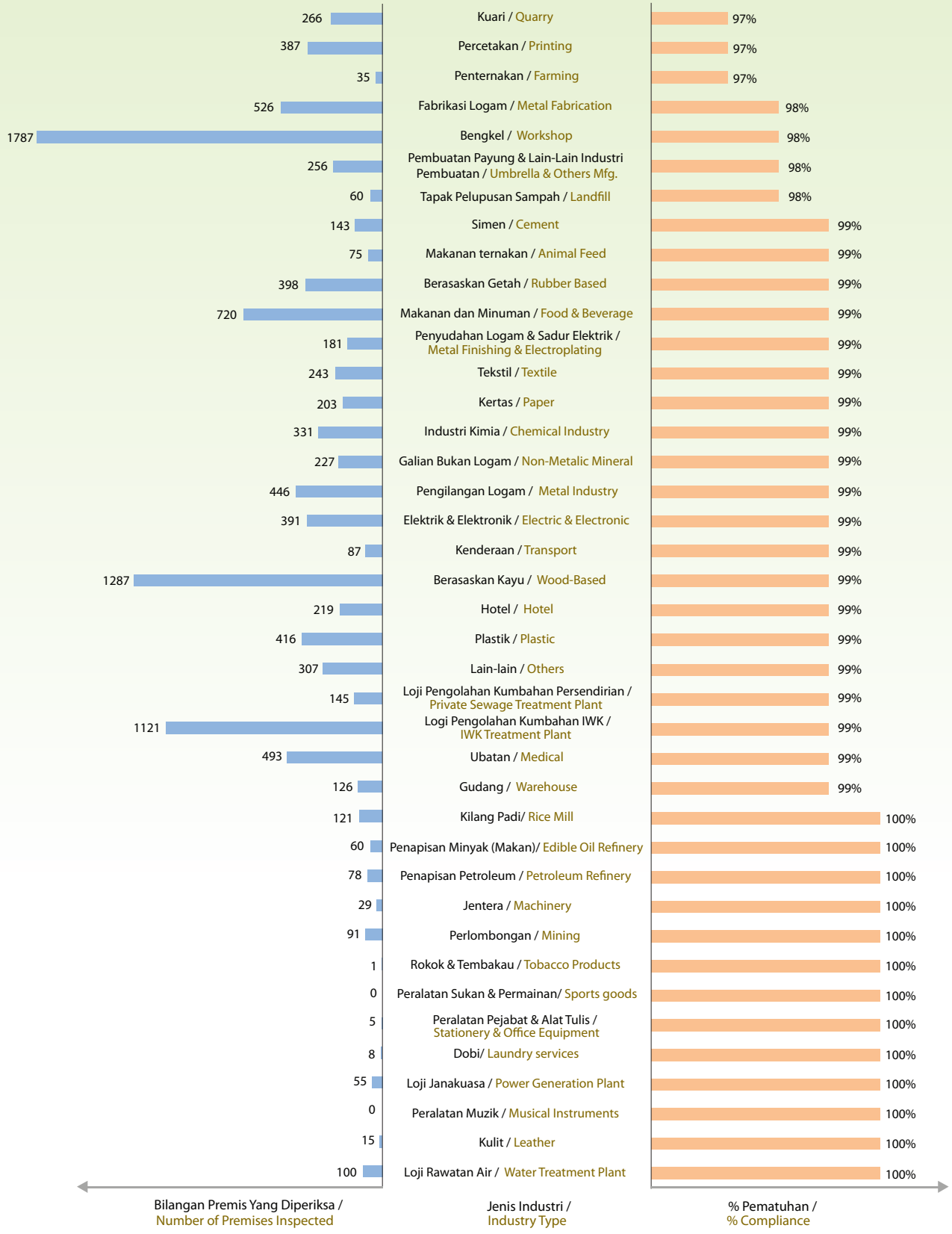
Rajah 4. 6 JAS: Status Pematuhan Industri Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009, 2011

Figure 4.6 DOE: Compliance Status to the Environmental Quality (Industrial Effluent) Regulations 2009, 2011



Rajah 4.7 JAS: Status Pematuhan Industri Terhadap Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978, 2011

Figure 4.7 DOE: Compliance Status to the Environmental Quality (Clean Air) Regulations 1978, 2011



Rajah 4.8 JAS: Status Pematuhan Industri Terhadap Peraturan- Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005, 2011

Figure 4.8 DOE: Compliance Status to the Environmental Quality (Scheduled Wastes) Regulations 2005, 2011

PENGAWASAN KUALITI AIR MARIN KEBANGSAAN
MARINE WATER QUALITY MONITORING

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

Objektif utama pengawasan marin ini dijalankan adalah bertujuan untuk memantau dan memelihara kualiti air marin daripada pembangunan sekelilingnya.

Rangkaian Stesen-Stesen Pengawasan Kualiti Air Marin

Dalam tahun 2011, terdapat 246 stesen pengawasan di seluruh Malaysia (**Rujuk Peta 4.3** dan **4.4**); Perlis (2 stesen), Kedah (3 stesen), Pulau Langkawi (7 stesen), Pulau Pinang (22 stesen), Perak (11 stesen), Selangor (14 stesen), Negeri Sembilan (13 stesen), Melaka (11 stesen), Johor (54 stesen), Pahang (20 stesen), Terengganu (20 stesen), Kelantan (10 stesen), Sabah (26 stesen), W.P Labuan (5 stesen) dan Sarawak (28 stesen) (**Jadual 4.4**). Dua (2) stesen baru telah dibuka pada tahun 2011 (**Jadual 4.5**) bagi mengembangkan rangkaian pengawasan stesen marin di Malaysia.

Parameter dan Peralatan Persampelan

Pengukuran parameter-parameter fizikal kualiti air marin dibuat secara *in-situ* seperti suhu, pH, konduktiviti, kemasinan, oksigen terlarut dan kekeruhan manakala 14 parameter yang dianalisis di makmal pula adalah jumlah pepejal terampai, *Escherichia coli*, nitrat, fosfat, jumlah karbon organik, minyak dan gris termasuk logam berat seperti Merkuri (Hg), Kadmium (Cd), Kromium (Cr), Kuprum (Cu), Plumbum (Pb), Arsenik (As), Tributiltin (TBT) dan Trifeniltin (TPT).

Bagi tujuan pengukuran di lapangan, alat pengukuran seperti *Multiprobe Sonde* digunakan bagi merekod bacaan *in-situ*. Bagi analisis kimia di makmal, air

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

The main objective of the marine water quality monitoring is to monitor and protect the quality of marine water from surrounding development.

Marine Water Quality Stations Network

In 2011, a total of 246 monitoring stations were set up throughout Malaysia (**Refer Map 4.3** and **4.4**); Perlis (2 stations), Kedah (3 stations), Pulau Langkawi (7 stations), Pulau Pinang (22 stations), Perak (11 stations), Selangor (14 stations), Negeri Sembilan (13 stations), Melaka (11 stations), Johor (54 stations), Pahang (20 stations), Terengganu (20 stations), Kelantan (10 stations), Sabah (26 stations), W.P Labuan (5 stations) and Sarawak (28 stations) (**Table 4.4**). Two (2) monitoring stations were opened in 2011 (**Table 4.5**) to extend the monitoring network marine stations in Malaysia.

Sampling Parameters and Equipments

Marine water quality monitoring includes measurement of in-situ parameters such as temperature, pH, conductivity, salinity, dissolved oxygen, turbidity while laboratory analysis involves 14 other parameters such as total suspended solids, *Escherichia coli*, nitrate, phosphate, total organic carbon, oil and grease, and heavy metals like Mercury (Hg), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Arsenic (As), Tributyltin (TBT) and Triphenyltin.

For in-situ measurement, equipment such as the Multiprobe Sonde was used. For chemical analysis in the laboratory, water samples were collected using a

sampel akan diambil dengan menggunakan alat *Van Dorn Sampler* bersaiz 3 hingga 4 liter dan diisikan ke dalam botol sampel yang telah diisikan dengan agen pengawet.

Program Audit Pengawasan Marin

Program Audit Pengawasan Marin terhadap kakitangan JAS Negeri yang terlibat dengan aktiviti pengawasan marin telah diadakan bagi memastikan kaedah persampelan yang telah dijalankan adalah sama sepertimana yang dinyatakan di dalam Prosedur Operasi Tetap (SOP) Pengawasan Marin. Program Audit ini adalah penting bagi memastikan data-data yang diperolehi boleh digunapakai. (**Jadual 4.7**)

Kajian Pembentukan Indeks Kualiti Air Marin (IKAM)

JAS melalui Bahagian Air dan Marin telah melantik Malaysian Environmental Resources Centre Sdn. Bhd. (MERC) sebagai perunding untuk menjalankan kajian bagi membangunkan Indeks Kualiti Air Marin (IKAM). Dengan adanya indeks ini, keseluruhan kualiti air perairan di Malaysia boleh dikelaskan sama ada ianya bersih, sederhana tercemar ataupun tercemar. Indeks ini dijangka dapat digunapakai sepenuhnya pada tahun 2013.

Malaysia-Singapore Joint Committee on the Environment (MSJCE) Working Group

Sebagai tambahan di bawah Program Pengawasan Selat Johor di bawah 'Malaysia-Singapore Joint Committee on the Environment' (MSJCE) Working Group, 20 stesen telah dipantau pada tahun 2011 (**Jadual 4.6**)

3-4 liters Van Dorn Sampler and filled into a sample bottle containing preservative agent.

Marine Surveillance Audit Program

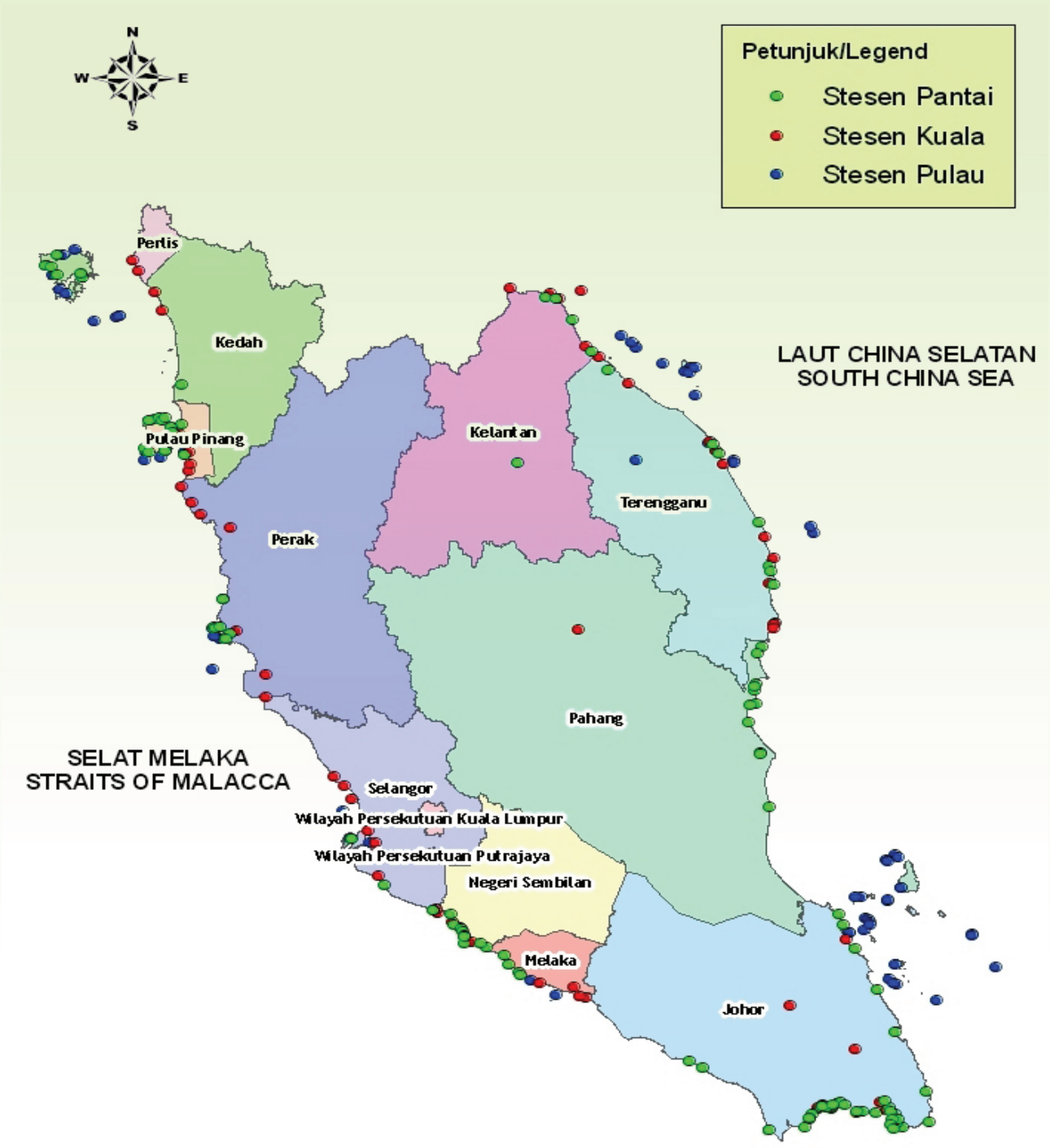
The Marine Surveillance Audit Program was conducted at the DOE's State Offices together with officers conducting marine monitoring activity to ensure that all sampling procedures carried out complied with the Standard Operating Procedures (SOP) for Marine Monitoring. This audit program is essential to ensure that the data obtained are reliable. (**Table 4.7**)

Study on Development of Marine Water Quality Index (IKAM)

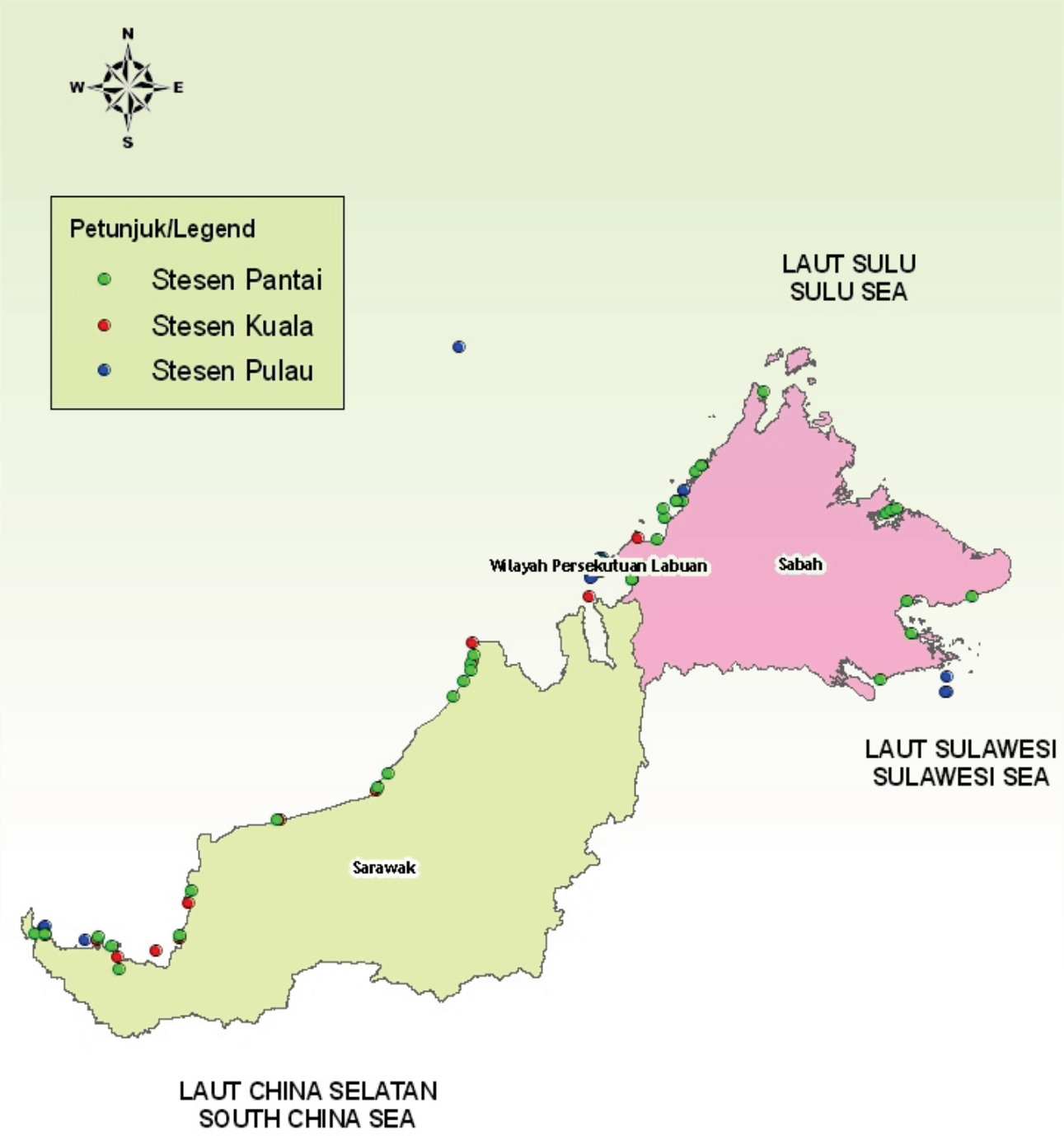
DOE through the Marine and Water Division appointed Malaysian Environmental Resources Centre Sdn. Bhd. (MERC) as consultant to conduct a study to develop the Marine Water Quality Index (IKAM). With this index, the overall marine water quality in Malaysia can be classified as clean, slightly polluted or polluted. This index is expected to be completed in 2013.

Malaysia-Singapore Joint Committee on the Environment (MSJCE) Working Group

In addition, under the Malaysia-Singapore Joint Committee on the Environment (MSJCE) Working Group Monitoring Programme, 20 stations were monitored in 2011 (**Table 4.6**).



Peta 4.3 Semenanjung Malaysia: Lokasi Pengawasan Marin, 2011
Map 4.3 Peninsular Malaysia: Marine Monitoring Locations, 2011



Peta 4.4 Sabah & Sarawak: Lokasi Pengawasan Marin, 2011
Map 4.4 Sabah & Sarawak: Marine Monitoring Locations, 2011

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2011
Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2011

Bil./ No.	Negeri / State	Kawasan / Area	Nama Stesen / Station Name	No. Stesen / Station No.	Longitude / Longitude	Latitude / Latitude
1	PERLIS	KUALA/ESTUARINE	KUALA SG. BARU	6302903	N 06° 19' 54.5"	E 100° 09' 20.0"
2	PERLIS	KUALA/ESTUARINE	KUALA SG. PERLIS	6401901	N 06° 23' 59.0"	E 100° 07' 34.8"
1	KEDAH	KUALA/ESTUARINE	KUALA SG. KEDAH	6102908	N 06° 06' 13.0"	E 100° 16' 32.0"
2	KEDAH	KUALA/ESTUARINE	KUALA JERLUN	6302925	N 06° 12' 36.0"	E 100° 14' 20.9"
3	KEDAH	PANTAI/COASTAL	PANTAI MERDEKA	5603905	N 05° 40' 10.0"	E 100° 22' 40.0"
1	P.LANGKAWI	PANTAI/COASTAL	LANGKAWI ISLAND RESORT	6399914	N 06° 17' 51.1"	E 099° 51' 38.3"
2	P.LANGKAWI	PANTAI/COASTAL	PANTAI KOK	6397922	N 06° 22' 12.0"	E 099° 40' 43.7"
3	P.LANGKAWI	PANTAI/COASTAL	PANTAI KUAH	6398913	N 06° 19' 04.1"	E 099° 51' 04.5"
4	P.LANGKAWI	PANTAI/COASTAL	PANTAI PASIR TENGKORAK	6497901	N 06° 25' 46.3"	E 099° 43' 37.1"
5	P.LANGKAWI	PANTAI/COASTAL	PANTAI TELUK BURAU	6396923	N 06° 21' 52.4"	E 099° 40' 13.7"
6	P.LANGKAWI	PANTAI/COASTAL	PANTAI TELUK NIBUNG	6497915	N 06° 21' 38.9"	E 099° 42' 08.1"
7	P.LANGKAWI	PANTAI/COASTAL	PANTAI TENGAH	6297903	N 06° 18' 52.4"	E 099° 43' 46.8"
1	PULAU PINANG	KUALA/ESTUARINE	KUALA SG. JAWI	5204901	N 05° 16' 50.0"	E 100° 25' 00.0"
2	PULAU PINANG	KUALA/ESTUARINE	KUALA SG. JURU	5304904	N 05° 20' 20.0"	E 100° 24' 20.0"
3	PULAU PINANG	KUALA/ESTUARINE	KUALA SG. KERIAN	5104901	N 05° 10' 00.0"	E 100° 25' 00.0"
4	PULAU PINANG	KUALA/ESTUARINE	KUALA SG. PINANG	5403934	N 05° 24' 00.0"	E 100° 20' 05.0"
5	PULAU PINANG	KUALA/ESTUARINE	KUALA SG. PERAI	5303908	N 05° 23' 00.0"	E 100° 22' 00.0"
6	PULAU PINANG	PANTAI/COASTAL	BATU FERINGGI (CASUARINA)	5402904	N 05° 28' 10.0"	E 100° 14' 30.0"
7	PULAU PINANG	PANTAI/COASTAL	KAW. PER. BAYAN LEPAS I	5303932	N 05° 20' 00.0"	E 100° 18' 45.0"
8	PULAU PINANG	PANTAI/COASTAL	KAW. PER. BAYAN LEPAS II	5303933	N 05° 19' 00.0"	E 100° 18' 30.0"
9	PULAU PINANG	PANTAI/COASTAL	KAW. PER. BAYAN LEPAS III	5302939	N 05° 18' 20.0"	E 100° 17' 45.0"
10	PULAU PINANG	PANTAI/COASTAL	LUAR PANTAI TELUK BAHANG	5402930	N 05° 27' 45.0"	E 100° 12' 45.0"
11	PULAU PINANG	PANTAI/COASTAL	PANTAI BERSIH	5403906	N 05° 26' 30.0"	E 100° 22' 40.0"
12	PULAU PINANG	PANTAI/COASTAL	PANTAI MIAMI	5502901	N 05° 28' 30.0"	E 100° 16' 00.0"
13	PULAU PINANG	PANTAI/COASTAL	PANTAI PASIR PANJANG	5201938	N 05° 17' 50.0"	E 100° 11' 00.0"
14	PULAU PINANG	PANTAI/COASTAL	PERSIARAN GURNEY	5403902	N 05° 25' 30.0"	E 100° 19' 30.0"
15	PULAU PINANG	PANTAI/COASTAL	RUMAH PAM BARU PERAI	5304927	N 05° 21' 15.0"	E 100° 23' 15.0"
16	PULAU PINANG	PANTAI/COASTAL	RUMAH PAM LAMA PERAI	5303926	N 05° 20' 00.0"	E 100° 18' 45.0"
17	PULAU PINANG	PANTAI/COASTAL	SELAT PP SELATAN (JELUTONG)	5303911	N 05° 23' 30.0"	E 100° 19' 50.0"
18	PULAU PINANG	PANTAI/COASTAL	TANJUNG BUNGAH	5402937	N 05° 28' 00.0"	E 100° 16' 50.0"
19	PULAU PINANG	PANTAI/COASTAL	GERTAK SANGGUL	5201919	N 05° 16' 50.0"	E 100° 12' 40.0"
20	PULAU PINANG	PANTAI/COASTAL	TELUK TEMPOYAK	5202923	N 05° 28' 30.0"	E 100° 17' 30.0"
21	PULAU PINANG	KUALA/ESTUARINE	KUALA SUNGAI TENGAH	5104901	N 05° 12' 41.0"	E 100° 25' 29.0"
22	PULAU PINANG	KUALA/ESTUARINE	KUALA SUNGAI PINANG	403934	N 05° 24' 13.0"	E 100° 19' 54.0"
1	PERAK	KUALA/ESTUARINE	KUALA SG. MANJUNG	4205930	N 04° 14' 09.0"	E 100° 39' 57.0"
2	PERAK	KUALA/ESTUARINE	KUALA SG. TG. PIANDANG	5003921	N 05° 04' 27.0"	E 100° 22' 34.0"
3	PERAK	KUALA/ESTUARINE	KUALA SG. GULA	4906926	N 04° 55' 07.0"	E 100° 28' 57.0"
4	PERAK	KUALA/ESTUARINE	KUALA SG. KURAU	4994919	N 04° 59' 13.0"	E 100° 25' 46.0"
5	PERAK	KUALA/ESTUARINE	KUALA SG. PERAK	4007901	N 03° 59' 03.0"	E 100° 48' 58.0"
6	PERAK	KUALA/ESTUARINE	KUALA SG. SEPETANG	4806925	N 04° 50' 07.0"	E 100° 37' 57.0"
7	PERAK	PANTAI/COASTAL	PANTAI PASIR BOGAK	4205908	N 04° 12' 58.0"	E 100° 37' 55.0"
8	PERAK	PANTAI/COASTAL	PANTAI PASIR PANJANG	4305924	N 04° 25' 07.0"	E 100° 35' 35.0"
9	PERAK	PANTAI/COASTAL	PANTAI TANJUNG BATU	4406927	N 04° 25' 07"	E 100° 35' 35"
10	PERAK	PANTAI/COASTAL	PANTAI TELUK BATIK	4205923	N 04° 11' 14.0"	E 100° 36' 33.0"
11	PERAK	PANTAI/COASTAL	PANTAI TELUK DALAM	4205928	N 04° 14' 53.0"	E 100° 33' 25.0"
1	SELANGOR	PANTAI/COASTAL	PANTAI BAGAN LALANG	2616927	N 02° 36' 20.0"	E 101° 41' 30.0"
2	SELANGOR	PANTAI/COASTAL	PANTAI MORIB	2712902	N 02° 45' 00.0"	E 101° 26' 20.0"
3	SELANGOR	PANTAI/COASTAL	SELAT PULAU BABI	3012929	N 03° 01' 10.0"	E 101° 15' 55.0"
4	SELANGOR	KUALA/ESTUARINE	SELAT KLANG UTARA	3013908	N 03° 04' 00.0"	E 101° 21' 00.0"
5	SELANGOR	KUALA/ESTUARINE	KUALA SG. SEPANG	2517922	N 02° 35' 35.0"	E 101° 42' 56.0"
6	SELANGOR	KUALA/ESTUARINE	KUALA SG. SEPANG (KECIL)	2612928	N 02° 36' 40.0"	E 101° 42' 15.0"

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2011 (sambungan)
Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2011 (continued)

Bil./ No.	Negeri / State	Kawasan / Area	Nama Stesen / Station Name	No. Stesen / Station No.	Longitude / Longitude	Latitude / Latitude
7	SELANGOR	KUALA/ESTUARINE	KUALA SG. SEPANG (KAWALAN)	2616926	N 02° 36' 20.0"	E 101° 41' 30.0"
8	SELANGOR	KUALA/ESTUARINE	KUALA SUNGAI KLANG	3013909	N 03° 00' 06.0"	E 101° 23' 24.0"
9	SELANGOR	KUALA/ESTUARINE	KUALA SUNGAI LANGAT (JUGRA)	2814925	N 02° 48' 25.0"	E 101° 24' 15.0"
10	SELANGOR	KUALA/ESTUARINE	KUALA SUNGAI LANGAT (LUMUT)	2913903	N 02° 55' 50.0"	E 101° 21' 15.0"
11	SELANGOR	KUALA/ESTUARINE	KUALA SUNGAI BULOH	3212930	N 03° 15' 10.0"	E 101° 15' 50.0"
12	SELANGOR	KUALA/ESTUARINE	KUALA SUNGAI SELANGOR	3312915	N 03° 20' 00.0"	E 101° 13' 30.0"
13	SELANGOR	KUALA/ESTUARINE	KUALA SUNGAI TENGI	3311931	N 03° 23' 00.0"	E 101° 10' 20.0"
14	SELANGOR	KUALA/ESTUARINE	KUALA SUNGAI BERNAM	3808924	N 03° 51' 00.0"	E 100° 49' 00.0"
1	N. SEMBILAN	KUALA/ESTUARINE	KUALA SUNGAI LINGGI	2319901	N 02° 23' 20.0"	E 101° 58' 19.0"
2	N. SEMBILAN	KUALA/ESTUARINE	KUALA SUNGAI LUKUT	2517910	N 02° 34' 45.0"	E 101° 47' 16.0"
3	N. SEMBILAN	PANTAI/COASTAL	PANTAI BAGAN PINANG	2418915	N 02° 30' 31.0"	E 101° 49' 44.0"
4	N. SEMBILAN	PANTAI/COASTAL	PANTAI TELUK SINTING PASIR PANJANG	2419908	N 02° 24' 57.0"	E 101° 56' 31.0"
5	N. SEMBILAN	PANTAI/COASTAL	PORT DICKSON BANDAR	2517907	N 02° 31' 16.0"	E 101° 47' 51.0"
6	N. SEMBILAN	PANTAI/COASTAL	PANTAI PORT DICKSON BATU 10	2418914	N 02° 24' 58.0"	E 101° 51' 23.0"
7	N. SEMBILAN	PANTAI/COASTAL	PANTAI PORT DICKSON BATU 5	2418906	N 02° 29' 46.0"	E 101° 50' 15.0"
8	N. SEMBILAN	PANTAI/COASTAL	PANTAI PORT DICKSON BATU 6	2418916	N 02° 29' 05.0"	E 101° 50' 46.0"
9	N. SEMBILAN	PANTAI/COASTAL	PANTAI PORT DICKSON BATU 7	2418905	N 02° 27' 43.0"	E 101° 51' 04.0"
10	N. SEMBILAN	PANTAI/COASTAL	PANTAI PORT DICKSON BATU 8	2418912	N 02° 27' 16.0"	E 101° 51' 20.0"
11	N. SEMBILAN	PANTAI/COASTAL	PANTAI CERMIN	2416918	N 02° 24' 54.0"	E 101° 51' 38.4"
12	N. SEMBILAN	PANTAI/COASTAL	PORT DICKSON TNB	2517909	N 02° 32' 09.0"	E 101° 47' 42.0"
13	N. SEMBILAN	PANTAI/COASTAL	PANTAI TG. PELANDOK	2419917	N 02° 25' 03.0"	E 101° 53' 34.0"
1	MELAKA	KUALA/ESTUARINE	KUALA SG. KESANG	2186905	N 02° 05' 43.0"	E 102° 29' 12.0"
2	MELAKA	KUALA/ESTUARINE	KUALA SG. MELAKA	2122903	N 02° 11' 06.0"	E 102° 14' 52.0"
3	MELAKA	KUALA/ESTUARINE	KUALA SG. SRI MELAKA	2121914	N 02° 11' 16.4"	E 102° 14' 39.2"
4	MELAKA	KUALA/ESTUARINE	KUALA SG. MERLIMAU	2124912	N 02° 09' 25.0"	E 102° 25' 28.0"
5	MELAKA	KUALA/ESTUARINE	KUALA SG. SEBATU	2186904	N 02° 06' 06.0"	E 102° 27' 35"
6	MELAKA	PANTAI/COASTAL	PANTAI KUNDOR TG. KELING	2221908	N 02° 14' 37.0"	E 102° 08' 29.0"
7	MELAKA	PANTAI/COASTAL	PANTAI ROMBANG TG. KELING	2221906	N 02° 13' 35.0"	E 102° 08' 57.0"
8	MELAKA	PANTAI/COASTAL	PANTAI TG. BIDARA	2320909	N 02° 17' 30.0"	E 102° 05' 18"
9	MELAKA	PANTAI/COASTAL	PANTAI TELUK GONG, PENGKALAN BALAK	2320902	N 02° 20' 23.0"	E 102° 03' 30.0"
10	MELAKA	PANTAI/COASTAL	PULAU MELAKA POINT A	2121915	N 02°10.44.5'	E 102o 14.59.3'
11	MELAKA	PANTAI/COASTAL	PULAU MELAKA POINT B	2121916	N 02°10.39.5'	E 102o 15.22.4'
1	JOHOR	PANTAI/COASTAL	KG. TANJUNG KOPOK	SJ1	N 01° 25' 31.0"	E 104° 00' 03"
2	JOHOR	PANTAI/COASTAL	KG. PASIR PUTIH	SJ2	N 01° 25' 48.0"	E 103° 55' 40.0"
3	JOHOR	PANTAI/COASTAL	J/K SULTAN ISKANDAR	SJ3	N 01° 26' 49.0"	E 103° 46' 09.0"
4	JOHOR	PANTAI/COASTAL	KG. SENIBUNG	SJ4	N 01° 29' 01.0"	E 103° 48' 47.0"
5	JOHOR	KUALA/ESTUARINE	KUALA SG. TEBRAU	SJ4A	N 01° 28' 56.0"	E 103° 47' 48.0"
6	JOHOR	PANTAI/COASTAL	TANJUNG PUTRI	SJ5	N 01° 27' 20.0"	E 103° 46' 09.0"
7	JOHOR	PANTAI/COASTAL	HADAPAN MPJB	SJ6	N 01° 27' 08.0"	E 103° 45' 43.0"
8	JOHOR	PANTAI/COASTAL	TANJUNG DANGA	SJ7	N 01° 27' 24.0"	E 103° 42' 52.0"
9	JOHOR	KUALA/ESTUARINE	KUALA SG. SKUDAI	SJ7A	N 01° 27' 46.0"	E 103° 43' 22.0"
10	JOHOR	PANTAI/COASTAL	HADAPAN PUSAT ISLAM	SJ7B	N 01° 27' 19.0"	E 103° 44' 51.0"
11	JOHOR	PANTAI/COASTAL	TEBING RUNTUH	SJ8	N 01° 25' 10.0"	E 103° 40' 06.0"
12	JOHOR	KUALA/ESTUARINE	KUALA SG. MELAYU	SJ8A	N 01° 26' 53.0"	E 103° 41' 53.0"
13	JOHOR	PANTAI/COASTAL	TANJUNG BUNGA	SJ9	N 01° 23' 07.0"	E 103° 39' 02.0"
14	JOHOR	PANTAI/COASTAL	TANJUNG KUPANG	SJ10	N 01° 23' 36.0"	E 103° 39' 11.0"
15	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI BATU PAHAT	1729930	N 01° 47' 44.0"	E 102° 53' 22.0"
16	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI JOHOR	1440916	N 01° 29' 04.0"	E 104° 01' 22.0"
17	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI MELAYU	1437946	N 01° 27' 15.0"	E 103° 41' 56.0"
18	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI MERSING	2438905	N 02° 26' 10.0"	E 103° 50' 35.0"

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2011 (sambungan)
Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2011 (continued)

Bil./ No.	Negeri / State	Kawasan / Area	Nama Stesen / Station Name	No. Stesen / Station No.	Longitude / Longitude	Latitude / Latitude
19	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI MUAR	2024932	N 02° 02' 54.0"	E 102° 33' 11.0"
20	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI SEGGET	1437919	N 01° 27' 21.0"	E 103° 45' 58.0"
21	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI SKUDAI	1437922	N 01° 28' 28.0"	E 103° 43' 12.0"
22	JOHOR	KUALA/ESTUARINE	KUALA SUNGAI TEBRAU	1438943	N 01° 28' 56.0"	E 103° 47' 48.0"
23	JOHOR	PANTAI/COASTAL	HADAPAN HSAJB	1437920	N 01° 27' 19.0"	E 103° 44' 44.0"
24	JOHOR	PANTAI/COASTAL	JETI TANJONG BELUNGKOR	1440963	N 01° 27' 14.0"	E 104° 04' 03.0"
25	JOHOR	PANTAI/COASTAL	KG. TELUK JAWA	1438918	N 01° 28' 17.0"	E 103° 50' 30.0"
26	JOHOR	PANTAI/COASTAL	PANTAI AIR PAPAN	2538959	N 02° 31' 05.0"	E 103° 50' 00.0"
27	JOHOR	PANTAI/COASTAL	PANTAI DESARU	1542914	N 01° 32' 48.0"	E 104° 15' 41.0"
28	JOHOR	PANTAI/COASTAL	LUAR KUKUP	1334925	N 01° 19' 30.0"	E 103° 26' 29.0"
29	JOHOR	PANTAI/COASTAL	PANTAI LIDO	1437921	N 01° 27' 56.0"	E 103° 43' 29.0"
30	JOHOR	PANTAI/COASTAL	PANTAI SRI PANTAI	2339960	N 02° 22' 45.0"	E 103° 53' 19.0"
31	JOHOR	PANTAI/COASTAL	PANTAI STULANG LAUT	1437951	N 01° 28' 02.0"	E 103° 46' 46.0"
32	JOHOR	PANTAI/COASTAL	PANTAI SUNGAI LURUS	1730962	N 01° 43' 42.0"	E 103° 01' 43.0"
33	JOHOR	PANTAI/COASTAL	PANTAI TANJONG SETAPA	1341961	N 01° 20' 33.0"	E 104° 08' 09.0"
34	JOHOR	PANTAI/COASTAL	PANTAI TELUK GOREK	2538958	N 02° 34' 57.0"	E 103° 48' 18.0"
35	JOHOR	PANTAI/COASTAL	PANTAI TELUK MAHKOTA	1841911	N 01° 53' 52.0"	E 104° 06' 15.0"
36	JOHOR	PANTAI/COASTAL	PANTAI TG.LEMAN	2140694	N 02° 08' 43.0"	E 104° 00' 24.0"
37	JOHOR	PANTAI/COASTAL	PASIR GOGOK	1441966	N 01° 25' 02.8'	E 104° 05' 59.7'
38	JOHOR	PANTAI/COASTAL	PEL. PASIR GUDANG	1428939	N 01° 25' 44.0"	E 103° 54' 03.0"
39	JOHOR	PANTAI/COASTAL	TANJUNG BUAI	1340973	N 01° 29' 48.1"	E 104° 02' 43.4"
40	JOHOR	PANTAI/COASTAL	TANJUNG MERAK	1441968	N 01° 21' 45.9'	E 104° 06' 35.5"
41	JOHOR	PANTAI/COASTAL	TANJUNG PENGELIH	1441967	N 01° 22 14.7'	E 104° 05' 19.5"
42	JOHOR	PANTAI/COASTAL	TANJUNG PENYUSUP	1444920	N 01° 22' 12.9"	E 104° 16' 48.3"
43	JOHOR	PANTAI/COASTAL	TANJUNG SEPANG	1443969	N 01° 23' 01.2"	E 104° 06' 44.8"
44	JOHOR	PANTAI/COASTAL	PANTAI PUNGGUR	1531974	N 01° 41' 05.0"	E 103° 05' 54.0"
45	JOHOR	KUALA/ESTUARINE	SUNGAI KIM-KIM	1439965	N 01° 25' 24.0"	E 103° 54' 03.0"
46	JOHOR	PANTAI/COASTAL	TANJUNG BIN	1336975	N 01° 19' 28.4"	E 103° 33' 25.8"
47	JOHOR	PANTAI/COASTAL	HADAPAN JABATAN LAUT	1438943	N 01° 22' 57.9"	E 103° 32' 07.6"
48	JOHOR	PANTAI/COASTAL	PELABUHAN TJ. PELEPAS	1438918	N 01° 21' 13.0"	E 103° 32' 35.0"
49	JOHOR	KUALA/ESTUARINE	PULAU BELUNGKOR	EM4	N 01° 26' 25.8"	E 104° 03' 11.04"
50	JOHOR	PANTAI/COASTAL	PULAU TEKONG	EM5	N 01° 25' 42.3"	E 104° 04' 36.72"
51	JOHOR	PANTAI/COASTAL	PULAU TEKONG	EM6	N 01° 23' 19.2"	E 104° 05' 20.40"
52	JOHOR	PANTAI/COASTAL	JETI PULAREK	EM7	N 01° 21' 26.8"	E 104° 04' 40.65"
53	JOHOR	PANTAI/COASTAL	TANJUNG PENGELIH	WQ10	N 01° 19' 52.62"	E 104° 05' 39.57"
54	JOHOR	PANTAI/COASTAL	PULAU MERAMBONG	WM1	N 01° 20' 17.02"	E 103° 37' 36.29"
1	PAHANG	PANTAI/COASTAL	PANTAI SEPAT	3633940A	N 03° 42' 02.0"	E 103° 20' 16.0"
		PANTAI/COASTAL		3633940B	N 03° 41' 54.0"	E 103° 20' 19.0"
2	PAHANG	PANTAI/COASTAL	PANTAI BATU HITAM	3833915A	N 03° 53' 06"	E 103° 21' 58"
		PANTAI/COASTAL		3833915B	N 03° 53' 09"	E 103° 21' 59"
3	PAHANG	PANTAI/COASTAL	PANTAI CHERATING (Club Med)	4133903A	N 04° 08' 41.0"	E 103° 24' 31.0"
		PANTAI/COASTAL		4133903B	N 04° 07' 51.0"	E 103° 24' 23"
4	PAHANG	PANTAI/COASTAL	PANTAI CHERATING (Legend)	4133942A	N 04° 06' 16.0"	E 103° 23' 06"
		PANTAI/COASTAL		4133942B	N 04° 06' 12.0"	E 103° 23' 07"
5	PAHANG	PANTAI/COASTAL	PANTAI KUALA API-API	3235917	N 03° 31' 20.0"	E 103° 23' 45.0"
6	PAHANG	PANTAI/COASTAL	PANTAI MUHIBBAH BALOK	3933901A	N 03° 55' 28.0"	E 103° 22' 21.1"
		PANTAI/COASTAL		3933901B	N 03° 55' 30.0"	E 103° 22' 23.0"
7	PAHANG	PANTAI/COASTAL	PANTAI BESERAH	3933941A	N 03° 54' 41.0"	E 103° 22' 02.0"
		PANTAI/COASTAL		3933941B	N 03° 54' 39.0"	E 103° 22' 01.0"
8	PAHANG	PANTAI/COASTAL	PANTAI TANJUNG BATU	3334915	N 03° 31' 10.0"	E 103° 23' 45.0"
9	PAHANG	PANTAI/COASTAL	PANTAI TELUK CEMPEDAK	3833910A	N 03° 48' 51"	E 103° 22' 19.0"
		PANTAI/COASTAL		3833910B	N 03° 48' 49.0"	E 103° 22' 21.0"

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2011 (sambungan)
Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2011 (continued)

Bil./ No.	Negeri / State	Kawasan / Area	Nama Stesen / Station Name	No. Stesen / Station No.	Longitude / Longitude	Latitude / Latitude
10	PAHANG	PANTAI/COASTAL	PANTAI TELUK GELORA	3833909A	N 03° 48' 16.0"	E 103° 20' 43.0"
		PANTAI/COASTAL		3833909B	N 03° 48' 20.0"	E 103° 20' 43.0"
11	PAHANG	PANTAI/COASTAL	PANTAI LEGENDA	3534943A	N 03° 12' 16.7"	E 103° 26' 53.7"
		PANTAI/COASTAL		3534943B	N 03° 12' 16.7"	E 103° 26' 53.7"
1	TERENGGANU	KUALA/ESTUARINE	KUALA SG. BESUT	5825902	N 05° 50' 02.8"	E 102° 33' 28.8"
2	TERENGGANU	KUALA/ESTUARINE	KUALA SG. DUNGUN	4734918	N 04° 46' 48.9"	E 103° 25' 21.6"
3	TERENGGANU	KUALA/ESTUARINE	KUALA SG. IBAI	5231949	N 05° 17' 06.1"	E 103° 10' 06.5"
4	TERENGGANU	KUALA/ESTUARINE	KUALA SG. KERTEH	4534922	N 04° 30' 59.1"	E 103° 26' 52.6"
5	TERENGGANU	KUALA/ESTUARINE	UTARA TIOXIDE	4234950	N 04° 17' 06.3"	E 103° 28' 20.9"
6	TERENGGANU	KUALA/ESTUARINE	TENGAH TIOXIDE (DISCHARGE)	4234951	N 04° 16' 22.8"	E 103° 28' 12.7"
7	TERENGGANU	KUALA/ESTUARINE	SELATAN TIOXIDE	4234952	N 04° 15' 04.1"	E 103° 27' 59.2"
8	TERENGGANU	KUALA/ESTUARINE	KUALA SG. MARANG	5232911	N 05° 12' 24.7"	E 103° 12' 28.9"
9	TERENGGANU	KUALA/ESTUARINE	KUALA SG. PAKA	4634920	N 04° 39' 29.7"	E 103° 25' 57.7"
10	TERENGGANU	KUALA/ESTUARINE	KUALA SG. SETIU	5627953	N 05° 40' 05.9"	E 102° 42' 26.9"
11	TERENGGANU	KUALA/ESTUARINE	KUALA SG. TERENGGANU	5331907	N 05° 20' 22.1"	E 103° 08' 12.6"
12	TERENGGANU	KUALA/ESTUARINE	KUALA SUNGAI KEMAMAN	4234929	N 04° 14' 25.2"	E 102° 26' 48.8"
13	TERENGANU	KUALA/ESTUARINE	KUALA PULAU DUYUNG	5231908	N 04° 20' 05.5"	E 103° 07' 44.5"
14	TERENGGANU	PANTAI/COASTAL	PANTAI BATU BURUK	5331935	N 05° 19' 29.1"	E 103° 09' 01.4"
15	TERENGGANU	PANTAI/COASTAL	PANTAI BUKIT KELUANG	5825903	N 05° 50' 02.8"	E 102° 36' 01.4"
16	TERENGGANU	PANTAI/COASTAL	PANTAI CHENDERING	5231934	N 05° 16' 11.8"	E 103° 10' 51.9"
17	TERENGGANU	PANTAI/COASTAL	PANTAI RANTAU ABANG	4833917	N 04° 52' 11.4"	E 103° 23' 17.4"
18	TERENGGANU	PANTAI/COASTAL	KIPC UTARA	4634953	N 04° 36' 37.9"	E 103° 26' 39.2"
19	TERENGGANU	PANTAI/COASTAL	KIPC TENGAH	4534954	N 04° 34' 54.9"	E 103° 27' 19.5"
20	TERENGGANU	PANTAI/COASTAL	KIPC SELATAN	4534955	N 04° 30' 09.5"	E 103° 26' 52.6"
1	KELANTAN	KUALA/ESTUARINE	KUALA SUNGAI KEMASIN	5824914	N 5° 53' 50.0"	E 102° 29' 05.0"
2	KELANTAN	KUALA/ESTUARINE	KUALA SG. GOLOK	6220911	N 6° 14' 05.0"	E 102° 05' 35.0"
3	KELANTAN	KUALA/ESTUARINE	KUALA SG. KELANTAN	6222901	N 6° 13' 12.0"	E 102° 13' 50.0"
4	KELANTAN	KUALA/ESTUARINE	KUALA SG. PENG. DATU	6123913	N 6° 10' 20.0"	E 102° 20' 40.0"
5	KELANTAN	KUALA/ESTUARINE	KUALA SG.PENG.CHEPA	6223912	N 6° 12' 20.0"	E 102° 18' 10.0"
6	KELANTAN	PANTAI/COASTAL	PANTAI BISIKAN BAYU	5825905	N 5° 52' 00.0"	E 102° 31' 00.0"
7	KELANTAN	PANTAI/COASTAL	PANTAI CAHAYA BULAN	6122903	N 6° 10' 45.0"	E 102° 16' 50.0"
8	KELANTAN	PANTAI/COASTAL	PANTAI IRAMA BACHOK	6024908	N 6° 03' 00.0"	E 102° 25' 15.0"
9	KELANTAN	PANTAI/COASTAL	PANTAI SABAK	6123909	N 6° 10' 25.0"	E 102° 20' 10.0"
10	KELANTAN	PANTAI/COASTAL	PANTAI SERI TUJUH	6221910	N 6° 13' 00.0"	E 102° 08' 00.0"
1	W.P. LABUAN	PANTAI/COASTAL	LAYANG-LAYANGAN	5251902	N 05° 20' 01.0"	E 115° 11' 37.0"
2	W.P. LABUAN	PANTAI/COASTAL	TANJUNG ARU	5251903	N 05° 21' 02.0"	E 115° 14' 39.0"
3	W.P. LABUAN	PANTAI/COASTAL	PULAU PAPAN	5151905	N 05° 15' 22.0"	E 115° 16' 03.0"
4	W.P. LABUAN	PANTAI/COASTAL	KIAMSAM	5151906	N 05° 15' 22.0"	E 115° 10' 28.0"
5	W.P. LABUAN	PANTAI/COASTAL	SUNGAI PAGAR	5151907	N 05° 16' 20.0"	E 115° 10' 19.0"
1	SABAH	KUALA/ESTUARINE	KUALA SG. MENGGATAL/ INANAM	5050905	N 05° 01' 05.0"	E 115° 07' 07.0"
2	SABAH	KUALA/ESTUARINE	KUALA SG. PENYU	5453901	N 05° 34' 13.0"	E 115° 35' 55.0"
3	SABAH	PANTAI/COASTAL	BORNEO GOLF SEAWATER	5355901	N 05° 33' 00.0"	E 115° 47' 01.0"
4	SABAH	PANTAI/COASTAL	PANTAI BAK-BAK KUDAT	6665901	N 06° 56' 44.0"	E 116° 50' 23.0"
5	SABAH	PANTAI/COASTAL	PANTAI ULU TUNGKU, LAHAD DATU	5085901	N 05° 01' 09.0"	E 118° 53' 09.0"
6	SABAH	PANTAI/COASTAL	PANTAI BATU SAPI	5580903	N 05° 47' 42.0"	E 118° 02' 22.0"
7	SABAH	PANTAI/COASTAL	PANTAI DALIT, TUARAN	6161901	N 06° 11' 25.0"	E 116° 09' 45.0"
8	SABAH	PANTAI/COASTAL	PANTAI LOK KAWI	5560904	N 05° 55' 00.0"	E 116° 02' 00.0"
9	SABAH	PANTAI/COASTAL	PANTAI MANGROVE PARADISE, TUARAN	6161902	N 06° 15' 02.0"	E 116° 13' 50.0"
10	SABAH	PANTAI/COASTAL	PANTAI MANIS, PAPAR	5555901	N 05° 45' 15.0"	E 115° 52' 04.0"
11	SABAH	PANTAI/COASTAL	PANTAI MELINSUNG, PAPAR	5565902	N 05° 50' 18.0"	E 115° 50' 45.0"
12	SABAH	PANTAI/COASTAL	PANTAI PASIR PUTIH, SANDAKAN	5580901	N 05° 49' 26.0"	E 118° 04' 58.0"

Jadual 4.4 JAS: Stesen Pengawasan Kualiti Air Marin Kebangsaan, 2011 (sambungan)
Table 4.4 DOE: Marine Water Quality Monitoring Stations, 2011 (continued)

Bil./ No.	Negeri / State	Kawasan / Area	Nama Stesen / Station Name	No. Stesen / Station No.	Longitude / Longitude	Latitude / Latitude
13	SABAH	PANTAI/COASTAL	PANTAI SABANDAR, TUARAN	6161903	N 06° 15' 02.2"	E 116° 13' 50.0"
14	SABAH	PANTAI/COASTAL	PANTAI SARINA, KUNAK	4481901	N 04° 39' 41.0"	E 118° 17' 01.0"
15	SABAH	PANTAI/COASTAL	PANTAI KG. LAMAK LAHAD DATU	4581902	N 04° 56' 39.8"	E 118 ° 11' 34.0"
16	SABAH	PANTAI/COASTAL	PANTAI TELUK BRUNEI 1	5053901	N 05° 09' 55.0"	E 115° 32' 53.0"
17	SABAH	PANTAI/COASTAL	PANTAI TELUK BRUNEI 2	5053902	N 05° 09' 55.0"	E 115° 32' 53.0"
18	SABAH	PANTAI/COASTAL	PANTAI TELUK BRUNEI 3	5053903	N 05° 09' 55.0"	E 115° 32' 53.0"
19	SABAH	PANTAI/COASTAL	PANTAI TELUK BRUNEI 4	5053904	N 05° 09' 55.0"	E 115° 32' 53.0"
20	SABAH	PANTAI/COASTAL	PANTAI TELUK BRUNEI 5	5053905	N 05° 09' 55.0"	E 115° 32' 53.0"
21	SABAH	PANTAI/COASTAL	PANTAI TELUK BRUNEI 6	5053906	N 05° 09' 55.0"	E 115° 32' 53.0"
22	SABAH	PANTAI/COASTAL	PANTAI TG. ARU (REST LIDO)	5656901	N 05° 55' 01.0"	E 115° 59' 03.0"
23	SABAH	PANTAI/COASTAL	PANTAI TG. ARU (ROLLER SKATING)	5656902	N 05° 55' 01.0"	E 115° 59' 03.0"
24	SABAH	PANTAI/COASTAL	PANTAI TG.ARU (No. 3)	5656903	N 05° 55' 01.0"	E 115° 59' 03.0"
25	SABAH	PANTAI/COASTAL	PANTAI TINAGAT, TAWAU	4473901	N 04° 13' 22.0"	E 117° 59' 04.0"
26	SABAH	PANTAI/COASTAL	KASTAM LAMA SANDAKAN (PANTAI TLDM)	5580902	N 05° 50' 00.0"	E 118° 08' 01.0"
1	SARAWAK	KUALA/ESTUARINE	KUALA BAKO	1704905	N 01° 40' 00.0"	E 110° 52' 08.0"
2	SARAWAK	KUALA/ESTUARINE	KUALA BATANG KEMENA	3130911	N 03° 10' 53.0"	E 113° 01' 40.0"
3	SARAWAK	KUALA/ESTUARINE	KUALA BATANG RAJANG	2111909	N 02° 07' 22.0"	E 111° 11' 21"
4	SARAWAK	KUALA/ESTUARINE	KUALA SG. MIRI	4349915	N 04° 23' 59.0"	E 113° 58' 25.0"
5	SARAWAK	KUALA/ESTUARINE	KUALA SG. SANTUBONG	1702903	N 01° 46' 38.0"	E 110° 16' 46.0"
6	SARAWAK	KUALA/ESTUARINE	KUALA SG. SEMATAN	1898901	N 01° 48' 49.0"	E 109° 46' 29.0"
7	SARAWAK	KUALA/ESTUARINE	KUALA SG. SARAWAK	1604907	N 01° 36' 44.0"	E 110° 29' 44.0"
8	SARAWAK	KUALA/ESTUARINE	KUALA MUKAH	2920920	N 02° 54' 41.0"	E 112° 05' 25.0"
9	SARAWAK	PANTAI/COASTAL	PANTAI BAKO	1704906	N 01° 42' 49.0"	E 110° 25' 40.0"
10	SARAWAK	PANTAI/COASTAL	PANTAI BELAWAI	2212913	N 02° 14' 27.0"	E 111° 12' 51.0"
11	SARAWAK	PANTAI/COASTAL	PANTAI BRIGHTON	4449917	N 04° 22' 25.0"	E 113° 57' 51.0"
12	SARAWAK	PANTAI/COASTAL	PANTAI DAMAI	1702904	N 01° 47' 55.0"	E 110 17' 58.0"
13	SARAWAK	PANTAI/COASTAL	PANTAI LIKAU	3230915	N 03° 20' 49.0"	E 113° 08' 57.0"
14	SARAWAK	PANTAI/COASTAL	PANTAI PANDAN	1824918	N 01° 50' 16.0"	E 109 40' 11.0"
15	SARAWAK	PANTAI/COASTAL	PANTAI PASIR PUTIH	1604910	N 01° 30' 14.0"	E 110 30' 00.0"
16	SARAWAK	PANTAI/COASTAL	PANTAI PIASAU	4539918	N 04° 27' 27.0"	E 113° 59' 38.0"
17	SARAWAK	PANTAI/COASTAL	PANTAI SEMATAN	1898902	N 01° 49' 38.0"	E 109° 46' 29.0"
18	SARAWAK	PANTAI/COASTAL	PANTAI TANJUNG BATU	3230913	N 03° 12' 38.0"	E 113° 02' 26.0"
19	SARAWAK	PANTAI/COASTAL	PANTAI HARMONI	2920921	N 02° 54' 35.0"	E 112° 03' 22.0"
20	SARAWAK	PANTAI/COASTAL	PANTAI TANJUNG KEMBANG	1810923	N 01° 49' 28.0"	E 111° 05' 44.0"
21	SARAWAK	KUALA/ESTUARINE	KUALA SG BARAM	4539919	N 04° 34' 50.9"	E 113° 58' 48.0"
22	SARAWAK	PANTAI/COASTAL	PANTAI ESPLANED	4339920	N 04° 19' 04.6"	E 113° 57' 31.0"
23	SARAWAK	PANTAI/COASTAL	PANTAI BERAYA	4238921	N 04° 12' 45.1"	E 113° 53' 30.6"
24	SARAWAK	PANTAI/COASTAL	PANTAI BUNGAI	4137922	N 04° 03' 42.2"	E 113° 46' 50.3"
25	SARAWAK	PANTAI/COASTAL	PANTAI EMAS	3331926	N 03° 26' 27.8"	E 113° 13' 27.7"
26	SARAWAK	KUALA/ESTUARINE	MUARA KUALA PANIPAP	3332927	N 03° 29' 48.5"	E 113° 17' 07.6"
27	SARAWAK	PANTAI/COASTAL	PANTAI TANJUNG SIMALAJU	3431928	N 03° 33' 05.9"	E 113° 10' 03.7"
28	SARAWAK	PANTAI/COASTAL	PANTAI KUALA NYALAU	3432929	N 03° 38' 06.7"	E 113° 22' 30.2"

Kuala / Estuarine : 78
Pantai / Coastal : 168
Jumlah / Total : 246

Jadual 4.5 JAS: Senarai Stesen Baru Dibuka, 2011
Table 4.5 DOE: List of Newly-Opened Stations, 2011

Bil. / No	Negeri / State	Kawasan / Area	Nama Stesen / Station	No. Stesen / Station No.	Latitud / Latitude	Longitud / Longitude
1	NEGERI SEMBILAN	PANTAI/ COASTAL	PANTAI CERMIN	2416918	N 02° 24' 54.0"	E 101° 51' 38.4"
2	TERENGGANU	KUALA/ ESTUARINE	KUALA PULAU DUYUNG	5231908	N 04° 20' 05.5"	E 103° 07' 44.5"

Jadual 4.6 JAS: Stesen Pengawasan 'Malaysia-Singapore Joint Committee on the Environment' (MSJCE), 2011
Table 4.6 DOE: Monitoring Stations under the Malaysia-Singapore Joint Committee on the Environment (MSJCE), 2011

Bil. / No.	Negeri / State	Kawasan / Area	Nama Stesen / Station	No. Stesen / Station No.	Latitud / Latitude	Longitud / Longitude
1	JOHOR	PANTAI/ COASTAL	KG. TANJUNG KOPOK	SJ1	N 01° 25' 31.0"	E 104° 00' 03"
2	JOHOR	PANTAI/ COASTAL	KG. PASIR PUTIH	SJ2	N 01° 25' 48.0"	E 103° 55' 40.0"
3	JOHOR	PANTAI/ COASTAL	J/K SULTAN ISKANDAR	SJ3	N 01° 26' 49.0"	E 103° 46' 09.0"
4	JOHOR	PANTAI/ COASTAL	KG. SENIBUNG	SJ4	N 01° 29' 01.0"	E 103° 48' 47.0"
5	JOHOR	KUALA/ ESTUARINE	KUALA SG. TEBRAU	SJ4A	N 01° 28' 56.0"	E 103° 47' 48.0"
6	JOHOR	PANTAI/ COASTAL	TANJUNG PUTRI	SJ5	N 01° 27' 20.0"	E 103° 46' 09.0"
7	JOHOR	PANTAI/ COASTAL	HADAPAN MPJB	SJ6	N 01° 27' 08.0"	E 103° 45' 43.0"
8	JOHOR	PANTAI/ COASTAL	TANJUNG DANGA	SJ7	N 01° 27' 24.0"	E 103° 42' 52.0"
9	JOHOR	KUALA/ ESTUARINE	KUALA SG. SKUDAI	SJ7A	N 01° 27' 46.0"	E 103° 43' 22.0"
10	JOHOR	PANTAI/ COASTAL	HADAPAN PUSAT ISLAM	SJ7B	N 01° 27' 19.0"	E 103° 44' 51.0"
11	JOHOR	PANTAI/ COASTAL	TEBING RUNTUH	SJ8	N 01° 25' 10.0"	E 103° 40' 06.0"
12	JOHOR	KUALA/ ESTUARINE	KUALA SG. MELAYU	SJ8A	N 01° 26' 53.0"	E 103° 41' 53.0"
13	JOHOR	PANTAI/ COASTAL	TANJUNG BUNGA	SJ9	N 01° 23' 07.0"	E 103° 39' 02.0"
14	JOHOR	PANTAI/ COASTAL	TANJUNG KUPANG	SJ10	N 01° 23' 36.0"	E 103° 39' 11.0"
15	JOHOR	PANTAI/ COASTAL	PULAU BELUNGKOR	EM4	N 01° 26' 25.8"	E 104° 03' 11.04"
16	JOHOR	PANTAI/ COASTAL	PULAU TEKONG	EM5	N 01° 25' 42.3"	E 104° 04' 36.72"
17	JOHOR	PANTAI/ COASTAL	PULAU TEKONG	EM6	N 01° 23' 19.2"	E 104° 05' 20.40"
18	JOHOR	PANTAI/ COASTAL	JETI PULAREK	EM7	N 01° 21' 26.8"	E 104° 04' 40.65"
19	JOHOR	PANTAI/ COASTAL	TANJUNG PENGELIH	WQ10	N 01° 19' 52.62"	E 104° 05' 39.57"
20	JOHOR	PANTAI/ COASTAL	PULAU MERAMBONG	WM1	N 01° 20' 17.02"	E 103° 37' 36.29"

Jadual 4.7 JAS: Program Audit Pengawasan Air Marin
Table 4.7 DOE: Marine Surveillance Audit Programme

Tarikh / Date	Aktiviti / Activities	Tempat / Venue
21 - 22 Mac 2011/ 21 - 22 Mar 2011	Program Audit Pengawasan Marin di Negeri Sembilan / Marine Surveillance Audit Programme in Negeri Sembilan	Perairan sekitar Negeri Sembilan / Coastal waters around Negeri Sembilan
20 - 22 Jun 2011/ 20 - 22 June 2011	Program Audit Pengawasan Marin di Pahang / Marine Surveillance Audit Programme in Pahang	Pulau-Pulau di Pahang / Islands in Pahang
26 - 28 Julai 2011/ 26 - 28 July 2011	Program Audit Pengawasan Marin di Labuan / Marine Surveillance Audit Programme in Labuan	Perairan sekitar Labuan / Coastal waters around Labuan
17 - 20 Oktober 2011/ 17 - 20 October 2011	Program Audit Pengawasan Marin di Pulau Langkawi / Marine Surveillance Audit Programme in Pulau Langkawi	Perairan sekitar Pulau Langkawi / Coastal waters around Pulau Langkawi

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

Malaysia dikurniakan banyak pulau yang kaya dengan sumber akuatik. Kualiti air marin memainkan peranan yang penting dalam pemuliharaan sumber semulajadi ini. Sehubungan dengan itu, Program Pengawasan Kualiti Air Marin Pulau-Pulau telah dimulakan pada Julai 1998.

Bagi tahun 2011, program ini melibatkan 72 buah pulau terpilih dengan 87 buah stesen pengawasan. Pulau-pulau ini dikelaskan mengikut empat kategori iaitu pulau-pulau pembangunan (3); pulau-pulau peranginan (31); pulau-pulau Taman Laut (26); dan pulau-pulau yang dilindungi (12) (**Jadual 4.8**). Frekuensi persampelan bagi Pulau Pembangunan adalah dua (2) kali setahun manakala bagi pulau yang lainnya sebanyak tiga (3) kali setahun. Sebanyak 10 stesen yang terletak berdekatan dengan tanah besar digugurkan (**Jadual 4.9**) dan 9 stesen dibuka di kawasan baru bagi memperluaskan rangkaian program pengawasan kualiti air marin pulau-pulau (**Jadual 4.10**).

Pengukuran parameter-parameter fizikal kualiti air marin dibuat secara *in-situ* seperti suhu, pH, konduktiviti, kemasinan, oksigen terlarut dan kekeruhan manakala 14 parameter yang dianalisis di makmal pula adalah seperti jumlah pepejal terampai, *Escherichia coli*, nitrat, fosfat, jumlah karbon organik, minyak dan gris termasuk logam berat seperti Merkuri (Hg), Kadmium (Cd), Kromium (Cr), Kuprum (Cu), Plumbum (Pb), Arsenik (As), Tributiltin (TBT) dan Trifeniltin (TPT) **(Jadual 4.11**). Percontohan bebola tar di pantai juga dilaksanakan.

Malaysia is endowed with many islands rich in marine aquatic resources. The quality of marine water plays an important role in the conservation of these resources. To achieve this, the Island Marine Water Quality Monitoring Programme was started in July 1998.

In 2011, the monitoring programme covers 72 selected islands with 87 monitoring stations. These islands are classified into four categories; development islands (3); resort islands (31); Marine Park Islands (26); and protected islands (12) (**Table 4.8**). The sampling frequency for Development Islands was two (2) times per year, while the frequency for the others was three (3) times per year. Ten (10) stations located near the mainland were dropped (**Table 4.10**) and nine (9) new stations were established at nine (9) new locations to widen the monitoring network coverage.

Marine water quality monitoring includes measurement of in-situ parameters such as temperature, pH, conductivity, salinity, dissolved oxygen, turbidity; while laboratory analysis involves 14 other parameters such as total suspended solids, *Escherichia coli*, nitrate, phosphate, total organic carbon, oil and grease, and heavy metals like Mercury (Hg), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Arsenic (As), Tributyltin (TBT) and Triphenyltin (TPT) (**Table 4.11**). Tarball samplings on beaches were also conducted.

Jadual 4.8 JAS: Pengawasan Kualiti Air Marin Pulau, 2011
Table 4.8 DOE: Island Water Quality Monitoring, 2011

Bil. / No.	Negeri / State	Pulau / Island	Kategori / Category	Bilangan Stesen / No. of Station	Latitud / Latitude	Longitud / Longitude
1.	KEDAH	Singa Besar	R	1	N 06° 13' 36.3"	E 099° 44' 42.9"
		Dayang Bunting	R	1	N 06° 12' 26.2"	E 099° 46' 48.9"
		Langkawi	D	1	N 06° 18' 34.8"	E 099° 51' 00.3"
		Langkawi	D	1	N 06° 25' 51.1"	E 099° 45' 49.0"
		Langkawi	D	1	N 06° 18' 51.9"	E 099° 42' 30.1"
		Langkawi	D	1	N 06° 27' 24.6"	E 099° 49' 27.6"
		Payar	M	1	N 06° 03' 78.7"	E 100° 02' 53.0"
		Kaca	M	1	N 06° 04' 29.7"	E 100° 02' 96.9"
		Lembu	M	1	N 06° 04' 44.0"	E 100° 03' 48.3"
		Segantang	M	1	N 06° 02' 60.9"	E 099° 55' 56.0"
2.	PERAK	Pangkor	R	1	N 04° 11' 33.8"	E 100° 34' 51.8"
		Pangkor	R	1	N 04° 15' 10.7"	E 100° 32' 39.3"
		Pangkor Laut	R	1	N 04° 12' 14.1"	E 100° 32' 53.0"
		Sembilan	R	1	N 04° 00' 30.7"	E 100° 32' 38.4"
		Tukun Perak	P	1	N 04° 07' 32.4"	E 100° 33' 40.3"
3.	P. PINANG	Aman	R	1	N 05° 16' 01.0"	E 100° 23' 63.5"
		Jerejak	R	1	N 05° 16' 51.2"	E 100° 11' 24.6"
		Kendi	R	1	N 05° 13' 849"	E 100° 10' 804"
		Rimau	R	1	N 05° 14' 722"	E 100° 16' 376"
		Gedong	R	1	N 05° 16' 888"	E 100° 23' 357"
		Pulau Pinang	D	1	N 05° 17' 08.5"	E 100° 17' 31.5"
		Pulau Pinang	D	1	N 05° 25' 274"	E 100° 20' 707"
4.	SELANGOR	Ketam	R	1	N 03° 01' 17.5"	E 101° 15' 46.4"
		Angsa	R	1	N 03° 11' 08.0"	E 101° 13' 07.1"
		Lumut	R	1	N 02° 59' 54.6"	E 101° 21' 42.6"
5.	NEGERI SEMBILAN	Arang	P	1	N 02° 31' 03.5"	E 101° 47' 37.8"
6.	MELAKA	Besar	R	1	N 02° 06' 55.8"	E 102° 20' 10.6"
		Upeh	R	1	N 02° 11' 39.5"	E 102° 12' 17.2"
		Undan	R	1	N 02° 02' 50.5"	E 102° 20' 07.2"
		Besar (Point B)	R	1	N 02° 06' 24.2"	E 102° 19' 20.8"
		Upeh (Point B)	R	1	N 02° 11' 23.1"	E 102° 12' 11.6"
		Undan (Point B)	R	1	N 02° 02' 50.2"	E 102° 20' 06.5"
7.	PAHANG	Tioman	M	1	N 02° 44' 22.0"	E 104° 07' 53.4"
		Seri Buat	M	1	N 02° 41' 07.4"	E 103° 55' 24.6"
		Cebeh	M	1	N 02° 55' 53.6"	E 104° 05' 51.4"
		Tulai	M	1	N 02° 54' 42.1"	E 104° 06' 51.9"
		Labas	M	1	N 02° 53' 23.7"	E 104° 03' 56.6"
		Sembilang	M	1	N 02° 40' 53.8"	E 103° 53' 28.4"

Jadual 4.8 JAS: Pengawasan Kualiti Air Marin Pulau, 2011 (sambungan)
Table 4.8 DOE: Island Water Quality Monitoring, 2011 (continued)

Bil. / No.	Negeri / State	Pulau / Island	Kategori / Category	Bilangan Stesen / No. of Station	Latitud / Latitude	Longitud / Longitude
		Tioman (Teluk Salang)	M	1	N 02° 52' 35.5"	E 104° 09' 13.9"
		Sepui	M	1	N 02° 53' 09.6"	E 104° 44' 05.1"
8.	JOHOR	Setindan	R	1	N 02° 28' 35.9"	E 103° 51' 28.7"
		Babi Tengah	M	1	N 02° 28' 20.4"	E 103° 51' 41.9"
		Dayang	R	1	N 02° 28' 12.8"	E 104° 30' 12.9"
		Nanga Besar	M	1	N 02° 16' 18.0"	E 104° 37' 37.5"
		Sibu Tengah	R	1	N 02° 10' 54.9"	E 104° 05' 45.4"
		Pemanggil	M	1	N 02° 04' 52.1"	E 104° 18' 54.8"
		Kukup	P	1	N 01° 19' 41.9"	E 103° 26' 12.0"
		Pisang	P	1	N 01° 28' 05.8"	E 103° 15' 45.5"
9.	TERENGGANU	Gumia	R	1	N 05° 13' 51.8"	E 103° 15' 39.3"
		Lang Tengah	M	1	N 05° 47' 32.9"	E 102° 53' 27.1"
		Perhentian Besar	M	1	N 05° 53' 21.5"	E 102° 45' 01.8"
		Perhentian Kecil	M	1	N 05° 55' 04.5"	E 102° 43' 30.4"
		Redang	M	1	N 05° 46' 59.2"	E 103° 02' 17.0"
		Pinang	M	1	N 05° 44' 52.7"	E 103° 00' 09.4"
		Ekor Tebu	M	1	N 05° 44' 25.6"	E 103° 01' 45.4"
		Lima	M	1	N 05° 46' 11.5"	E 103° 03' 32.6"
		Redang (Pasir Panjang)	M	1	N 05° 46' 34.0"	E 103° 02' 03.7"
		Kapas	R	1	N 03° 13' 01.1"	E 103° 15' 64.1"
10.	KELANTAN	Panjang	P	1	N 06° 11' 15.8"	E 102° 18' 32.7"
		Kundur	P	1	N 06° 13' 00.6"	E 102° 14' 87.1"
11.	SABAH	Gaya	R	1	N 06° 00' 58.7"	E 116° 03' 12.1"
		Mabul	R	1	N 04° 15' 04.0"	E 118° 38' 02.4"
		Sipadan	R	1	N 04° 07' 05.2"	E 118° 37' 37.3"
		Sipadan	R	1	N 04° 06' 51.0"	E 118° 37' 32.9"
		Sapi	M	1	N 06° 00' 59.9"	E 116° 00' 53.6"
		Manukan	R	1	N 05° 58' 39.8"	E 116° 00' 44.7"
		Tiga	R	1	N 05° 43' 17.4"	E 115° 39' 02.4"
		Kalampunian Besar	M	1	N 05° 45' 51.0"	E 115° 40' 71.0"
		Kapalai	R	1	N 04° 13' 52.0"	E 118° 41' 08.2"
		Ligitan	R	1	N 04° 09' 52.0"	E 118° 50' 35.9"
		Molleangan Besar	R	1	N 07° 04' 90.6"	E 117° 02' 51.5"
		Banggi	R	1	N 07° 06' 53.0"	E 117° 05' 13.4"
		Balambangan	R	1	N 07° 11' 76.9"	E 116° 52' 19.5"
		Silingan	P	1	N 06° 10' 43.3"	E 118° 03' 50.0"
		Gulisan	P	1	N 06° 08' 93.3"	E 118° 03' 33.3"
		Banggi	P	1	N 07° 08' 21.2"	E 117° 05' 87.6"

Jadual 4.8 JAS: Pengawasan Kualiti Air Marin Pulau, 2011 (sambungan)
Table 4.8 DOE: Island Water Quality Monitoring, 2011 (continued)

Bil. / No.	Negeri / State	Pulau / Island	Kategori / Category	Bilangan Stesen / No. of Station	Latitud / Latitude	Longitud / Longitude
12.	SARAWAK	Satang Besar	P	1	N 01° 46' 39.0"	E 110° 09' 53.7"
		Talang-Talang Kecil	P	1	N 01° 53' 42.9"	E 109° 45' 58.2"
		Talang-Talang Besar	P	1	N 01° 54' 39.7"	E 109° 46' 36.0"
13.	W. P. LABUAN	Labuan	D	1	N 05° 22' 49.9"	E 115° 13' 43.8"
		Labuan	D	1	N 05° 16' 21.9"	E 115° 14' 55.5"
		Labuan	D	1	N 05° 22' 18.6"	E 115° 14' 48.0"
		Labuan	D	1	N 05° 14' 30.9"	E 115° 14' 23.3"
		Kuraman	M	1	N 05° 13' 07.5"	E 115° 08' 25.5"
		Rusukan Kecil	M	1	N 05° 12' 06.4"	E 115° 08' 53.9"
		Rusukan besar	M	1	N 05° 11' 24.0"	E 115° 08' 31.2"

Pulau / Island	Bilangan Pulau / No. of Island	Bilangan Stesen / No. of Station
Pulau Peranginan / Resort Island (R)	34	37
Pulau Taman Laut / Marine Park Island (M)	26	30
Pulau Dilindungi / Protected Island (P)	12	12
Pulau Pembangunan / Development Island (D)	3	12
Jumlah / Total	**75**	**91**

Jadual 4.9 JAS: Senarai Stesen Yang Ditutup, 2011
Table 4.9 DOE: List of Closed Stations, 2011

Bil. / No.	Negeri / State	Pulau / Island	Kategori / Category	Bilangan Stesen / No. of Station	Latitud / Latitude	Longitud / Longitude
1.	**PERLIS**	Perak	P	1	N 05° 40' 59.4"	E 098° 56' 14.6"
2.	**PULAU PINANG**	Pulau Pinang	D	1	N 05° 16' 685"	E 100° 11' 436"
		Pulau Pinang	D	1	N 05° 27' 637"	E 100° 12' 829"
3.	**TERENGGANU**	Tenggol	P	1	N 04° 48' 33.8"	E 103° 40' 32.1"
		Nyireh	P	1	N 04° 50' 39.9"	E 103° 39' 47.5"
		Redang	M	1	N 05° 45' 27.4"	E 103° 00' 24.3"
		Bidong Laut	R	1	N 05° 36' 43.6"	E 103° 03' 23.7"
2.	**SABAH**	Bakungan Kecil	P	1	N 06° 09' 92.6"	E 118° 06' 49.8"
		Mantanani Besar	P	1	N 06° 42' 29.0"	E 116° 21' 40.2"
		Layang-Layang	R	1	N 07° 22' 12.6"	E 113° 50' 16.4"

Jadual 4.10 JAS : Senarai Stesen Yang Baru Dibuka, 2011
Table 4.10 DOE: List of Newly-Opened Stations, 2011

Bil./ No.	Negeri / State	Pulau / Island	Kategori / Category	Bilangan Stesen / No. Of Station	Latitud / Latitude	Longitud/ Longitude
1.	**KEDAH**	Payar	M	1	N 06° 03' 78.7"	E 100° 02' 53.0"
		Kaca	M	1	N 06° 04' 29.7"	E 100° 02' 96.9"
		Lembu	M	1	N 06° 04' 44.0"	E 100° 03' 48.3"
		Segantang	M	1	N 06° 02' 60.9"	E 099° 55' 56.0"
2.	**MELAKA**	Besar (Point B)	R	1	N 02° 06' 24.2"	E 102° 19' 20.8"
		Upeh (Point B)	R	1	N 02° 11' 23.1"	E 102° 12' 11.6"
		Undan (Point B)	R	1	N 02° 02' 50.2"	E 102º 20' 06.5"
3.	**PAHANG**	Tioman (Teluk Salang)	M	1	N 02° 52' 35.5"	E 104° 09' 13.9"
		Sepui	M	1	N 02° 53' 09.6"	E 104° 44' 05.1"

Jadual 4.11 JAS : Parameter Kualiti Air Marin, 2011
Table 4.11 DOE: Marine Water Quality Parameters, 2011

Bil. / No.	Parameter / Parameters	Kod / Code	Unit / Unit
	PENGUKURAN IN-SITU/ IN-SITU MEASUREMENTS		
1.	Oksigen Terlarut / Dissolved Oxygen	DO	mg/l
2.	Kemasinan / Salinity	*Sal*	%
3.	Suhu / Temperature	Temp	°C
4.	Konduktiviti / Conductivity	Cond	mS/cm
5.	Kekeruhan / Turbidity	Turb	NTU/FTU
6.	pH	pH	-
	PENGUKURAN MAKMAL/ LABORATORY MEASUREMENT		
1.	Jumlah pepejal terampai / Total Suspended Solid	TSS	mg/l
2.	*Escherichia coli*	*E.coli*	cfu/100 ml
3.	Minyak dan Gris / Oil and Grease	O&G	mg/l
4.	Kuprum / Copper	Cu	µg/l
5.	Kadmium / Cadmium	Cd	µg/l
6.	Plumbum / Lead	Pb	µg/l
7.	Arsenik / Arsenic	As	µg/l
8.	Merkuri / Mercury	Hg	µg/l
9.	Kromium / Chromium	Cr	µg/l
10.	Bebola tar / Tarball	Tar	g/100m
11.	Jumlah karbon organic/ Total Organic Carbon	TOC	mg/l
12.	Nitrat / Nitrate	NO_3^-	mg/l
13.	Fosfat / Phosphate	PO_4	mg/l
14.	Tributiltin / Tributyltin	TBT	µg/l
15.	Trifeniltin / Tripheniltin	TPT	µg/l

Program Pengawasan Kualiti Air Daratan (Sungai) 2011
Surface Water (River) Quality Monitoring Program, 2011

Jabatan Alam Sekitar (JAS) telah melaksanakan Program Pengawasan Kualiti Air Sungai sejak tahun 1978 untuk menentukan status terkini dan mengesan perubahan kualiti air sungai-sungai dari semasa ke semasa bagi mengenalpasti punca pencemaran dan merancang strategi penguatkuasaan.

Rangkaian stesen pengawasan kualiti air sungai pada tahun 2011 terdiri daripada 812 stesen manual yang mengawasi 464 batang sungai seluruh negara seperti dalam **Jadual 4.12**. Parameter-parameter kualiti air yang diukur terdiri daripada parameter fizikal, kimia dan biologikal seperti di **Jadual 4.13**.

Indeks Kualiti Air (IKA) dibentuk berdasarkan enam parameter utama seperti berikut:-

- Keperluan Oksigen Biokimia (BOD)
- Keperluan Oksigen Kimia (COD)
- Ammoniakal Nitrogen (NH_3N)
- pH
- Oksigen Terlarut (DO)
- Pepejal Terampai (SS)

Pada tahun 2011, kualiti air sungai juga diawasi secara terus menerus melalui stesen-stesen automatik yang ditempatkan di Sg. Perak (Perak), Sg. Selangor (Selangor), Sg. Klang (WPKL), Sg Linggi (Negeri Sembilan), Sg. Melaka (Melaka), Sg Skudai (Johor), Sg. Sarawak (Sarawak), Sg. Labu (N. Sembilan), Sg. Putat (Melaka) dan Sg Rajang (Sarawak). Parameter-parameter yang diukur dari adalah pH, oksigen terlarut, suhu, kekeruhan dan ammonium.

Kajian Khas Sungai Teris, Pahang

Satu kajian khas kualiti air sungai telah dijalankan pada suku terakhir tahun 2011 bertujuan untuk menentukan status kualiti air Sungai Teris dan mengenalpasti punca-punca pencemaran di dalam kawasan tadahannya. Pemilihan Sungai Teris adalah kerana jajaran sungai ini mengalir melalui kawasan

The Department of Environment (DOE) has implemented the National River Water Monitoring Program since 1978 to establish baselines and detect water quality changes in rivers across the country, hence enabling pollution sources being identified and plan strategic enforcement schemes.

In 2011, DOE's river water quality monitoring network comprises a total of 812 manual water quality monitoring stations (MWQM) which were located at 464 rivers in Malaysia as shown in **Table 4.12**. Water samples from the stations were analyzed and tested for physical, chemical and biological parameters as shown in **Table 4.13**.

River water quality is determined from Water Quality Index (WQI) which is derived based on six principal parameters namely;

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Ammoniacal Nitrogen (NH_3N)
- pH
- Dissolved Oxygen (DO)
- Suspended Solids (SS)

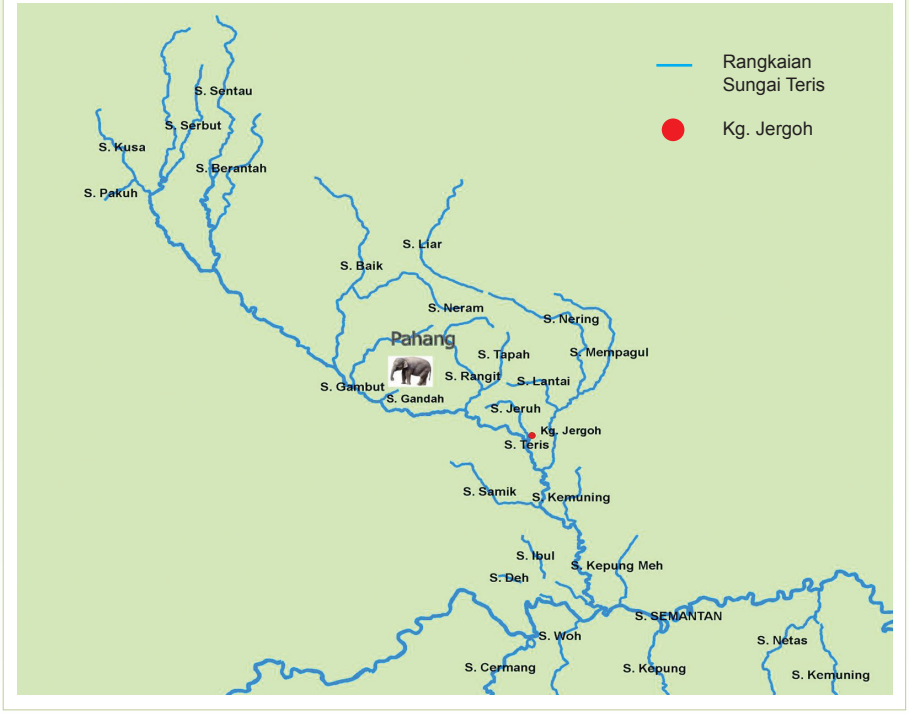
In 2011, DOE continuously monitored river water quality from ten active Continuous Water Quality Monitoring (CWQM) stations which were located at Sg. Perak (Perak), Sg. Selangor (Selangor), Sg Kelang (WP Kuala Lumpur), Sg. Linggi (Negeri Sembilan), Sg. Melaka (Melaka), Sg Skudai (Johor), Sg. Sarawak (Sarawak), Sg. Labu (N. Sembilan), Sg. Putat (Melaka) and Sg Rajang (Sarawak). The measured parameters are pH, dissolved oxygen, temperature, turbidity and ammonium.

Special Study of Sg. Teris

A special study has been conducted during the last quarter of 2011 to appraise water quality of Sg. Teris and to identify potential pollution sources to the river. The Sg. Teris flows through the National Elephant Conservation Centre, Kuala Gandah, Lanchang, Pahang. The study was to establish river water quality baseline data which

Pusat Konservasi Gajah Kebangsaan Kuala Gandah, Lanchang, Pahang. Kajian tersebut adalah untuk menentukan data garis dasar kualiti air sungai Teris bagi tujuan rujukan asas dalam perancangan dan pembangunan tanah dalam kawasan tadahannya pada masa hadapan, demi memastikan Pusat Konservasi Gajah Kebangsaan Kuala Gandah tersebut terpelihara. Setelah selesai kajian tersebut, Sg. Teris telah menjadi sebahagian daripada Program Pengawasan Kualiti Air Sungai Kebangsaan dan akan terus diawasi dari masa ke semasa. Lokasi Sg. Teris adalah seperti **Rajah 4.9**.

would be beneficial in future planning and development scheme within the catchment of Sg. Teris, in order to preserve the sanctuary system. After the study, the Sg. Teris is included in the DOE's national MWQM network and will be closely monitored from three new stations. The location of Sg. Teris is shown in **Figure 4.9**.



Rajah 4.9 JAS: Rangkaian Sungai Teris, Pahang
Figure 4.9 DOE: Sungai Teris, Pahang river network

Projek "Sungai Nadi Kehidupan"

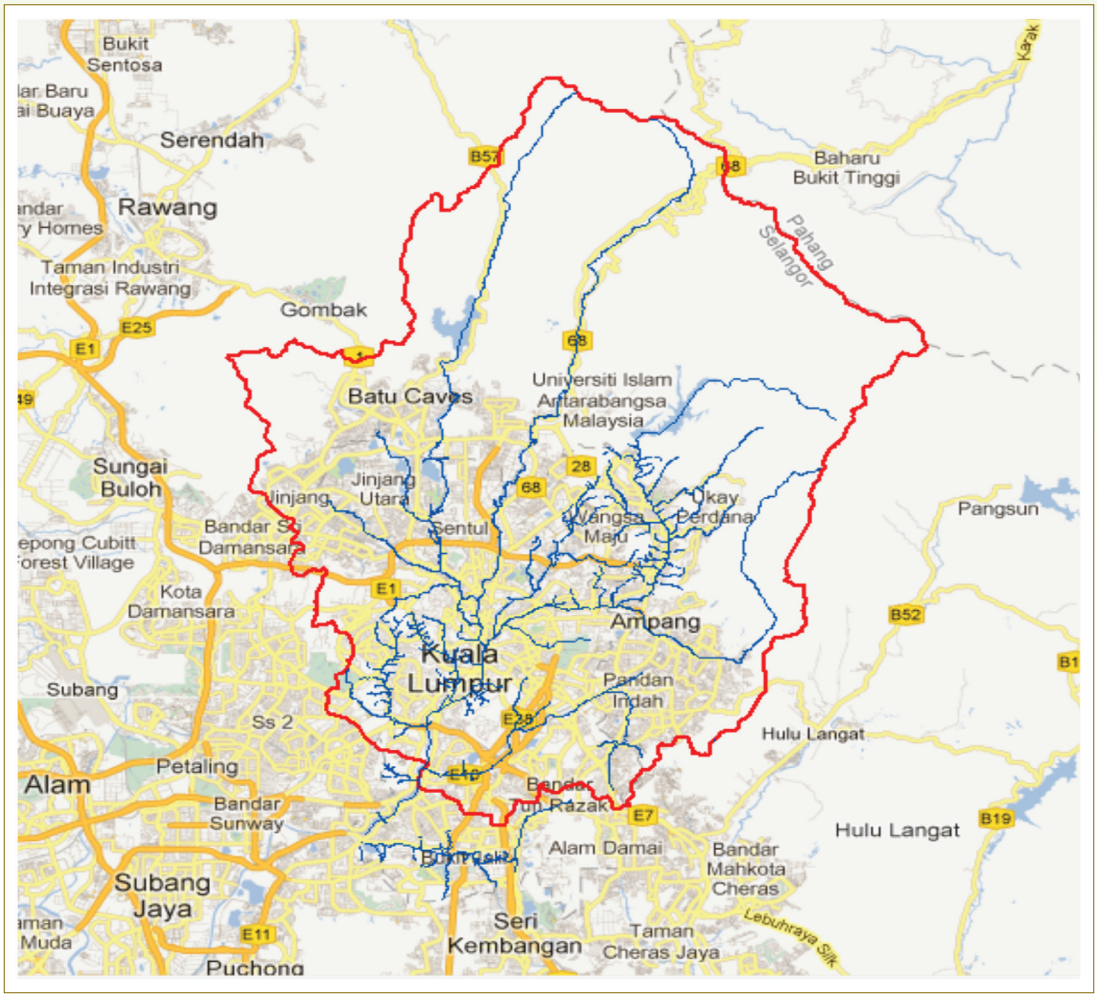
Projek "Sungai Nadi Kehidupan" atau *"River of Life"* adalah merupakan satu Projek Permulaan bagi unit Greater Kuala Lumpur/ Klang Valley sepertimana yang terkandung di bawah Bidang Ekonomi Utama Negara (NKEA). Projek tersebut bertujuan untuk meningkatkan kualiti air Sg. Klang dan anak-anak sungainya yang terletak dalam sempadan kawasan Projek kepada Kelas II. Jabatan Pengairan dan Saliran Malaysia (JPS) adalah agensi yang dipertanggungjawabkan bagi mengetuai Projek *River of Life* dengan penglibatan pelbagai agensi-agensi kerajaan yang lain termasuk JAS.

Project "River of Life"

"River of Life" is one of the Entry Point Project (EPP) identified under the Greater Kuala Lumpur/ Klang Valley unit as stated in National Key Economic Area (NKEA). The Project aims to improve the water quality of Sg. Klang and its subsequent tributaries into class II within the Project boundary. The lead agency, Department of Irrigation and Drainage (DID) in collaboration with various other government agencies and departments including DOE had been tasked to implement this project.

Pelaksanaan keseluruhan projek ini dilakukan melalui 12 inisiatif yang merangkumi tiga komponen iaitu pembersihan sungai, pengindahan sungai dan pembangunan tanah. JAS telah dilantik sebagai ketua bagi perlaksanaan Inisiatif 11 iaitu *Mempromosi, Menguatkuasa dan Menguruskan Kebersihan Sungai dan Kesihatan – Industri Yang Menghasilkan air sisa/efluen*. Secara umumnya, JAS terlibat dalam menjalankan pengawasan kualiti air sungai, meningkatkan penguatkuasaan dan mengenalpasti punca-punca pencemaran selain industri dan mencadangkan langkah bersesuaian yang boleh diambil untuk mengurang atau menghapuskan punca pencemaran di dalam kawasan Projek ini. **Rajah 4.10** menunjukkan sempadan Projek "Sungai Nadi Kehidupan".

The implementation of the Project consists of 12 key initiatives which cover river cleaning, river beautification and river development. DOE has been appointed to lead Initiative-11 of the Project which is *to promote, enforce and manage river cleanliness and health – industries that generate wastewater / effluent*. The involvement of DOE is mainly to monitor river water quality, increasing enforcement activities and joint enforcement with other agencies, identify pollution sources and proposing appropriate measures or actions to reduce or eliminate the pollution within the project area. The "River of Life" map is shown in **Figure 4.10.**



Rajah 4.10 JAS: Sempadan Projek "Sungai Nadi Kehidupan"
Figure 4.10 DOE: Map of "River of Life" Project Boundary

Audit Pengawasan Kualiti Air Sungai

Program audit pengawasan telah dilaksanakan pada November 2011 ke atas rangkaian stesen-stesen pengawasan kualiti air sungai manual di Sg. Rajang dan Sg. Salim di Sarawak. Tujuan program audit adalah untuk menilai pelaksanaan prosedur pengawasan kualiti air sungai oleh juruteknik kontraktor termasuk prosedur kerja-kerja persampelan, memeriksa penggunaan, penyelenggaraan dan kalibrasi alat kelengkapan pengawasan kualiti air.

Aktiviti-aktiviti yang melibatkan Seksyen Pengawasan dan Data Kualiti Air Sungai adalah seperti di **Jadual 4.14**.

Permohonan Data Kualiti Air Sungai

Data-data kualiti air sungai telah dipohon oleh tiga kategori pengguna iaitu agensi/jabatan kerajaan, penuntut institusi pengajian tinggi, dan perunding yang menjalankan projek-projek kerajaan. Dalam tahun 2011, permohonan terbanyak yang diterima adalah daripada penuntut institusi pengajian tinggi (68%), diikuti oleh perunding (21%) dan permohonan daripada agensi kerajaan (11%) seperti **Rajah 4.11**.

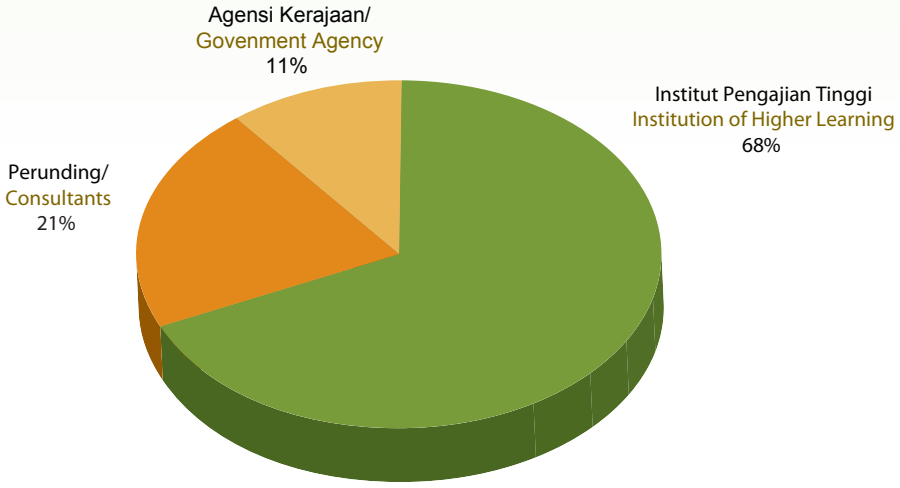
River Water Quality Monitoring Audit

In November 2011, an audit program on river water quality monitoring has been conducted at MWQM station in Sg. Rajang and Sg. Salim in Sarawak. The purpose of the audit was to asses sampling procedure such as sampling technique, usage, maintenance, calibration of water quality sampling and monitoring equipment and tools carried out by contractors.

Other activities which involved River Monitoring and Data section are shown in **Table 4.14**.

Request for River Water Quality Data

Students from higher learning institutions; government appointed consultants as well as government agencies had requested the water quality data. In 2011, the most number of applications received were from higher institution students (68%), followed by government-appointed consultants (21%) and government agencies (11%) as shown in **Figure 4.11**.



Rajah 4.11 JAS: Pecahan Bilangan Permohonan Data Air Sungai, 2001
Figure 4.11 DOE: River Water Quality Data Application, 2011

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
PERLIS	01	PERLIS	6	JARUM	1
				JERNIH	1
				NGULANG	1
				PELARIT	1
				PERLIS	1
				WANG KELIAN	1
KEDAH	01PLA	KISAP	1	KISAP	1
	01PLC	MELAKA	2	PETANG	1
				ULU MELAKA	1
	03	KEDAH	8	JANING	1
				KEDAH	1
				PDG TERAP	3
				PEDU	1
				PENDANG	1
				TEKAI	1
	04	MERBOK	5	BONGKOK	1
				MERBOK	1
				PETANI	1
				TOK PAWANG	1
				TUPAH	1
KEDAH/ P. PINANG	05	MUDA	11	CHEPIR	1
				JERUNG	1
				KARANGAN	1
				KETIL	2
				MUDA	4
				PEGANG	1
				SEDIM	1
P. PINANG	06J	JURU	8	JURU	2
				KILANG UBI	4
				PASIR	1
				RAMBAI	1
P. PINANG/ KEDAH	06P	PERAI	11	JARAK	3
				KARANGAN	1
				KELADI	1
				KEREH	2
				KULIM	1
				PERAI	2
				PERTAMA	1
P. PINANG	06K	KLUANG	3	ARA	2
				RELAU	1
	06PP	PINANG	9	AIR ITAM	5
				AIR TERJUN	1
				DONDANG	1
				JELUTONG	1
				PINANG	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
	06PBL	BAYAN LEPAS	3	BAYAN LEPAS	1
				TIRAM	2
	07	JAWI	3	JAWI	1
				JUNJUNG	1
				MACHANG BUBOK	1
P. PINANG/ PERAK	08	KERIAN	7	KECHIL	1
				KERIAN	4
				SELAMA	2
PERAK	09	KURAU	6	ARA	1
				KURAU	5
	10	SEPETANG	10	BATU TEGOH	3
				JANA	1
				LIMAU	1
				SEPETANG	2
				TEMERLOH	2
				TRONG	1
	11	BRUAS	5	BRUAS	3
				DANDANG	1
				ROTAN	1
	12	RAJA HITAM		MANJONG	2
				NYIOR	1
				RAJA HITAM	2
	12W	WANGI	2	DERALIK	1
				WANGI	1
	13	PERAK	44	BATANG PADANG	3
				BIDOR	3
				CHENDERIANG	2
				CHEPOR	1
				KAMPAR	2
				KANGSAR	1
				KEPAYANG	2
				KERDAH	1
				KINTA	6
				KLAH	1
				KUANG	1
				NYAMOK	1
				PARI	1
				PELUS	2
				PERAK	8
				PINJI	2
				RAIA	2
				SELUANG	1
				SEROKAI	1
				SUNGKAI	2
				TUMBOH	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
PERAK/ SELANGOR	14	BERNAM	8	BERNAM	4
				INKI	1
				SLIM	1
				TROLAK	2
SELANGOR	15	TENGI	3	TENGI	3
	16	SELANGOR	9	BATANG KALI	1
				KANCHING	1
				KERLING	1
				SELANGOR	4
				SEMBAH	1
				SERENDAH	1
	17	BULOH	4	BULOH	4
SELANGOR/ WPKL	18	KLANG	14	BATU	3
				GOMBAK	3
				JINJANG	1
				KLANG	6
				KUYOH	1
SELANGOR	19	LANGAT	15	ANAK CHUAU	1
				BATANG NILAI	1
				CHUAU	2
				JIJAN	1
				LANGAT	7
				LUI	1
				PAJAM	1
				SEMENYIH	1
	20	SEPANG	2	SEPANG	2
N. SEMBILAN	21	LINGGI	14	BATANG PENAR	1
				CHEMBONG	1
				KEPAYONG	1
				KUNDUR BESAR	1
				LINGGI	5
				PEDAS	1
				REMBAU	2
				SIMIN	1
				SIPUT	1
MELAKA	22	MELAKA	12	BTG. MELAKA	2
				DURIAN TUNGGAL	1
				KEMUNTING	1
				KERU	1
				MELAKA	5
				REMBIA	1
				TAMPIN	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
MELAKA	23	DUYONG	4	DUYONG	3
				GAPAM	1
	24	KESANG	5	CHOHONG	2
				KESANG	3
	24A	MERLIMAU	2	MERLIMAU	2
	24SM	SRI MELAKA	1	SRI MELAKA	1
JOHOR/ N. SEMBILAN	25	MUAR	15	AIR PANAS	1
				GEMENCHEH	1
				JUASSEH	1
				LABIS	1
				MEDA	1
				MUAR	8
				SARANG BUAYA	1
				SEGAMAT	1
JOHOR	26	BATU PAHAT	20	AMRAN	1
				BANTANG	1
				BATU PAHAT	1
				BEKOK	5
				BERLIAN	1
				CHAAH	1
				LENIK	1
				MEREK	1
				MERPO	1
				SEMBERONG	2
				SIMPANG KANAN	2
				SIMPANG KIRI	3
	27A	AIR BALOI	3	AIR BALOI	3
	27B	BENUT	7	BENUT	4
				PARIT HJ. YASSIN	1
				PINGGAN	1
				ULU BENUT	1
	28	SEGGET	5	SEGGET	5
	28A	PONTIAN BESAR	7	AIR HITAM	1
				AYER MERAH	1
				KELAPA SAWIT	1
				PONTIAN BESAR	4
	28B	PONTIAN KECIL	2	PONTIAN KECIL	2
	28C	SKUDAI	11	MELANA	2
				SKUDAI	9
	28D	TEBRAU	10	ANAK TEBRAU	3
				BALA	1
				CAW TEBRAU	1
				PANDAN	1
				PLENTONG	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
				SEBULUNG	1
				TAMPOI	1
				TEBRAU	1
	28E	KEMPAS	2	KEMPAS	2
	28F	DANGA	2	DANGA	2
	28G	RAMBAH	2	RAMBAH	2
	29	JOHOR	34	ANAK SG. SAYONG	1
				BELITONG	1
				BKT. BESAR	1
				CHEMANGAR	1
				JOHOR	5
				LAYANG	1
				LAYAU KIRI	1
				LEBAM	1
				LINGGIU	1
				PANTI	1
				PAPAN	1
				PELEPAH	1
				PENGGELI	1
				REMIS	1
				SANTI	1
				SAYONG	5
				SEBOL	1
				SELUYUT	1
				SEMANGAR	1
				SEMENCHU	1
				TELOR	1
				TEMOH	1
				TIRAM	4
	29B	KAW. PASIR GUDANG	5	BULUH	1
				LATOH	1
				MASAI	1
				PEREMBI	1
				TUKANG BATU	1
	29C	SANGLANG	1	SANGLANG	1
	30	PULAI	3	CHOH	1
				PULAI	2
	30A	SEDILI BESAR	9	AMBAT	1
				DOHOL	1
				MUPUR	1
				SEDILI BESAR	5
				TEMUBOR KANAN	1
	30B	SEDILI KECIL	5	ANAK SEDILI KECIL	1
				BAHAN	2
				SEDILI KECIL	2

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
	30C	PALOI	1	PALOI	1
	31A	MERSING	2	MERSING	2
	31B	JEMALUANG	2	JEMALUANG	2
	31C	KIM-KIM	2	KIM-KIM	2
	32	ENDAU	22	ENDAU	2
				JASIN	1
				JEBONG	1
				KAHANG	1
				LENGGOR	1
				MAMAI	1
				MELATAI	1
				MENGKIBOL	3
				PALOH	1
				PAMOL	1
				SELAI	1
				SEMBERONG	6
				SINGOL	1
				TAMOK	1
PAHANG	32AE	ANAK ENDAU	2	ANAK ENDAU	2
	33	ROMPIN	9	AUR	1
				KERATONG	2
				PONTIAN	1
				PUKIN	1
				ROMPIN	4
	34B	BEBAR	4	BEBAR	1
				MERBA	1
				SERAI	2
	34M	MERCHONG	1	MERCHONG	1
	35P	PAHANG	67	BENTONG	1
				BENUS	2
				BERA	2
				BERKAPOR	1
				BERTAM	1
				BURUNG	1
				CHINI	1
				HABU	1
				JELAI	2
				JEMPOL	2
				JENGKA	2
				KELAU	1
				KERTAM	1
				KOYAN	1
				KUNDANG	1
				LENGGOK	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
				LEPAR	3
				LIPIS	3
				LUIT	1
				MARAN	1
				MENTIGA	1
				PAHANG	8
				PERTING	1
				RINGLET	1
				SEMANTAN	4
				SERTING	2
				T. PAYA BUNGOR	1
				TAHAN	1
				TANGLIR	1
				TASIK BERA	1
				TASIK CHINI	1
				TEKAL	1
				TEKAM	2
				TELANG	1
				TELOM	2
				TEMBELING	1
				TERANUM	1
				TERAS	1
				TERLA	1
				TRIANG	2
				TERIS	3
				TRINGKAP	1
	36	KUANTAN	11	BELAT	1
				CHARU	1
				KENAU	1
				KUANTAN	5
				PANDAN	1
				REMAN	1
				RIAU	1
	37	BALOK	3	BALOK	2
				PANJANG	1
	37A	CHERATING	1	CHERATING	1
	37B	TONGGOK	1	TONGGOK	1
TERENGGANU	38	KEMAMAN	4	CHERUL	1
				KEMAMAN	2
				RANSAN	1
	39C	CHUKAI	4	BUNGKUS	1
				CHUKAI	1
				IBOK	1
				RUANG	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
	39K	KERTIH	1	KERTIH	1
	40	PAKA	2	PAKA	1
				RASAU	1
	41	DUNGUN	4	DUNGUN	4
	42I	IBAI	3	IBAI	3
	42L	MERCHANG	1	MERCHANG	1
	42M	MARANG	1	MARANG	1
	43	TERENGGANU	7	BERANG	1
				NERUS	1
				PUEH	1
				TELEMONG	1
				TERENGGANU	3
	44	SETIU	4	SETIU	2
				CHALOK	2
	45	MERANG	1	MERANG	1
	46	BESUT	2	BESUT	2
	47	KLUANG	1	KLUANG	1
KELANTAN	47K	KEMASIN	4	KEMASIN	2
				SEMERAK	2
	48	KELANTAN	33	BELATOP	2
				BER	1
				BEROK	3
				BETIS	1
				GALAS	5
				KELANTAN	3
				KERILLA	1
				LEBIR	3
				NAL	2
				NENGGIRI	3
				PERGAU	6
				RELAI	1
				SOKOR	1
				TUANG	1
	48C	PENGKALAN CHEPA	6	ALOR B	1
				ALOR LINTAH	1
				KELADI	1
				PENGKALAN CHEPA	3
	48D	PENGKALAN DATU	3	PENGKALAN DATU	3
	49	GOLOK	6	GOLOK	5
				LANAS	1
SARAWAK	50	KAYAN	3	KAYAN	3
	50S	SEMUNSAM	1	SEMUNSAM	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
	51	SARAWAK	15	KUAP	1
				MAONG KIRI	1
				SARAWAK	5
				SARAWAK KANAN	2
				SARAWAK KIRI	1
				SEMADANG	1
				SEMENGGOH	1
				TABUAN	1
				SAMARAHAN	2
	52	SADONG	6	KARANGAN	2
				SADONG	4
	53	LUPAR	8	AI	2
				LUPAR	3
				SEKERANG	1
				SETERAP	1
				UNDUP	1
	54	SARIBAS	3	LAYAR	2
				SARIBAS	1
	55	KERIAN	3	KERIAN	2
				SEBLAK	1
	56	RAJANG	19	BALOI	1
				BINATANG	1
				JULAU	1
				KANOWIT	1
				MERADONG	1
				RAJANG	12
				SALIM	1
				SARIKEI	1
	57	OYA	3	OYA	3
	58	MUKAH	4	MUKAH	4
	59	BALINGIAN	2	BALINGIAN	2
	60	TATAU	1	TATAU	1
	61	KEMENA	4	KEMENA	3
				SIBIU	1
	62	SIMILAJAU	2	SIMILAJAU	2
	63	SUAI	1	SUAI	1
	64	NIAH	3	NIAH	2
				SEKALOH	1
	65	SIBUTI	6	KABULOH	2
				KEJAPIL	1
				SATAP	1
				SIBUTI	2

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
	66	MIRI	6	ADONG	1
				DALAM	1
				LUTONG	1
				MIRI	2
				PADANG LIKU	1
	67	BARAM	5	BARAM	4
				TUTOH	1
	68	LIMBANG	5	LIMBANG	5
	69	TRUSAN	1	TRUSAN	1
	70	LAWAS	3	LAWAS	3
SABAH	71	MENGGALONG	2	MENGGALONG	2
	71A	LAKUTAN	1	LAKUTAN	1
	71B	LINGKUNGAN	2	BUKAU	1
				LINGKUNGAN	1
	72	PADAS	10	ANSIP	1
				BUNSIT	1
				LIAWAN	1
				PADAS	3
				PANGATAN	1
				PEGALAN	2
				TANDULU	1
	73	MEMBAKUT	1	MEMBAKUT	1
	74A	BONGAWAN	1	BONGAWAN	1
	74	KIMANIS	1	KIMANIS	1
	75	PAPAR	3	PAPAR	3
	76	MOYOG	4	MOYOG	4
	76A	SEMBULAN	2	SEMBULAN	2
	76B 76	LIKAS	7	INANAM	3
				LIKAS	2
				MENGGATAL	2
	76C	TELIPOK	2	TELIPOK	2
	77	TUARAN	5	DAMIT	2
				SONG SAI	1
				TUARAN	2
	78	KEDAMAIAN	4	KEDAMAIAN	1
				TEMPASUK	2
				WARIU	1
	78T	TENGHILAN	1	TENGHILAN	1
	79	BINGKONGAN	6	BANDAU	1
				BINGKONGAN	2
				MENGGARIS	2
				TANDEK	1
	80	BENGKOKA	2	BENGKOKA	2
	82	PAITAN	1	PAITAN	1

Jadual 4.12 JAS: Senarai Lembangan Sungai dan Sungai-Sungai yang Dipantau, 2011 (sambungan)
Table 4.12 DOE: List of the River Catchment And River Monitored, 2011 (continued)

Negeri / State	Kod WKA / Code WQR	Lembangan Sungai / River Basin	Bil. Stesen / No. of Stations	Sungai Diawasi / Rivers Monitored	Bil. Stesen / No. of Stations
	83	SUGUT	6	BONGKUD	1
				LOHAN	1
				MERALI	1
				SUGUT	3
	84	LABOK	7	KINIPIR	2
				LABOK	1
				LIWAGU	2
				MALIAU	1
				TUNGUD	1
	84A	SAPI	4	SAPI	3
				SUALONG	1
	85	MOUNAD	2	MOUNAD	2
	85A	SEGALIUD	2	SEGALIUD	2
	86	KINABATANGAN	6	KARAMUAK	1
				KINABATANGAN	3
				KOYAH	1
				MENANGGUL	1
	87	SEGAMA	3	SEGAMA	3
	88	TUNGKU	2	TUNGKU	2
	88A	SILABUKAN	2	SILABUKAN	2
	89	TINGKAYU	2	TINGKAYU	2
	90	KALUMPANG	3	KALUMPANG	3
	91A	APAS	1	APAS	1
	91B	BALUNG	1	BALUNG	1
	91	TAWAU	4	TAWAU	4
	92	MEROTAI	3	MEROTAI	3
	93	UMAS-UMAS	1	UMAS-UMAS	1
	94	BRANTIAN	1	BRANTIAN	1
	95	KALABAKAN	3	KALABAKAN	3
	JUMLAH/ TOTAL				**812**

Jadual 4.13 JAS: Parameter-Parameter Pengukuran Kualiti Air Sungai
Table 4.13 DOE: River Water Quality Parameters

Parameter	Unit
DO	mg/l, % saturated
BOD	mg/l
COD	mg/l
SS	mg/l
pH	unit
NH_3-N	mg/l
Suhu / Temperature	°C
Konduktiviti/ Conductivity	uS
Kemasinan / Salinity	ppt
Kekeruhan / Turbidity	NTU
Pepejal terlarut / Dissolved solids	mg/l
Nitrat, NO_3	mg/l
Cl	mg/l
PO_4	mg/l
As	mg/l

Parameter	Unit
Hg	mg/l
Cd	mg/l
Cr	mg/l
Pb	mg/l
Zn	mg/l
Ca	mg/l
Fe	mg/l
K	mg/l
Mg	mg/l
Na	mg/l
Minyak dan Gris/ Oil and Gris	mg/l
Methylene Blue Active Substances (MBAS)	mg/l
E-coli	cfu/100ml
Total Coliform	cfu/100ml

Jadual 4.14 JAS: Aktiviti Program Pengawasan Kualiti Air Daratan, 2011
Table 4.14 DOE: Activities Surface Water Quality Monitoring Programme, 2011

Tarikh / Date	Aktiviti & Program / Activities & Programmes	Tempat / Venue
16 Februari / February 2011	Mesyuarat Jambori River Ranger Malaysia 2011 Bil 1/2011	Jabatan Pengairan dan Saliran Malaysia
25 Februari / February 2011	Mesyuarat Pasukan Petugas ROL Bil 2/2011	Jabatan Pengairan dan Saliran Malaysia
24 Mac / March 2011	Mesyuarat Pembinaan Pemantauan Stesen Kualiti Air ROL	Jabatan Pengairan dan Saliran Selangor
12 April / April 2011	Majlis Pelancaran Greater KL/KV 'River of Life'	Hotel Hilton, KL
21 April / April 2011	Mesyuarat Pasukan Petugas ROL Bil 4/2011	Pejabat Tapak Ekovest-MRCB, Gombak
9 Mei / May 2011	Mesyuarat Jawatankuasa Teknikal Program Satu Negeri Satu Sungai Bil 1/2011	Tower Regency Hotel, Ipoh, Perak
18 Mei / May 2011	Mesyuarat Khas Untuk Membincangkan Standard Pelepasan Efluen dari Loji Rawatan Kumbahan Bagi Perlaksanaan Projek ROL	Jabatan Perkhidmatan Pembentungan, Pusat Bandar Damansara KL
2 Jun / June 2011	Mesyuarat Pasukan Petugas ROL Bil 5/2011	Pejabat Tapak Ekovest-MRCB, Gombak
22 Jun / June 2011	Jemputan Menjadi Ahli-Ahli Jawatankuasa Teknikal dan Mesyuarat Membincangkan Laporan "Inception' ROL	Pejabat Tapak Ekovest-MRCB, Gombak
24 Jun / June 2011	Mesyuarat Pasukan Petugas ROL Bil 6/2011	Pejabat Tapak Ekovest-MRCB, Gombak
1 Julai / July 2011	Majlis Pecah Tanah Projek ROL	Lot 497 & 194, Kuala Lumpur
4 Julai / July 2011	Seminar dan Pameran Greater KI/KV ROL	Dewan Perdana Mastika, Institut Latihan Dewan Bandaraya Kuala Lumpur
25 - 29 Julai / July 2011	Bengkel Program Pengawasan Kualiti Air Sungai Malaysia 2011	Heritage Hotel, Ipoh, Perak
11 Ogos / August 2011	Mesyuarat WQI bagi Sungai-Sungai Terpilih	Jabatan Pengairan dan Saliran Malaysia
29 Ogos / August 2011	Mesyuarat Membincangkan Laporan Kajian ROL	Jabatan Pengairan dan Saliran Malaysia
6 September / September 2011	Mesyuarat Petunjuk Prestasi Utama (KPI) Bagi Setiap Projek ROL	Jabatan Pengairan dan Saliran Malaysia

Jadual 4.14 JAS: Aktiviti Program Pengawasan Kualiti Air Daratan, 2011 (sambungan)
Table 4.14 DOE: Activities Surface Water Quality Monitoring Programme, 2011 (continued)

Tarikh / Date	Aktiviti & Program / Activities & Programmes	Tempat / Venue
7 September / September 2011	Mesyuarat Pasukan Petugas ROL Bil 8/2011	Jabatan Pengairan dan Saliran Malaysia
8 September / September 2011	Mesyuarat Jawatankuasa Teknikal Program Satu Negeri Satu Sungai Bil 2/2011	Jabatan Pengairan dan Saliran Malaysia
27 September / September 2011	Mesyuarat Pasukan Petugas ROL Bil 9/2011	Jabatan Pengairan dan Saliran Malaysia
18 Oktober / October 2011	Mesyuarat Pasukan Petugas ROL Bil 10/2011	Jabatan Pengairan dan Saliran Malaysia
8 -10 November 2011	Audit Persampelan dan Stesen Pengawasan Manual Kualiti Air Sungai, 2011	Sg. Rajang dan Sg. Salim, Sibu, Sarawak.
22 November / November 2011	Mesyuarat Pasukan Petugas ROL Bil 11/2011	Jabatan Pengairan dan Saliran Malaysia
13 Disember / December 2011	Mesyuarat ROL Peringkat JAS KL	Jabatan Alam Sekitar Kuala Lumpur
20 Disember / December 2011	Lawatan Tapak 'Entry Point' Projek ROL	Menara 1 Dewan Bandaraya Kuala Lumpur
21 Disember / December 2011	Mesyuarat Jawatankuasa Teknikal Program Satu Negeri Satu Sungai Bil 3/2011	Jabatan Pengairan dan Saliran Malaysia
22 Disember / December 2011	Mesyuarat Bagi Membincangkan Koordinasi Peranan dan Tindakan JAS Untuk Inisiatif 11 ROL	Jabatan Alam Sekitar Ibu Pejabat, Putrajaya
24 - 29 Disember / December 2011	Ekspedisi Sungai Teris	Sungai Teris, Pahang

PEMANTAUAN KUALITI AIR TANAH
GROUNDWATER MONITORING

Stesen-stesen pemantauan kualiti air tanah diwujudkan untuk:

1. Menilai status kualiti air tanah secara berkala di kawasan terpilih dengan frekuensi minimum empat (4) kali setahun;
2. Menilai kesan aktiviti gunatanah terhadap air tanah sekitarnya;
3. Membangunkan rangkaian pemantauan kualiti air tanah yang komprehensif; dan
4. Mengenalpasti lokasi bagi air tanah yang mempunyai risiko tinggi kepada pencemaran oleh aktiviti manusia.

Kriteria asas pemilihan rangkaian stesen adalah:

1. Pengumpulan maklumat dan data kajian semasa kerja-kerja awal pembinaan;
2. Serakan pemilihan tapak adalah mengikut kategori gunatanah dan pencemaran yang berlaku;
3. Mengikut darjah dan tahap pencemaran sesuatu tapak kepada orang awam, alam sekitar dan penggunaannya; dan
4. Terletak di dalam kedudukan dan jajaran terbesar akuifer di keseluruhan kawasan di Malaysia. (**Rajah 4.12**)

Monitoring wells had been constructed for the following purposes:

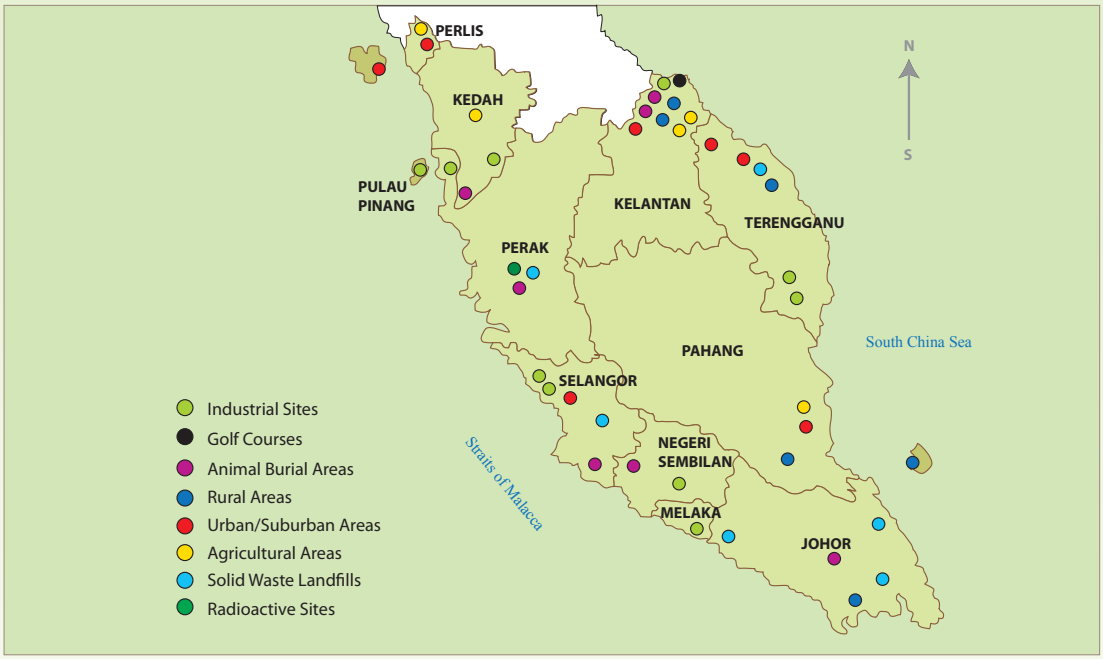
1. Continued monitoring of groundwater quality at selected sites at a minimum frequency of four (4) times per year;
2. Reviewing and evaluating the impact of pollution based on land use activity affecting surrounding groundwater;
3. Developing a comprehensive groundwater monitoring network for assessing groundwater quality; and
4. Identifying potential pollution sources caused by human activity which may have adverse impact to the groundwater quality.

The monitoring network were selected based on:

1. Information collected from site visits;
2. Distribution of the sites according to the site category which is influenced by the source of pollution and land use;
3. Degree or danger level of contamination of each site to the public, environment and downstream users; and
4. Distribution of the sites among the major aquifers in Malaysia. (**Figure 4.12**)

Telaga pemantauan kualiti air tanah kebangsaan
The national quality groundwater monitoring wells

Kerja-kerja persampelan air di lapangan sedang dijalankan
The water quality sampling carried out at site



Rajah 4.12 JAS: Peta kedudukan stesen air tanah di Semenanjung Malaysia.
Figure 4.12 DOE: The distribution map of groundwater stations in Peninsular Malaysia

Pada tahun 2011, sebanyak 224 sampel daripada 109 buah telaga pemantauan kualiti air tanah di seluruh Malaysia telah dianalisa. Telaga ini dibina di kawasan-kawasan mengikut kategori gunatanah iaitu pertanian, perindustrian, padang golf, tapak pelupusan sampah, tapak pelupusan bangkai haiwan, kawasan bekalan air, bekas tapak perlombongan, perbandaran dan luar bandar di seluruh Malaysia (**Jadual 4.15**).

In 2011, 224 groundwater samples were drawn on a quarterly basis from 109 monitoring wells in Malaysia for analysis. The wells had been constructed in areas categorized according to land use which are agriculture, industrial, golf course, solid waste landfill, animal burial, municipal water supply, ex-mining (gold mine) and urban/suburban areas (**Table 4.15**).

Jadual 4.15 JAS: Bilangan Stesen Air Tanah Mengikut Kategori Guna Tanah, 2011
Table 4.15 DOE: Number of Groundwater Stations by Land Use Category, 2011

Kategori / Category	Bilangan Telaga / Number of Wells
Kawasan Pertanian / Agricultural Areas	12
Bandar & Pinggir Bandar / Urban & Suburban Areas	11
Tapak Perindustrian / Industrial Sites	18
Tapak Pelupusan Sampah / Landfills	24
Padang Golf / Golf Courses	7
Luar Bandar / Rural Areas	3
Bekas lombong / Ex- Mining	3
Bekalan Air Tempatan / Municipal Water Supply	9
Tapak Pelupusan Bangkai Haiwan/ Animal Burial	14
Kolam Akuakultur / Aquaculture Farms	6
Tapak Pelupusan Radioaktif / Radioactive Landfill	1
Peranginan / Resorts	1
Jumlah / Total	**109**

Pengukuran parameter-parameter fizikal kualiti air tanah dibuat secara in-situ manakala parameter kimia dan biologi dianalisis di makmal. Parameter in-situ yang diukur adalah suhu, pH, konduktiviti, kekeruhan, kemasinan dan oksigen terlarut. Parameter yang dianalisis di makmal pula ialah bahan kimia organik meruap (VOC), hidrokarbon, racun perosak, logam berat, anion, bakteria, sebatian berfenol, radioaktif, jumlah keliatan dan jumlah pepejal terlarut.

Di antara aktiviti-aktiviti lain yang dilaksanakan oleh Bahagian Air dan Marin pada tahun 2011 adalah seperti berikut;

1. Satu lawatan audit di JAS Negeri Pahang telah dijalankan pada 20-21 April 2011 bagi menyemak laporan penyelenggaraan luaran telaga yang telah dibuat melalui peruntukan yang telah disalurkan pada tahun 2010.
2. Satu lawatan di JAS Negeri Perak telah dilakukan pada 30-31 Mei 2011 bagi menilai prestasi telaga air tanah di Tambun dan juga memantau cara kerja/kaedah persampelan yang telah dijalankan di telaga air tanah di Batu Gajah.
3. Tiga (3) lawatan pemeriksaan luaran telaga air tanah mengikut zon telah dijalankan seperti berikut:

    i. Zon utara pada 5-8 Disember 2011 – 18 buah telaga
    ii. Zon selatan pada 15-16 Disember 2011 – 9 buah telaga
    iii. Zon timur pada 27-29 Disember 2011 – 37 buah telaga

Peralatan yang digunakan termasuklah:

i. Pam 'hydrolift'
ii. Tiub hdpe
iii. Alat ukur kedalaman air
iv. Set Generator
v. Botol persampelan/Larutan pengawetan-alat ujian
vi. Kotak kedap ais
vii. Multiprob

Samples for in-situ measurement and samples for laboratory analysis were collected at each station. In-situ parameters were temperature, pH, conductivity, turbidity, salinity and dissolved oxygen. For laboratory analysis, the parameters were total volatile organic compounds (VOCs), hydrocarbons, pesticides, heavy metals, anions, bacteria, phenolic compounds, radioactivity, total hardness and total dissolved solids

Among other activities carried out by the Marine and Water Division in 2011 were;

1. Site visit audit at DOE Pahang on 20-21 April 2011 to review the work progress on the maintenance of wells.
2. Site visit at DOE Perak from 30-31 May 2011 to assess the performance of monitoring wells in Tambun and the procedure of water quality sampling at the monitoring well site in Batu Gajah.
3. Three (3) sites inspection visits on the wells based on zones had been conducted as follow:

    i. Northern zone on 5-8 December 2011 – 18 wells
    ii. Southern zone on 15-16 December 2011 – 9 wells
    iii. Eastern zone on 27-29 December 2011 – 37 wells

The equipments used at site are:

i. Hydrolift pump
ii. Hdpe tube
iii. Water depth sensor
iv. Generator set
v. Sampling bottle/ Preservative kit
vi. Coolbox
vii. Multiprobe

RANCANGAN KONTINGENSI KEBANGSAAN KAWALAN TUMPAHAN MINYAK (RKKKTM)
NATIONAL OIL SPILL CONTINGENCY PLAN (NOSCP)

RKKKTM ditadbir oleh Jawatankuasa Kebangsaan Kawalan Tumpahan Minyak (JKKTM) yang dianggotai oleh 18 Jabatan dan Agensi, dipengerusikan oleh Ketua Pengarah Alam Sekitar Malaysia. Di samping itu, peralatan mengawal tumpahan minyak turut ditempatkan di lokasi-lokasi strategik seperti di **Rajah 4.13**. JAS juga memberi penekanan terhadap latihan-latihan berstruktur dan berkala bagi semua kakitangan yang terlibat dengan Oil Spill Response (OSR) dalam tindakbalas Kawalan Tumpahan Minyak (KTM). Latihan-latihan berkenaan adalah bagi memastikan semua kakitangan JAS dan agensi-agensi yang akan terlibat dalam KTM dibekalkan dengan pengetahuan dan kemahiran yang mencukupi dalam pengendalian peralatan dan pengurusan krisis. *Resolusi 7 International Convention on Oil Spill Preparedness and Response (OPRC) 1990* telah menggariskan komitmen di peringkat Antarabangsa dalam hal-ehwal berhubung dengan latihan. Keperluan latihan ini telah dimasukkan ke dalam mekanisma tindakbalas RKKKTM.

The NOSCP is administered by the National Oil Spill Control Committee (NOSCC) consisting of 18 member departments and agencies, and chaired by the Director General of Department of Environment Malaysia (DOE). Oil Spill Response Equipment (OSRE) bases are positioned at strategic locations as shown in **Figure 4.13.** DOE places equal emphasis on scheduled and periodical training activities for personnel involved in Oil Spill Response (OSR). Such training is aimed to ensure DOE officers involved in OSR are well equipped with necessary knowledge and skills in equipment handling and crisis management. Resolution 7 of the International Convention on Oil Spill Preparedness and Response (OPRC) 1990 provides for an International Commitment to training and preparedness. This preparedness and training requirement has been incorporated into NOSCP response system.

Pada tahun 2011, 10 kursus dan latihan yang berkaitan dengan latihan tumpahan minyak telah dianjurkan bagi meningkatkan pengetahuan dan kemahiran melawan tumpahan minyak.

In 2011, a total of 10 courses and trainings related to oil spill were organized to enhance the knowledge and skills of agencies to combat oil spills.

Antara kursus dan latihan tersebut ialah:

Courses and trainings are as follow:

i. Latihan Pembersihan Pantai di lapan (8) buah negeri.

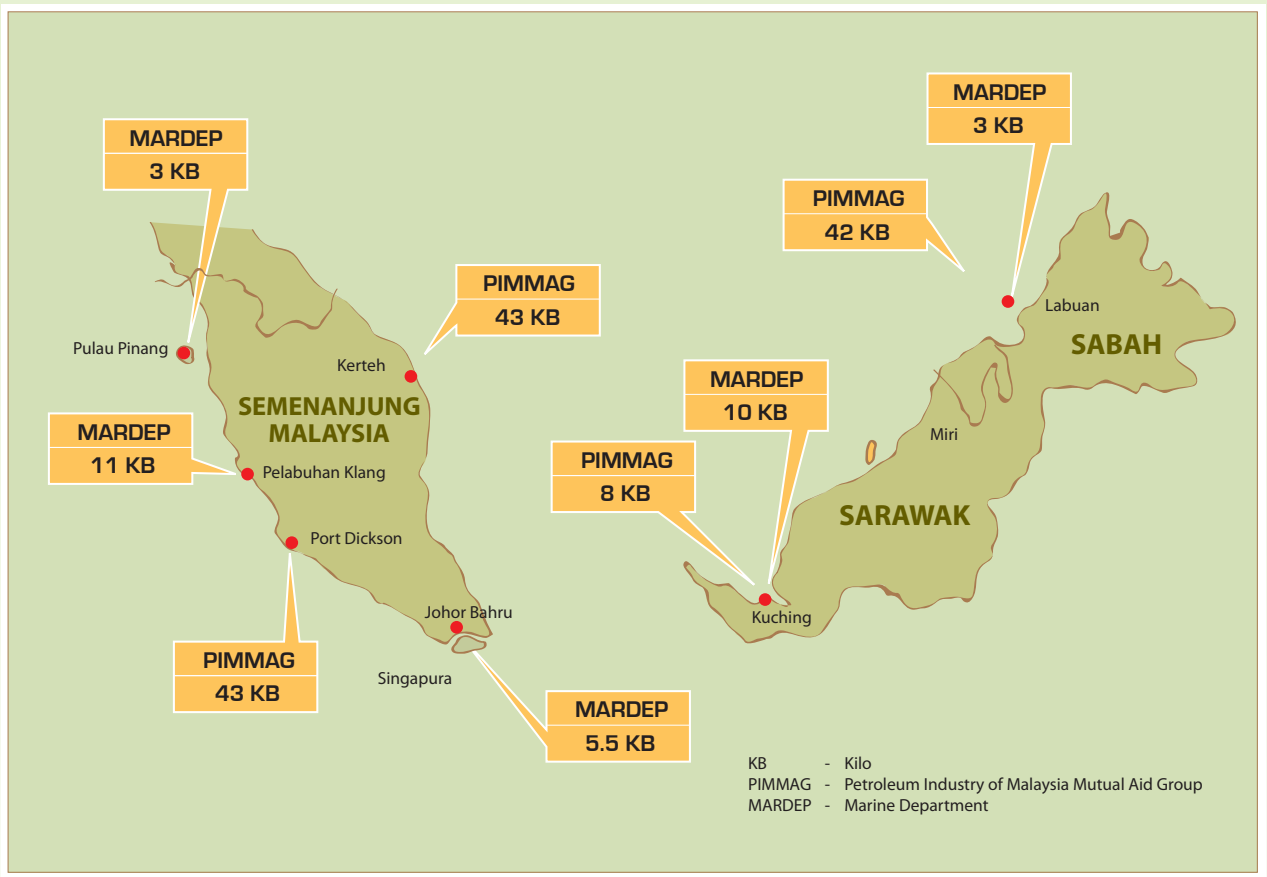
i. Beach Clean-Up Exercise in eight (8) states.

ii. *International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) International Maritime Organization (IMO) Level 2 Oil Spill Response.*

ii. International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) International Maritime Organization (IMO) Level 2 Oil Spill Response.

iii. *IPIECA,Workshop On Dispersant And Their Role In Oil Spill Response.*

iii. IPIECA, Workshop On Dispersant And Their Role In Oil Spill Response.



Rajah 4.13: Lokasi Peralatan Melawan Tumpahan Minyak Dan Keupayaan Di Malaysia
Figure 4.13: Location of Oil Spill Equipment Stockpile And Capability In Malaysia

Program Latihan Tumpahan Minyak dan Tindakan Pembersihan Pantai di Melaka pada 5 hingga 6 Januari 2011
Oil Spill and Beach Clean-Up Programme in Malacca on 5th to 6th Januari 2011

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

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

The RFC Fund was established on 11 February 1981 for the purpose of combating oil spills from vessels passing through the Straits of Malacca and Singapore.

Pengurusan Tabung ini adalah secara bergilir-gilir di kalangan tiga (3) buah negara iaitu Malaysia, Singapura dan Indonesia bagi tempoh lima (5) tahun setiap giliran. Pada tahun 2011 tabung tersebut diuruskan oleh Indonesia.

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

Pantai yang indah dan bersih
Nice, clean beach

PENCEMARAN MARIN
MARINE POLLUTION

Sepanjang tahun 2011, sejumlah 14 kes aduan pencemaran tumpahan minyak yang diterima iaitu enam (6) kes berlaku di Laut China Selatan, tujuh (7) kes dikesan di Selat Melaka dan satu (1) kes di Selat Johor (**Jadual 4.16**).

Daripada 14 jumlah kes tumpahan minyak yang berlaku pada tahun 2011 satu (1) kes adalah berpunca dari pelantar minyak, empat (4) kes dari kapal, dua (2) kes dari kilang dan tujuh (7) kes tidak diketahui punca.

Throughout 2011, there were 14 cases of marine pollution from oil spills were reported; six (6) cases in the South China Sea, seven (7) in the Straits of Malacca and one (1) in the Johor Straits (**Table 4.16**).

Out of 14 cases of oil spill in 2011 the sources are from oil rig (1 case), ships (4 cases), factory (2 cases) and other unknown source (7 cases).

Jadual 4.16 JAS: Kejadian Pencemaran Minyak, 2011
Table 4.16 DOE: Oil Spill Incidents, 2011

Lokasi / Location	Kawasan / Area		Bil. Kes / No. of Cases	Negeri / State
Laut China Selatan / South China Sea	Perairan Malaysia Malaysia Territory	Semenanjung / Peninsular	5	Terengganu (3) Pahang (2)
		Malaysia Timur / East Malaysia	0	-
	Zon Ekonomi Eksklusif (ZEE)/ Exclusive Economic Zone (EEZ)		1	WP Labuan
Laut Sulu / Sulu Sea	Perairan Malaysia Malaysia Territory	Sabah	0	-
Selat Melaka / Straits of Malacca	Perairan Malaysia Malaysia Territory		7	Selangor (1) Negeri Sembilan (1) Melaka (2); Johor (2) P. Pinang (1)
	Zon Ekonomi Eksklusif (ZEE)/ Exclusive Economic Zone (EEZ)		0	-
Selat Johor Straits of Johor	Perairan Malaysia Malaysia Territory	Bahagian Barat/ West Part	0	-
		Bahagian Timur / East Part	1	Johor
Jumlah / Total			**14**	

PENGURUSAN BUANGAN TERJADUAL
SCHEDULED WASTES MANAGEMENT

Kebenaran Bertulis dan Lesen Premis Yang Ditetapkan

Sebanyak 45 Kebenaran Bertulis telah dikeluarkan oleh Ketua Pengarah Alam Sekeliling untuk pembinaan kemudahan pengolahan dan pelupusan buangan terjadual pada tahun 2011. Kebenaran Bertulis yang telah dikeluarkan adalah mengikut kategori premis seperti berikut:

- 20 kemudahan pemerolehan kembali buangan terjadual (selain dari e-waste);
- 18 kemudahan pemerolehan kembali buangan e-waste. Dari jumlah tersebut, 17 merupakan kemudahan pemerolehan kembali luar tapak separa *e-waste* dan satu (1) kemudahan pemerolehan kembali luar tapak penuh *e-waste*;
- Enam (6) kemudahan penstoran luar tapak; dan
- Satu (1) kemudahan pengolahan tapak pelupusan selamat (**Jadual 4.17**).

Di samping itu, sejumlah 743 lesen dikeluarkan kepada kemudahan baru dan kemudahan sediada pada tahun 2011. Lesen yang telah dikeluarkan adalah mengikut kategori premis seperti berikut:

- 159 kemudahan pemerolehan kembali buangan terjadual (selain dari *e-waste*);
- 158 kemudahan pemerolehan kembali buangan e-waste. Dari jumlah ini 135 merupakan kemudahan pemerolehan kembali luar tapak separa buangan *e-waste* dan 23 kemudahan pemerolehan kembali luar tapak penuh *e-waste*;
- 37 kemudahan penunu buangan terjadual;
- Dua (2) kemudahan pengolahan di tanah;
- Empat (4) kemudahan pengolahan luar tapak;
- Enam (6) kemudahan tapak pelupusan selamat;
- 343 kemudahan penstoran luar tapak (pengangkutan); dan
- 34 kemudahan penstoran luar tapak (**Jadual 4.18**).

Written Permission and Licences for Prescribed Premises

Fourty five (45) Written Permissions were issued by the Director General of Environment in 2011 for the construction of treatment and disposal facility for scheduled wastes. Written Permissions were issued according to the following categories of premises:

- 20 off-site recovery facilities (apart from e-waste);
- 18 off-site e-waste recovery facilities. Of this number, 17 are off-site e-waste partial recovery facilities and one (1) off-site e-waste full recovery facility;
- Six (6) off-site storage facilities; and
- One (1) secured landfill (**Table 4.17**).

In addition, a total of 743 licences were issued for both existing and new facilities in 2011. Licences were issued according to the following categories of premises:

- 159 licences for off-site recovery facilities (apart from e-waste);
- 158 licences for off-site e-waste recovery facilities. Of this number, 135 are off-site e-waste partial recovery facilities and 23 off-site e-waste full recovery facilities;
- 37 licences for scheduled wastes incinerators;
- Two (2) licences for land treatment facilities;
- Four (4) licences for off-site treatment;
- Six (6) licences for secured landfills;
- 343 licences for off-site storage-transportation; and
- 34 licences for off-site storage facilities (**Table 4.18**)

Jadual 4.17 JAS: Permohonan Kebenaran Bertulis (KB) Bagi JAS Negeri Kemudahan Pengolahan & Pelupusan Buangan Terjadual, 2011
Table 4.17 DOE: Writtten Permission Issued By DOE State for Scheduled Waste Treatment and Disposal Facility, 2011

Bil./ No.	Kemudahan / Facilities	Negeri / State															Jumlah / Total
		JHR	KDH	KLN	MLK	N.S	PHG	PRK	PRS	PP	SBH	SRK	SLG	TRG	WP (KL)	WP (LAB)	
1	Insinerator Buangan Terjadual/ Scheduled Waste Incinerator																0
2	Kemudahan Pemerolehan Kembali Luar Tapak/ Off Site Recovery Facilities																
	a. Pemerolehan Kembali luar tapak bukan e-Waste / Off Site Recovery none e-waste	3	3		1	3		1		2		1	5				20
	b. Pemerolehan Kembali Penuh e-Waste / Full Off Site Recovery e-Waste												1				1
	c. Pemerolehan Kembali Separa e-Waste / Partial Recovery e-Waste	3	1				1			5		2	5				17
3	Kemudahan Penstoran Luar Tapak / Off Site Storage Facitities											6					6
4	Kemudahan Pengolahan Luar Tapak / Off site Treatment Facilities																
	a. Loji rawatan Fizikal &Kimia / Chemical & Physical Treatment																0
	b. Loji Solidifikasi / Solidification Plant																0
	c. Loji Rawatan Air Resapan / Diffusion Water Treatment Plant																0
5	Kemudahan Pengolahan Di Tanah / Land Treatment Facility																0
6	Tapak Pelupusan Selamat / Secured Landfill										1						1
	Bil. KB Yang Dikeluarkan / No. of Writen Permision	6	4	0	1	3	1	1	0	7	1	9	11	0	0	0	45

Jadual 4.18 JAS: Lesen-Lesen Yang Dikeluarkan Bagi Kemudahan Pengolahan & Pelupusan Buangan Terjadual, 2011

Table 4.18 DOE: Licensed Scheduled Waste Treatment and Disposal Facilities, 2011

Bil./ No.	Kemudahan / Facilities	Negeri / State															Jumlah / Total
		JHR	KDH	KLN	MLK	N.S	PHG	PRK	PRS	PP	SBH	SRK	SLG	TRG	WP (KL)	WP (LAB)	
1	Penstoran Luar Tapak - Pengangkutan / Off Site Storage-Transportion	59	19		22	12	7	26	1	62	7	34	77	7	7	3	**343**
	Penstoran Luar Tapak / Off Site Storage	2	1			1	3					21	3	1		2	**34**
2	Pemerolehan Kembali Luar Tapak / Off Site Recovery																**0**
	a. Pemerolehan Kembali Luar Tapak bukan e-Waste / Off Site Recovery none e-waste	35	6		2	10	8	25	1	18	1	8	39	6			**159**
	b. Pemerolehan Kembali Luar Tapak Penuh e-Waste / Full Off Site Recovery e-Waste	4	1		4	2				7			5				**23**
	c. Pemerolehan Kembali Separa e-Waste / Partial Recovery e-Waste	18	12		14	4	1	5		39		9	26		7		**135**
3	Penunu Buangan Terjadual / Schedule Waste Incinerator	4	1		2	4		2		3	4	10	4	2		1	**37**
4	Pengolahan Di Tanah / Land Treatment Facilities											1				1	**2**
	Pengolahan Luar Tapak/ Off Site Treatment Facilities					2						2					**4**
5	Tapak Pelupusan Selamat / Secured Landfill		2			2						1		1			**6**
	Bil. Lesen / No. of License	122	42	0	44	37	19	58	2	129	12	86	154	17	14	7	**743**
	Bil. Premis / No. of Premises	59	23	0	22	18	9	30	1	67	10	51	82	9	7	7	**395**

Nota/ Note:

JHR - JOHOR
KDH - KEDAH
KLN - KELANTAN
MLK - MELAKA
N.S - NEGERI SEMBILAN
PRK - PERAK
PRS - PERLIS
PP - PULAU PINANG
PHG - PAHANG
SBH - SABAH
SLG - SELANGOR
SRK - SARAWAK
TRG - TERENGGANU
WP (KL) - WILAYAH PERSEKUTUAN KUALA LUMPUR
WP (LAB) - WILAYAH PERSEKUTUAN LABUAN

SKIM NOTIFIKASI DAN PENDAFTARAN BAHAN-BAHAN BERBAHAYA ALAM SEKELILING (EHSNR)
ENVIRONMENTALLY HAZARDOUS SUBSTANCES NOTIFICATION AND REGISTRATION SCHEME (EHSNR)

Skim Notifikasi dan Pendaftaran Bahan-Bahan Berbahaya Alam Kepada Sekeliling (EHSNR) telah dilancarkan pada 15 Julai 2008 dan berikutan itu satu *on-line system* telah dijalankan secara sukarela sejak Januari 2009.

The Environmentally Hazardous Substances Notification and Registration Scheme (EHSNR) was launched on 15 July 2008 and since January 2009, the on-line system was introduced as a voluntary basis

Sehingga 31 Disember 2011, 1134 syarikat berasaskan kimia telah dikenalpasti berpotensi sebagai pengilang dan pengimport EHS. Sejumlah 316 syarikat berasaskan kimia telah mendaftar dan 1,325 EHS telah didaftarkan ke dalam skim. Jumlah EHS yang telah dinotifikasi secara rasmi ialah 722 dan daripada jumlah tersebut, 176 EHS memerlukan notifikasi secara terperinci. Sebanyak 145 EHS telah dinotifikasi secara terperinci kepada JAS.

Until 31 December 2011, 1134 chemical companies had been identified as potential manufacturers and importers for Environmentally Hazardous Substances (EHS). A total of 316 chemical companies had registered and 1,325 EHS had been registered under the scheme. The number of EHS that had been officially notified were 722 and out of this,176 EHS were required to do detailed notification. The number of EHS which had already notified in detail to DOE was 145.

Disebabkan oleh isu-isu yang berkaitan dengan *"Confidential Business Information"*, sistem ini telah membenarkan syarikat-syarikat yang berdaftar di Luar Negara untuk membuat notifikasi terperinci secara terus kepada JAS dan empat (4) syarikat telah mendaftar sebagai pembekal Luar Negara sehingga 31 Disember 2011.

Due to the Confidential Business Information issues, the system now allows overseas companies to notify the detailed notification directly to DOE. Four (4) companies had registered as the overseas suppliers until 31 December 2011.

Skim ini akan menghasilkan satu inventori bagi Bahan-Bahan Berbahaya Alam Sekeliling (EHS) yang diimport dan dihasilkan di Malaysia yang dikenali sebagai Senarai Pendaftaran EHS (*EHS Register List*). Senarai ini akan digunakan sebagai garispanduan dan rujukan untuk Malaysia menghasilkan satu perundangan bagi mengawal Bahan-Bahan Berbahaya Kepada Alam Sekeliling pada masa hadapan.

This scheme will establish one inventory of imported and manufactured EHS in Malaysia known as EHS Register List. This list will be used as a guidance and reference for the DOE to come out with regulations that control EHS in the future.

Jabatan ini telah menganjurkan lima (5) siri *"Hands on Training"* pada tahun 2011 di Bilik ICT, JAS. Jumlah peserta yang telah hadir ialah seramai 78 orang yang mewakili pelbagai syarikat. Seterusnya, JAS juga telah menganjurkan enam (6) siri Seminar Kesedaran di beberapa lokasi dan jumlah peserta yang telah hadir ialah 237 orang.

The department had organized five (5) series of EHSNR hands on training which was held at the DOE's ICT room in 2011. A total of 78 participants from various companies had attended the training. Additionally, six (6) series of awareness seminars on EHSNR were also organized and the number of participants attended was 237.

PENGUATKUASAAN TERHADAP AKTIVITI PEMBAKARAN TERBUKA
ENFORCEMENT AGAINST OPEN BURNING ACTIVITIES

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 serta melalui maklumat hotspots yang dikesan melalui satelit yang dipantau dan dilaporkan oleh *ASEAN Specialised Meteorological Centre* (ASMC). Pada tahun 2011 sebanyak 2,313 kes *hotspots* telah dilaporkan melalui satelit. (**Jadual 4.19**).

Sebanyak 3,177 kes pembakaran terbuka telah dikesan pada tahun 2011 (**Jadual 4.20** & **Jadual 4.21**). Kebanyakan kes-kes pembakaran terbuka yang utama berlaku di kawasan pertanian (545), belukar (514), hutan (507) dan ladang (456) terutamanya semasa cuaca panas dan kering iaitu pada bulan Jun (327), Julai (502), Ogos (426) dan September (311). Penurunan kes pembakaran terbuka dan *hotspots* di kawasan hutan dapat dilihat di negeri yang melaksanakan projek pencegahan kebakaran dan pengurusan tanah gambut mudah terbakar iaitu di negeri Selangor, Pahang, Johor, Kelantan, Sabah dan Sarawak. Projek ini mula dilaksanakan oleh Jabatan Alam Sekitar pada tahun 2009. Daripada 3,177 kes pembakaran terbuka tersebut, 345 kes telah dikompaun dengan jumlah kompaun yang dikutip sebanyak RM481,650.00 dan dua (2) kes telah dikenakan tindakan mahkamah.

Pengawasan Melalui Udara

Pada tahun 2011, Program Pengawasan Melalui Udara telah dilaksanakan sehingga bulan Jun 2011 bagi negeri di Semenanjung Malaysia dan Sabah manakala pelaksanaaan di negeri Sarawak sehingga bulan September sahaja kerana tempoh kontrak perkhidmatan ini telah tamat. Program ini dilaksanakan untuk mengawasi dan mengesan dari udara kejadian pencemaran alam sekitar seperti aktiviti pembakaran terbuka, pelepasan dari industri, pencemaran pantai dan laut, dan aktiviti pembukaan

Open burning cases were detected during daily ground surveillance conducted by DOE State Offices at fire-prone areas, through public complaints and also through hotspots detected via satellites monitored by ASEAN Specialised Meteorological Centre (ASMC). Throughout the year 2011, a total of 2,313 hotspots were detected via satellites (**Table 4.19**).

A total of 3,177 open burning cases were detected in 2011 by the DOE State Offices. (**Table 20** & **Table 21**). Frequent incidents of open burning mainly were found to occur in algriculture areas (545), bushes (514), forests (507) and plantations areas (456) especially during the hot and dry period in the months of June (327), July (502), August (426) and September (311). A decreasing trend in the total number of open burning cases and hotspots detected in forest areas were observed in the states, namely Selangor, Pahang, Johore, Kelantan, Sabah and Sarawak that had implemented a project on fire prevention and peatland management. The project was initiated by the DOE since 2009. Out of 3,177 open burning cases detected, 345 cases were issued compounds amounting to RM481,650.00 and two (2) cases were prosecuted in court.

Airborne Surveillance

The National Aerial Surveillance Programme has been implemented till June 2011 in Peninsular Malaysia and Sabah while in Sarawak until September 2011 due to the expiry of the contract. Environmental pollution due to open burning activities, emission from industries, coastal and marine pollution, land clearing activities on highland and island development were monitored continuously. Information on the environmental

tanah serta pembangunan di kawasan tanah tinggi dan pembangunan di pulau-pulau. Maklumat mengenai kejadian pencemaran alam sekitar yang dikesan melalui pengawasan dari udara ini disalurkan terus ke bilik operasi JAS untuk diambil tindakan segera oleh pegawai penguatkuasa di lapangan.

Sejumlah RM249,764.00 diperuntukkan di bawah Projek Pembangunan pada tahun 2011 untuk pelaksanaan program ini. Sepanjang program ini, sebanyak 32 bilangan penerbangan yang melibatkan 93.4 jumlah jam penerbangan telah dilaksanakan.

pollution activities detected from the aerial surveillance would be transmitted directly to the DOE operation room for immediate follow up actions by the ground surveillance staff.

A development budget of RM249,764.00 was allocated in 2011 for aerial surveillance. In this programme, 32 flights with a total of 93.4 flight hours were undertaken.

Jadual 4.19 JAS: Bilangan Kes *Hotspots* Mengikut Negeri, 2011
Table 4.19 DOE: Number of Hotspots by States, 2011

Negeri/ State	Jan / Jan	Feb / Feb	Mac / March	Apr / Apr	Mei / May	Jun / June	Jul / July	Ogos / Aug	Sept / Sept	Okt / Oct	Nov / Nov	Dis / Dec	Jumlah / Total
Johor	7	12	2	10	1	3	6	12	7	3	0	3	66
Kedah	5	21	20	14	0	3	2	7	8	9	0	2	91
Kelantan	3	15	8	26	7	3	4	13	7	4	0	1	91
Melaka	0	1	5	4	1	0	0	0	4	0	1	0	16
Negeri Sembilan	1	1	2	3	1	4	2	3	8	3	1	2	31
Pahang	9	20	5	38	18	26	30	52	40	14	1	2	255
Perak	7	26	12	16	6	9	11	9	18	9	2	0	125
Perlis	0	4	2	1	0	0	0	1	0	1	0	1	10
Pulau Pinang	1	5	1	1	0	1	1	1	2	0	1	1	15
Sabah	1	3	8	15	6	20	35	19	42	27	3	2	181
Sarawak	25	23	52	57	116	170	243	281	207	58	40	11	1,283
Selangor	2	15	9	13	3	6	7	11	14	6	0	3	89
Terengganu	0	8	2	10	5	3	4	12	9	6	0	0	59
W.P. Kuala Lumpur/ Putrajaya	0	0	0	0	0	0	0	0	1	0	0	0	1
W.P. Labuan	0	0	0	0	0	0	0	0	0	0	0	0	0
Jumlah / Total	**61**	**154**	**128**	**208**	**164**	**248**	**345**	**421**	**367**	**140**	**49**	**28**	**2,313**
Jumlah Keseluruhan / Total Amount : 2,313													

Jadual 4.20 JAS: Bilangan Kes Pembakaran Terbuka Mengikut Negeri, 2011
Table 4.20 DOE: Number of Open Burning Cases by State, 2011

Negeri / State	Ladang / Plantation	Pertanian / Agriculture	Belukar / Bushes	Hutan / Forest	Tapak Pembinaan / Construction Sites	Tapak Pelupusan / Disposal Sites	Industri / Industry	Lain-Lain / Others
Perlis	2	24	0	0	2	0	1	4
Kedah	10	25	13	26	8	15	4	45
Pulau Pinang	4	5	14	15	28	0	4	91
Perak	8	16	13	101	11	13	9	37
Selangor	16	35	39	23	29	43	22	221
W.P Kuala Lumpur	0	1	0	2	3	8	0	10
Negeri Sembilan	7	5	11	9	3	12	3	40
Melaka	9	2	13	1	12	1	4	45
Johor	22	28	12	11	25	8	28	46
Pahang	88	28	33	121	24	2	13	56
Terengganu	21	12	15	23	3	1	7	15
Kelantan	12	28	9	42	11	11	24	49
Sarawak	256	333	328	132	4	5	9	26
Sabah	1	1	2	1	10	9	4	22
W.P Labuan	0	2	12	0	1	2	1	11
Jumlah / Total	**456**	**545**	**514**	**507**	**174**	**130**	**133**	**718**
Jumlah Keseluruhan / Total Amount: 3,177								

Jadual 4.21 JAS: Bilangan Kes Pembakaran Terbuka Bulanan, 2011
Table 4.21 DOE: Number of Open Burning Cases by Month, 2011

Bulan / Month	Ladang / Plantation	Pertanian / Algriculture	Belukar / Bushes	Hutan / Forest	Tapak Pembinaan / Construction Sites	Tapak Pelupusan / Disposal Sites	Industri / Industry	Lain-Lain / Others
Januari/ January	14	21	26	20	19	17	17	97
Februari/ February	22	73	30	52	19	25	15	102
Mac/ March	23	31	47	36	21	16	14	88
April/ April	51	28	37	62	26	13	13	63
Mei/ May	53	28	44	45	22	8	18	78
Jun/ June	75	33	40	58	13	9	12	87
Julai/ July	81	70	94	75	19	12	15	136
Ogos/ August	52	151	85	68	6	4	7	53
September/ September	50	90	65	66	11	7	8	14
Oktober/ October	15	10	28	18	7	8	6	0
November/ November	13	6	14	4	5	4	1	0
Disember/ December	7	4	4	3	6	7	7	0
Jumlah / Total	**456**	**545**	**514**	**507**	**174**	**130**	**133**	**718**
Jumlah Keseluruhan / Total Amount: 3,177								

PUNCA-PUNCA BERGERAK (KENDERAAN BERMOTOR)
MOBILE SOURCES (MOTOR VEHICLES)

Sehingga akhir tahun 2011, sebanyak 21,401,269 buah kenderaan bermotor telah berdaftar di Malaysia, iaitu pertambahan sebanyak 1,212,704 buah kenderaan (6%) berbanding tahun 2010. Pecahan keseluruhan kenderaan bermotor yang berdaftar mengikut jenis kenderaan adalah seperti di **Rajah 4.14**.

By the end of 2011, there were about 21,401,269 registered motor vehicles in Malaysia, an increase of 1,212,704 units (6%) compared to 2010. The breakdown of the total registered vehicles according to vehicle types is given in **Figure 4.14**.

Dari sejumlah 1,211,999 buah kenderaan baru yang didaftarkan dalam tahun 2011, kategori motokar merupakan yang tertinggi iaitu sebanyak 594,610 unit (49.06%) diikuti motosikal sebanyak 542,308 unit (44.74%), manakala sebanyak 75,081 unit (6.2%) adalah dari lain-lain jenis kenderaan termasuk lori, bas, van dan sebagainya.

Out of 1,211,999 new vehicles registered in 2011, motorcars made up the highest number with 594,610 units (49.06%) followed by motorcyles 542,308 units (44.74%) while the remaining 75,081 (6.2%) were from the other vehicle types such as lorries, buses, vans and others.

Taburan bilangan kenderaan bermotor di Malaysia mengikut negeri adalah seperti di **Rajah 4.15**. Wilayah Persekutuan Kuala Lumpur mendahului negeri-negeri lain dengan mempunyai bilangan kenderaan yang tertinggi iaitu sebanyak 4,963,646 unit (atau 23.19%) daripada keseluruhan bilangan kenderaan yang berdaftar di negara ini, diikuti oleh Negeri Johor, Selangor, Pulau Pinang dan Perak.

The distribution of registered vehicles throughout the states is given in **Figure 4.15**. The Federal Territory of Kuala Lumpur recorded the highest number of vehicles registered, with 4,963,646 (23.19%) followed by Johor, Selangor, Pulau Pinang and 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.

Control of Smoke and Gaseous Emissions From Motor Vehicles

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

Kawalan Pelepasan Asap Hitam Dari Kenderaan Diesel

Kawalan pelepasan asap hitam berlebihan dari ekzos kenderaan diesel dilaksanakan melalui Program AWASI (Area Watch And Sanction Inspection). Melalui Program AWASI ini, skuad peronda JAS akan

Control of Black Smoke Emission From Diesel Vehicles

The control of excessive black smoke emission emitted from diesel vehicle exhausts is by the AWASI (Area Watch And Sanction Inspection) Programme. Through this programme the DOE's mobile squad would go

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.

round patrolling the streets, observing 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). Kompaun serta perintah larangan menggunakan kenderaan di jalan raya akan dikeluarkan sekiranya kenderaan didapati melepaskan asap hitam melebihi 70 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 and a prohibition order (prohibiting vehicle use) will be issued if the smoke limit exceeds 70 HSU.

Pada tahun 2011, sebanyak 2,075 operasi penguatkuasaan telah dilaksanakan di bandar-bandar di seluruh negara. Sebanyak 242,892 buah kenderaan diesel telah diperiksa, dan dari jumlah tersebut, sebanyak 2,917 buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan asap hitam sebanyak 50 HSU, manakala 342 daripadanya telah dikenakan perintah larangan beroperasi sehingga dibaikpulih dan lulus ujian asap semula oleh JAS. Pada keseluruhannya, peratus pematuhan oleh kenderaan diesel adalah 98.8% Ini adalah peningkatan sebanyak 0.01% berbanding dengan tahun 2010.

In 2011, a total of 2,075 enforcement programmes were conducted in the cities throughout the country. A total of 242,892 diesel vehicles were visually inspected, out of which 2,917 vehicles were compounded for failing to comply with the 50 HSU smoke limit including 342 vehicles issued with the prohibition order. Vehicles issued with prohibition orders were required to undergo smoke retest by the DOE before being allowed on the road again. Overall compliance of diesel vehicles was 98.8%.This is an increase of 0.01% compared to 2010.

Bilangan kenderaan diesel yang dikompaun dan peratus pematuhan mengikut jenis kenderaan adalah seperti di **Rajah 4.16**. **Rajah 4.17** pula menunjukkan bilangan kenderaan dikompaun, pengeluaran perintah larangan serta peratus pematuhan mengikut negeri. Tindakan mahkamah telah juga diambil ke atas 314 pemandu serta pemilik kenderaan kerana gagal menjelaskan kompaun yang telah dikenakan.

The number of vehicles summoned and their percentage of compliance according to vehicle types is given in **Figure 4.16**. **Figure 4.17** 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 314 drivers and vehicle owners for failing to settle the compounds issued.

Kawalan Pelepasan Gas CO dan HC Dari Kenderaan Petrol

Sepanjang tahun 2011, sejumlah 4,771 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 tersebut, sebanyak 533 buah kenderaan telah dikompaun kerana gagal mematuhi had pelepasan yang dibenarkan. Peratus pematuhan secara keseluruhannya adalah 88.83%. Ini adalah penurunan sebanyak 4.27% berbanding dengan tahun 2010.

Control of CO and HC Gas Emissions from Petrol Vehicles

Throughout 2011, a total of 4,771 petrol powered vehicles were inspected using the CO-HC gas analyzer via the idling test method conducted at the road side. From the above total, 533 vehicles were compounded for failing to comply with the stipulated CO and HC limits. The overall percentage of compliance is 88.83%. This is a decrease of 4.27% compared to 2010. Warning letters were issued to drivers for immediate

Surat amaran juga telah dikeluarkan kepada pemandu-pemandu kenderaan yang gagal mematuhi had-had pelepasan CO dan HC supaya segera membaiki kenderaan bagi memastikan kenderaan sentiasa mematuhi had pelepasan yang ditetapkan oleh undang -undang.

repairs 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 bermotor dengan tujuan memperbaiki pelepasan pencemar menggunakan rekabentuk enjin baru dan teknologi kawalan pelepasan.

Pada atau selepas 1 Januari 2000, mana-mana model baru kenderaan bermotor dikehendaki mematuhi standard pelepasan pencemar yang ditetapkan dalam Jadual Ketiga, Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Enjin Petrol),1996 di mana jisim karbon monoksida yang dibenarkan hendaklah tidak melebihi 2.2 g/km, manakala kombinasi hidrokarbon dan nitrogen oksida hendaklah tidak melebihi 0.5 g/km. Pada tahun 2011, Jabatan Alam Sekitar telah mengeluarkan sebanyak 33 Sijil Ujian Kelulusan Jenis bagi model baru kenderaan yang akan dipasarkan di Malaysia.

Type Approval Test (Petrol Vehicles)

Malaysia had established exhaust emission standard for new 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 and after 1 January 2000 is required to comply with emission standards prescribed in the Third Schedule of the Environmental Quality (Control of Emission from Petrol Engines) Regulations, 1996. The mass of carbon monoxide shall not exceed 2.2 g/km while the combination of hydrocarbon and nitrogen oxides shall not exceed 0.5 g/km. In 2011, the Department of Environment has issued 33 Type Approval Test Certificates for new models to be marketed in Malaysia.

Pengwujudan Kemudahan Yang Diluluskan

Bagi membolehkan orang ramai menghantar kenderaan mereka untuk menjalani ujian pelepasan asap dan gas, JAS melalui program “Kemudahan Yang Diluluskan (KYDL)” telah memberi pengiktirafan kepada bengkel-bengkel kenderaan yang memenuhi kriteria-kriteria yang telah ditetapkan. Melalui program KYDL ini, tindakan segera untuk menguji serta membaiki kenderaan boleh dilakukan di pusat-pusat yang diluluskan oleh JAS bagi memastikan kenderaan sentiasa mematuhi undang-undang pelepasan asap ketika beroperasi di jalanraya.

Sehingga akhir tahun 2011, sebanyak 59 bengkel serta pusat-pusat pemeriksaan kenderaan di seluruh negara telah diberikan sijil pengiktirafan 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 had 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 2011, a total of 59 workshops and vehicle testing centres throughout the country were registered as “Approved Testing Facilities” by DOE.

Kawalan Pelepasan Asap Daripada Motosikal

Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Daripada Motosikal), 2003 telah diwartakan dan mula dikuatkuasa mulai 1 Januari 2004. Peraturan ini telah menggariskan piawai pelepasan seperti berikut:-

- Standard Kelulusan Jenis bagi motosikal baru : 97/24/EC
- Standard pelepasan (*idling*) bagi motosikal terpakai : 4.5 % CO (Karbon Monoksida)

Pengimport motosikal adalah dikehendaki mematuhi standard baru pelepasan berkuatkuasa 1 Januari 2005 bagi model baru dan 1 Julai 2005 bagi model sedia ada, manakala pembuat tempatan hendaklah mematuhi standard pelepasan baru berkuatkuasa 1 Julai 2005 bagi model baru dan 1 Julai 2006 bagi model sedia ada. Sepanjang tahun 2011, sebanyak enam (6) Sijil Kelulusan Jenis telah dikeluarkan kepada pembuat, pemasang dan pengimport motorsikal untuk pasaran dalam negara.

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 tahun 2011, sejumlah 3,291 buah motosikal telah ditahan untuk menjalani ujian pelepasan bunyi bising. Dari jumlah ini, 81 penunggang motosikal telah dikompaun oleh pihak polis kerana melanggar had bunyi bising yang dibenarkan. Peratus pematuhan secara keseluruhannya ialah 97.5 % (**Rajah 4.18**). Ini adalah peningkatan sebanyak 1.3% berbanding dengan tahun 2010.

Control of Emission from Motorcycles

Regulation to control air pollution from motorcycle exhausts namely, the Environmental Quality (Control of Emission from Motorcycles) Regulations, 2003 has been gazetted and these regulations entered into force on 1 January 2004. The emission standards adopted are as follows:-

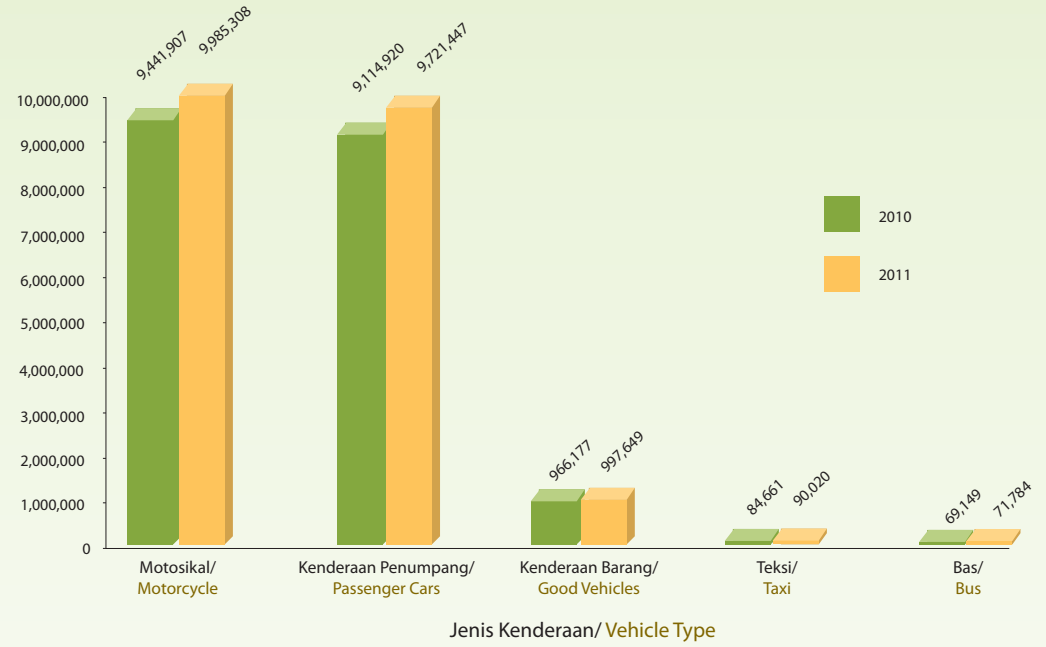
- Type Approval Emission Standard for new motorcycles : 97/24/EC
- Idling Emission Standard for in-use motorcycles : 4.5 % CO (Carbon Monoxide)

Motorcycle importers are required to comply with the new emission standards effective from 1 January 2005 for new models and 1 July 2005 for current models, while the local manufacturers had to comply with the new emission standards effective from 1 July 2005 for new models and 1 July 2006 for current models. Throughout 2011, a total of six (6) Type Approval Test Certificates were issued to the manufacturers, assemblers and importers of motorcycles for the domestic market.

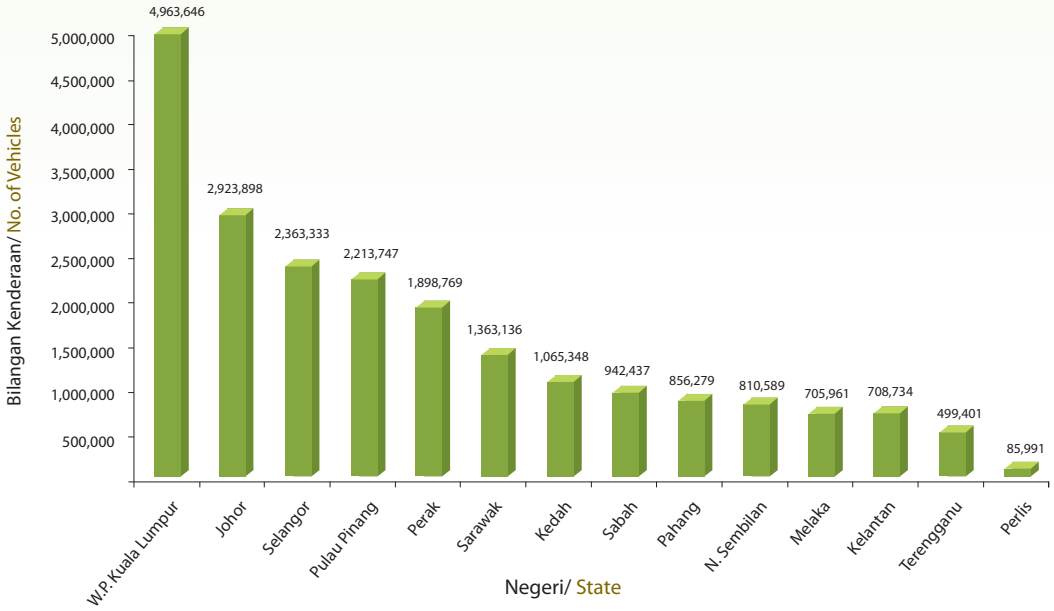
Noise from Motor Vehicles

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

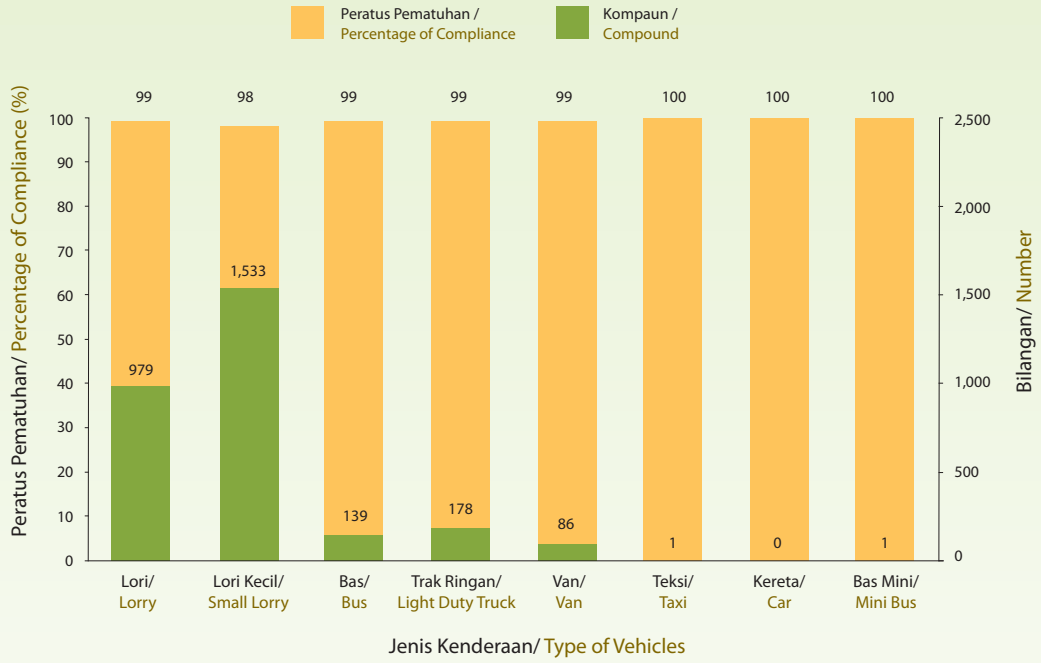
Enforcement campaigns to control excessive noise from motorcycles were jointly conducted by the DOE and the Traffic Police. In 2011, a total of 3,291 motorcycles were stopped for the noise inspection. From the above total, 81 motorcyclists were summoned by the Traffic Police for violating the stipulated noise limits. The overall percentage of compliance is 97.5 % (**Figure 4.18**). This is an increase of 1.3% compared to 2010.



Rajah 4.14 JAS : Bilangan Kenderaan Bermotor Mengikut Jenis, 2010-2011
Figure 4.14 DOE : Number of Motor Vehicles by Type, 2010-2011

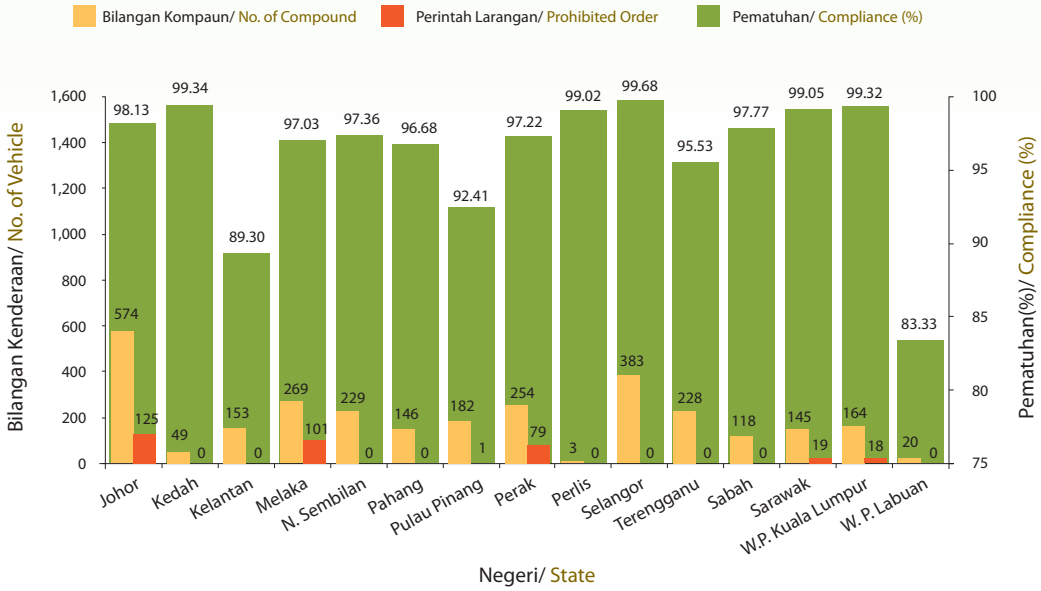


Rajah 4.15 JAS : Bilangan Kenderaan Bermotor Mengikut Negeri, 2011
Figure 4.15 DOE : Number of Motor Vehicles by State, 2011



Rajah 4.16 JAS: Penguatkuasaan Pelepasan Asap Hitam Kenderaan Diesel, Bilangan Saman dan Peratus Pematuhan Mengikut Jenis Kenderaan, 2011

Figure 4.16 DOE: Enforcement of Vehicular Black Smoke Emission, Compound and Percentage of Compliance According Type, 2011



Rajah 4.17 JAS: Penguatkuasaan Pelepasan Asap Hitam Kenderaan Mengikut Negeri, 2011

Figure 4.17 DOE: Enforcement of Vehicular Black Smoke by State, 2011

Rajah 4.18 JAS: Penguatkuasaan Pelepasan Bunyi Bising Motosikal, 1999 - 2011
Figure 4.18: Enforcement of Motorcycle Noise Emission, 1999 - 2011

TINDAKAN UNDANG-UNDANG
LEGAL ACTION

Pendakwaan

Pada tahun 2011, sejumlah 811 kes kesalahan di bawah Akta Kualiti Alam Sekeliling (AKAS) 1974 telah didakwa di mahkamah yang melibatkan denda berjumlah RM4,093,700. (**Rajah 4.19**).

Daripada jumlah keseluruhan kes tersebut, sebanyak 518 (63.9%) kes mahkamah adalah melibatkan kesalahan pencemaran udara daripada kenderaan bermotor iaitu pelepasan bendasing ke udara melebihi had yang ditetapkan di bawah Seksyen 22(1), AKAS 1974 dengan jumlah denda sebanyak RM604,900. Sebanyak 95 (11.7%) kes mahkamah yang melibatkan pelepasan efluen melebihi had yang ditetapkan di bawah Seksyen 25(1), AKAS 1974 dengan jumlah denda sebanyak RM1,578,000.

Selain itu, sebanyak 105 (12.9%) kes adalah melibatkan kesalahan pelanggaran syarat lesen di bawah Seksyen 16, AKAS 1974 dengan jumlah denda sebanyak RM1,190,800, sementara 93 (11.5%) kes yang selebihnya melibatkan kesalahan-kesalahan lain di bawah AKAS 1974.

Kompaun

Sejumlah 6,078 kompaun telah dikeluarkan sepanjang tahun 2011 kepada premis dan syarikat untuk pelbagai kesalahan di bawah AKAS 1974. Daripada jumlah keseluruhan tersebut, sebanyak 2,941 (48.4%) kompaun dikeluarkan bagi kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan Dari Enjin Diesel) 1996, sebanyak 1,060 (17.4%) kompaun bagi kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005, sebanyak 739 (12.2%) kompaun bagi kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Udara Bersih) 1978, sebanyak 604 (9.9%) kompaun bagi kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Kawalan Pelepasan dari Enjin Petrol) 1996, sebanyak 355 (5.8%) kompaun bagi kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Efluen Perindustrian) 2009, 329 (5.4%) kompaun bagi kesalahan di bawah Seksyen 29A,

Prosecution

In 2011, a total of 811 offences were prosecuted under the Environmental Quality Act (EQA) 1974 and fined a total of RM4,093,700. (**Figure 4.19**).

Out of this total, 518 (63.9%) court cases involved offences related to air pollution from motor vehicle emissions exceeding the stipulated standards under Section 22(1) of the EQA 1974 and fined a total of RM604,900. There were 95 (11.7%) cases involved in effluent discharges exceeding the stipulated standards under Section 25(1) of the EQA 1974, and fined RM1,578,000.

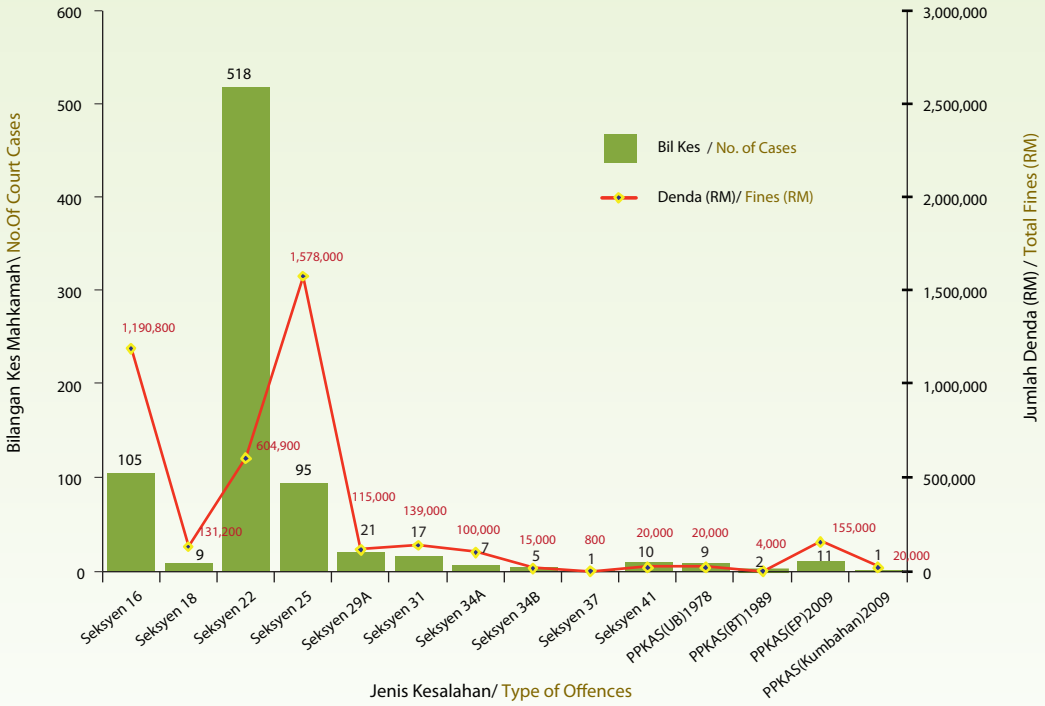
Apart from that, 105 (12.9%) cases were involved in violating conditions of licences under Section 16 of the Act and fined RM1,190,800, while the remaining 93 (11.5%) cases were prosecuted for various other offences under the EQA 1974.

Compounds

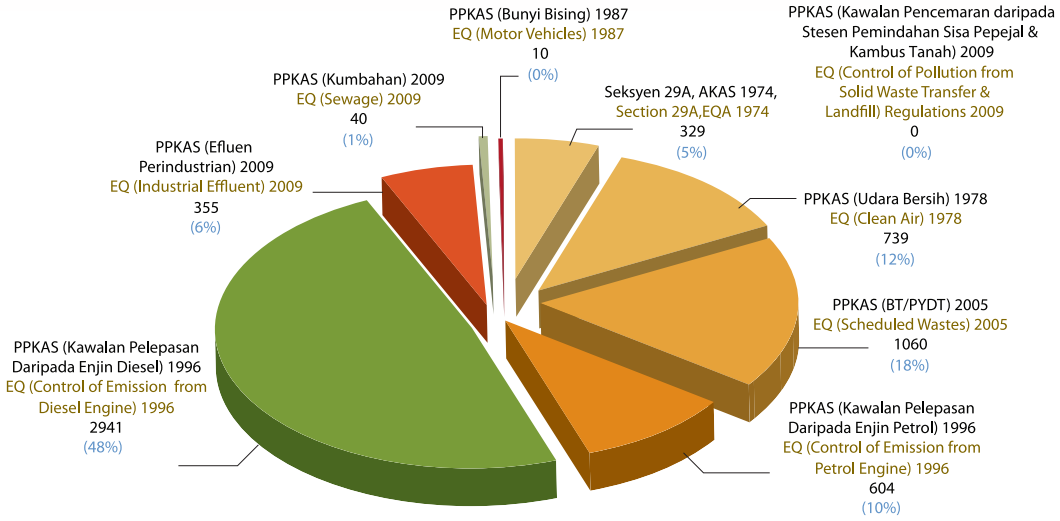
A total of 6,078 compounds were issued in 2011 against premises and companies for various offences under the EQA 1974. Out of this total, 2,941 (48.4%) were offences under the Environmental Quality (Control of Emission from Diesel Engine) Regulations 1996, 1,060 (17.4%) were offences under the Environmental Quality (Scheduled Wastes) Regulations 2005, 739 (12.2%) were offences under the Environmental Quality (Clean Air) Regulations 1978, 604 (9.9%) were offences under the Environmental Quality (Control of Emission from Petrol Engine) Regulations 1996, 355 (5.8%) were offences under the Environmental Quality (Industrial Effluents) Regulations 2009, 329 (5.4%) were offences under Section 29A of the EQA 1974, 40 (0.7%) were offences under the Environmental Quality (Sewage) Regulations 2009 and 10 (0.2%)

AKAS 1974, 40 (0.7%) kompaun bagi kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Kumbahan) 2009 dan 10 (0.2%) kompaun bagi kesalahan di bawah Peraturan-Peraturan Kualiti Alam Sekeliling (Bunyi Bising Kenderaan Motor) 1987 (**Rajah 4.20**).

were offences under the Environmental Quality (Motor Vehicle Noise) Regulations 1987 (**Figure 4.20**).



Rajah 4.19 JAS: Jabatan Alam Sekitar : Bilangan Kes Mahkamah dan Denda, 2011
Figure 4.19 DOE: Number of Court Cases and Fines, 2011



Rajah 4.20 JAS: Bilangan Kes Kompaun Mengikut Pecahan Peraturan-Peraturan Kualiti Alam Sekeliling, 2011
Figure 4.20 DOE: Number of Compound Cases According to Environmental Quality Regulations, 2011

MAKLUMBALAS TERHADAP PENGADUAN AWAM
RESPONSE TO PUBLIC COMPLAINTS

Jabatan Alam Sekitar (JAS) telah menerima sejumlah 6,047 aduan pencemaran alam sekitar pada tahun 2011. Daripada jumlah ini, 4,772 kes aduan telah diambil tindakan di bawah peruntukan Akta Kualiti Alam Sekeliling (AKAS), 1974 dan Peraturan-peraturan di bawahnya oleh Pejabat JAS Negeri, manakala 1,275 kes aduan yang di luar bidangkuasa JAS telah dirujuk kepada agensi lain yang berkaitan untuk diambil tindakan. (**Rajah 4.21**)

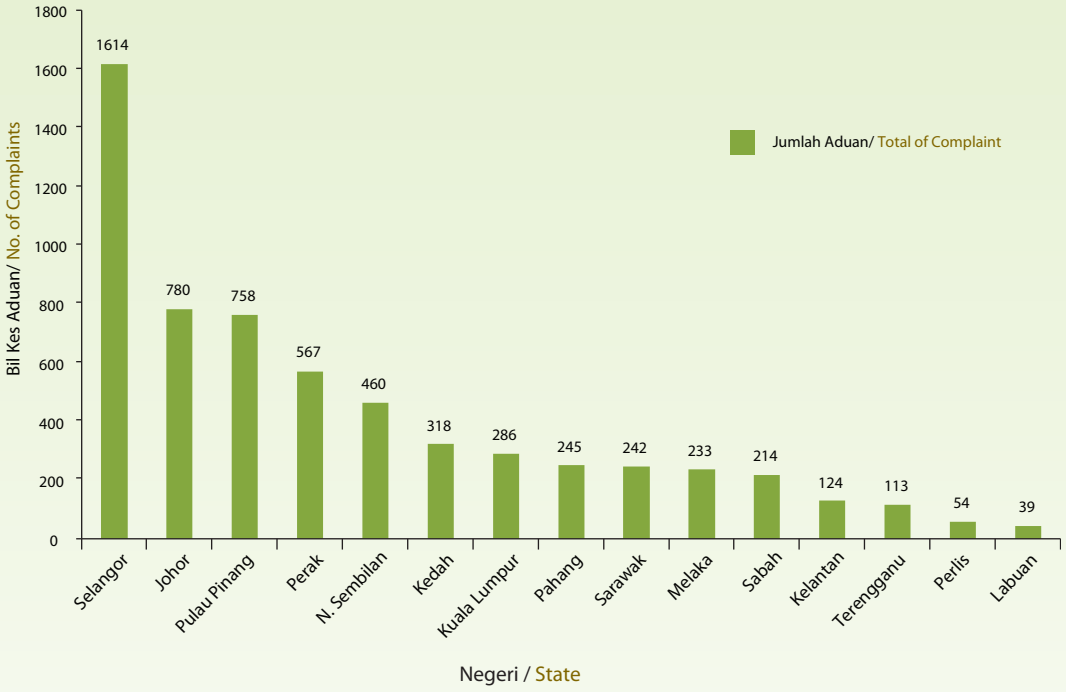
Pada tahun 2011, Selangor menerima bilangan aduan yang paling tinggi iaitu sebanyak 1,614 kes (26.7%), diikuti oleh Johor sebanyak 780 kes (12.9%) dan Pulau Pinang sebanyak 758 kes (12.5%). Wilayah Persekutuan Labuan menerima aduan yang paling sedikit iaitu sebanyak 39 kes (0.6%) diikuti dengan Perlis iaitu sebanyak 54 kes (0.9%).

Seperti tahun-tahun yang sebelumnya, bilangan aduan pencemaran yang tertinggi adalah berkaitan dengan pencemaran udara iaitu sejumlah 4,311 kes (71.3%), sejumlah 751 kes (12.4%) berkaitan pencemaran air, 239 kes (4.0%) berkaitan pencemaran bunyi bising, 197 kes (3.3%) berkaitan pelupusan buangan terjadual secara haram, 92 kes (1.5%) berkaitan tumpahan minyak, 55 kes (0.9%) berkaitan pencemaran tanah dan sejumlah 402 kes (6.6%) mengenai lain-lain aduan (**Rajah 4.22**).

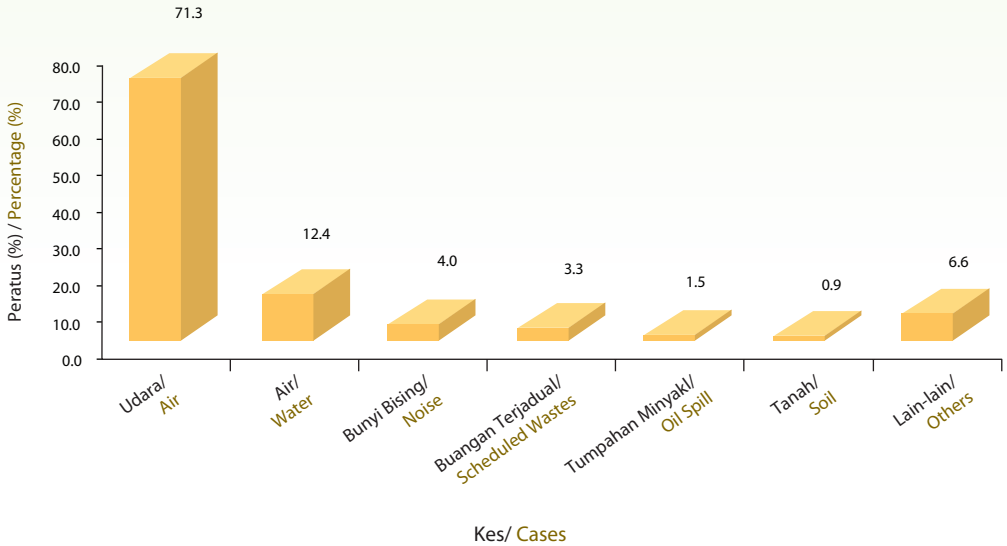
The Department of Environment received a total of 6,047 environmental pollution complaints in 2011. Out of these, 4,772 cases were under the Environmental Quality Act, 1974 and investigated by the State DOE Offices, while the remaining 1,275 cases were outside the jurisdiction of DOE and were referred to other relevant agencies for their further action. (**Figure 4.21**)

In 2011, Selangor recorded 1,614 (26.7%) complaints, the highest number received, followed by Johor 780 (12.9%) and Penang 758 (12.5%). Federal Territory of Labuan recorded the least number of complaints received with only 39 (0.6%) complaints followed by Perlis 54 (0.9%).

As in the previous years, most of the complaints received were related to air pollution, 4,311 (71.3%), followed by 751 (12.4%) on water pollution, 239 (4.0%) on noise pollution, 197 (3.3%) on illegal dumping of scheduled or toxic wastes, 92 (1.5%) on oil spills, 55 (0.9%) on soil pollution and 402 (6.6%) on other complaints (**Figure 4.22**).



Rajah 4.21 JAS: Bilangan Aduan Mengikut Negeri, 2011
Figure 4.21 DOE: Number of Complaint by State, 2011



Rajah 4.22 JAS: Bilangan Kes Aduan Mengikut Jenis, 2011
Figure 4.22 DOE: Number of Complaint Cases by Type, 2011

BAB 5 / CHAPTER 5

PROMOSI KESEDARAN DAN PENDIDIKAN ALAM SEKITAR
PROMOTION OF ENVIRONMENTAL EDUCATION AND AWARENESS

Program Rakan Alam Sekitar (RAS)

Program Rakan Alam Sekitar (RAS) adalah satu inisiatif berterusan membangunkan kesedaran dan menggerakkan anggota masyarakat secara *hands-on* dalam aktiviti pemuliharaan alam sekitar selain menjadi mata dan telinga untuk membantu agensi-agensi kerajaan yang bertanggungjawab dalam membanteras kegiatan-kegiatan yang merosakkan atau mencemarkan alam sekitar.

Media sosial seperti Portal RAS, email RAS dan Facebook RAS telah diwujudkan sebagai medium perkongsian informasi di antara ahli RAS dan orang awam serta salah satu usaha berterusan mempromosikan Program RAS. Informasi aktiviti RAS akan dikongsi bersama masyarakat bagi memastikan tahap kesedaran dan komitmen masyarakat dalam usaha pemuliharaan dan pemeliharaan sentiasa meningkat.

Pelaksanaan aktiviti-aktiviti di bawah program RAS pada tahun 2011 seperti pembersihan pantai, penanaman pokok, pemantauan kualiti air dan Kem Kesedaran Alam Sekitar adalah dengan kerjasama pelbagai pihak seperti pejabat ahli parlimen, agensi kerajaan, swasta, industri, pertubuhan bukan kerajaan (NGO) dan pemimpin masyarakat setempat.

Sejak program ini dilancarkan sehingga kini, sebanyak 63,000 telah mendaftar sebagai ahli RAS. Majoriti ahli RAS adalah daripada golongan belia di antara umur 13 hingga 40 tahun. Pendaftaran adalah terbuka kepada semua warganegara Malaysia. Pendaftaran secara online boleh dilakukan di **www.doe.gov.my/ras.**

Minggu Alam Sekitar Malaysia (MASM)

Minggu Alam Sekitar Malaysia (MASM) merupakan acara tahunan anjuran Jabatan Alam Sekitar yang disambut bertujuan untuk menyemai dan meningkatkan kesedaran alam sekitar di kalangan seluruh masyarakat Malaysia. Sambutan MASM ke-20 telah diadakan pada

Rakan Alam Sekitar (RAS) Programme

The "Rakan Alam Sekitar" programme is an ongoing initiative to develop environmental awareness and mobilizing community members in hands-on environmental activities as well as being the 'eyes' and 'ears' of related government agencies for combating environmental pollution.

Using social media namely RAS Portal, RAS email and RAS facebook as a medium of information sharing among RAS members and the public, information on RAS activities will be shared to ensure the level of community awareness and commitment in preservation and conservation of the environment are continuously increasing.

Various RAS activities in 2011 such as beach cleaning, tree planting, water quality monitoring and environmental awareness camps in collaboration with various parties including Members of Parliament, government agencies, private sector, industries,non-governmental organizations (NGO) and local community leaders were implemented.

To date, the RAS Programme has 63,000 registered members of which the majorities of the members are youths between the age of 13 to 40. Online registration as RAS members is open to all Malaysians and can be made at **www.doe.gov.my/ras**.

Malaysia Environment Week (MASM)

The annual Malaysia Environment Week (MASM) is a premier event organized by the Department of Environment, primarily to inculcate and enhance environmental awareness among Malaysians. The 20th MASM celebration was held on 18 October 2011

18 Oktober 2011 bertempat di Pusat Konvensyen Taman Tamadun Islam, Kuala Terengganu, Terengganu dengan tema sambutan "Pemuliharaan Alam Sekitar, Tanggungjawab Bersama". Sambutan pada kali ini telah dirasmikan oleh Y.B. Dato Sri Douglas Uggah Embas, Menteri Sumber Asli dan Alam Sekitar. Seramai 1,000 orang dari pelbagai sektor termasuk 360 pelajar sekolah telah menghadiri majlis ini. Beberapa aktiviti telah dijalankan sepanjang majlis seperti pameran alam sekitar dan persembahan nyanyian oleh 40 orang kanak-kanak sekolah.

at Taman Tamadun Islam Convention Centre, Kuala Terengganu, Terengganu with the theme "Environmental Conservation, Our Shared Responsibility". Y.B. Dato Sri Douglas Uggah Embas, the Minister of Natural Resources and Environment officiated the launch of MASM 2011. About 1,000 people from different sectors including 360 school children participated in this event. Several activities were organized during the event including an environmental exhibition and an action song performance by 40 school children.

Bersempena dengan pelancaran MASM ini juga, penerima anugerah bagi Anugerah Langkawi 2010/2011 dan Projek Terbaik Sekolah Lestari-Anugerah Alam Sekitar di bawah Program Rakan Alam Sekitar telah diumumkan. Pada tahun ini, penerima Anugerah Langkawi (kategori persatuan/organisasi) telah dianugerahkan kepada Frangipani Langkawi Resort & Spa, Langkawi. Anugerah ini diberikan di atas sumbangannya dalam melaksanakan aktiviti kitar semula dan penjimatan tenaga serta sumbangannya yang signifikan kepada alam sekitar dan masyarakat setempat.

In conjunction with the launch of MASM, the Langkawi Award 2010/2011 and the Best Project of the Sustainable School-Environment Award under the Rakan Alam Sekitar Programme were also presented to the winners. This year, the Langkawi Award (Organization/Association Category) was presented to the Frangipani Langkawi Resort & Spa in Langkawi. This award was given to the organization for practising recycling and energy conservation activities and contributing significantly to environmental protection and surrounding communities.

Sementara itu, bagi Projek Terbaik Sekolah Lestari-Anugerah Alam Sekitar kategori sekolah menengah telah dianugerahkan kepada SM St. Michael, Penampang, Sabah manakala Sekolah Kebangsaan Ledang, Tangkak, Johor bagi kategori sekolah rendah.

Meanwhile, the Best Project of the Sustainable School-Environment Award went to SM St. Michael, Penampang, Sabah in the secondary school category, while Sekolah Kebangsaan Ledang, Tangkak, Johor won the award for the primary school category.

Kesemua anugerah telah disampaikan oleh Y.B. Menteri Sumber Asli dan Alam Sekitar. Hadir bersama pada majlis penganugerahan tersebut adalah Y.B. Dato' Toh Chin Yaw, Pengerusi Jawatankuasa Perindustrian, Perdagangan dan Alam Sekitar Negeri Terengganu.

All the awards were presented by the Honourable Minister of Natural Resources and Environment. Y.B. Dato' Toh Chin Yaw, chairman of Industry, Trade and Environment Committee for Terengganu State was also present at the award ceremony.

Hari Alam Sekitar Sedunia (WED)

World Environment Day (WED)

Hari Alam Sekitar Sedunia yang disambut serata dunia menggalakkan tindakan positif ke arah pemeliharaan alam sekitar. Hari Alam Sekitar Sedunia disambut pada 5 Jun setiap tahun dan tema pada tahun ini adalah "Hutan: Alam Semulajadi Sedia Berkhidmat Untuk Anda".

World Environment Day which is an annual event celebrated globally, calls for positive action towards environmental conservation. World Environment Day is celebrated on 5 June every year and the theme for this year is "Forests: Nature at Your Service".

Pada tahun ini, majlis penganugerahan Sekolah Lestari - Anugerah Alam Sekitar 2009/2010 telah diadakan bersempena dengan sambutan WED

In 2011, the Sustainable School 2009/2010 Award Giving Ceremony was held in conjunction with WED on 16 June 2011 at SM St. Michael, Penampang

pada 16 Jun 2011 bertempat di SM St. Michael, Penampang, Sabah yang juga merupakan sekolah yang menerima anugerah Sekolah Lestari (Kategori Sekolah Menengah). Majlis ini telah disempurnakan oleh Y.B. Tan Sri Datuk Seri Panglima Joseph Kurup, Timbalan Menteri Sumber Asli dan Alam Sekitar. Seramai 500 orang dari pelbagai sektor, termasuk pelajar sekolah telah menghadiri majlis ini.

Sabah, which was the recipient of the Sustainable School award (secondary category). The ceremony was officiated by Y.B. Tan Sri Datuk Seri Panglima Joseph Kurup, Deputy Minister of Natural Resources and Environment. About 500 people from different sectors, including school children, participated in this event.

Beberapa aktiviti lain turut diadakan sempena WED antaranya pemberian sebanyak 20 buah basikal kepada pelajar sekolah terpilih yang merupakan ahli Rakan Alam Sekitar, lawatan ke sekitar kawasan sekolah, pameran alam sekitar dan penanaman pokok oleh beberapa tetamu yang hadir.

Several activities were organized to commemorate WED namely the presentation of 20 bicycles to selected students who are Rakan Alam Sekitar members, a tour of the ongoing environmental activities in the school, environmental exhibition and tree planting.

Sambutan Minggu Alam Sekitar Malaysia Ke 20
The 20th Malaysia Environment Week

Pertandingan Debat Alam Sekitar Antara Insitusi Pengajian Tinggi

Sejak tahun 1991, Debat Alam Sekitar Antara Institusi Pengajian Tinggi merupakan program tahunan yang dianjurkan oleh JAS dengan kerjasama Kementerian Pengajian Tinggi, Majlis Debat Universiti-Universiti Malaysia (MADUM) dan Dewan Bahasa dan Pustaka.

Pertandingan debat ini merupakan debat ala parlimen. Penentuan pasukan yang akan berlawan dan juga peranan mereka sebagai kerajaan atau pembangkang dibuat menggunakan kaedah *system bracket power match* untuk pusingan awal. Kedudukan setiap pasukan dibuat berdasarkan menang/kalah, juri, julat kemenangan dan markah keseluruhan.

Pertandingan Peringkat Awal melibatkan enam (6) pusingan. Lapan (8) pasukan terbaik akan dipilih untuk ke peringkat suku akhir dan empat (4) pasukan yang menang akan ke peringkat separuh akhir dan seterusnya dua (2) pasukan akan ke peringkat akhir.

Pertandingan Debat Alam Sekitar Antara Institusi Pengajian Tinggi Kali Ke 21 yang disertai oleh 24 Institusi Pengajian Tinggi (IPT) telah diadakan di Universiti Teknikal Malaysia Melaka (UTeM) pada 23 hingga 27 September 2011. Pertandingan Akhir Debat Alam Sekitar Antara Institusi Pengajian Tinggi ke 21 ini telah disaksikan oleh lebih kurang 500 penonton di Dewan Besar, UTeM di antara pasukan Universiti Malaya (UM) dan pasukan Universiti Sains Islam Malaysia (USIM).

Pasukan USIM muncul sebagai johan dan menerima Piala Pusingan Menteri Sumber Asli dan Alam Sekitar, wang tunai RM8,000.00 serta sijil penyertaan. Mohd Ikhwan bin Rosseli, pendebat daripada USIM telah muncul sebagai Pendebat Terbaik dan menerima Piala Ketua Pengarah Alam Sekitar beserta wang tunai RM1,500.00 dan sijil penyertaan. Hadiah-hadiah telah disampaikan oleh YBhg. Dr. Abdul Rahim bin Haji Nik, Timbalan Ketua Setiausaha Alam Sekitar, Kementerian Sumber Asli dan Alam Sekitar (**Rajah 5.1**).

Inter- Varsity Environmental Debate

Since 1991, the Environmental Debate for Institution of Higher Learning had been organized annually by the Department of Environment in collaboration with the Ministry of Higher Education, Malaysian Universities Debate Council (MADUM) and Dewan Bahasa dan Pustaka.

The Inter-Varsity Environmental Debate was conducted in a parliamentary manner and the bracket power match system was adopted in the preliminary rounds to determine whether a team is in the preposition or opposition side. The ranking of each team was based on several criteria such as “winner/loser”, jury, margin and overall score.

All teams took part in the preliminary six (6) rounds. The eight (8) highest ranking teams were then selected to compete in the Quarter-Finals, out of which four (4) qualified for the Semi-Finals and eventually two (2) teams entered the Finals.

The 21st Inter Varsity Environmental Debate which was participated by 24 institutions of higher learning was held in University Teknikal Malaysia Melaka (UTeM) from 23-27 September 2011. About 500 guests attended the Finals of the 2011 Debate held at Dewan Besar, UTeM between University of Malaya team (UM) and Islamic Science University of Malaysia team (USIM).

The USIM team emerged the overall winner and received the Minister of Natural Resources and Environment Challenge Trophy, a cash prize of RM8,000.00 and a certificate of participation. Mohd Ikhwan Bin Rosseli of USIM emerged as the Best Debater and received the Director General of Environment Trophy, together with a cash prize of RM1,500.00. The prizes were given out by YBhg. Dr. Abdul Rahim bin Haji Nik, the Deputy Secretary General (Environment), Ministry of Natural Resources and Environment (**Figure 5.1**).

Rajah 5.1 JAS: Pusingan Pertandingan Debat Alam Sekitar Antara Institusi Pengajian Tinggi (IPT)
Figure 5.1 DOE: The Round of the Inter-Varsity Environmental Debate among Institutions of Higher Learning.

PERINGKAT AWAL / PRELIMINARY ROUNDS

Pusingan Pertama / First Round:
BENCANA ALAM MENGERATKAN HUBUNGAN ANTARABANGSA

Pusingan Kedua / Second Round:
PERJUANGAN AKTIVITIS ALAM SEKITAR TIDAK SIA-SIA

Pusingan Ketiga / Third Round
LOJI JANAKUASA NUKLEAR DI MALAYSIA : SATU KEPERLUAN

Pusingan Keempat / Fourth Round
TEKNOKRAT ALAM SEKITAR IBARAT TIKUS MEMBAIKI LABU

Pusingan Kelima / Fifth Round
DUNIA MEMERLUKAN TEKNOLOGI BIOFUEL

Pusingan Keenam / Sixth Round
PERDAGANGAN KARBON MENJUAL ALAM SEKITAR

PERINGKAT SUKU AKHIR / QUARTER FINALS
KEMISKINAN PUNCA PENCEMARAN ALAM SEKITAR

USIM lwn/vs UTP	USM lwn/vs **UIAM**	UMP lwn/vs **UMS**	**UM** lwn/vs UiTM

PERINGKAT SEPARUH AKHIR / SEMI FINALS
KUASA BESAR TIDAK SERIUS MENANGANI PEMANASAN GLOBAL

UIAM lwn/vs **USIM**	**UM** lwn/vs UMS

PERINGKAT AKHIR / FINAL
KELESTARIAN ALAM SEKITAR MEMBINA KETAMADUNAN BANGSA

USIM lwn/vs UM

** Nota: Pasukan yang digelapkan menang dalam perdebatan*
** Note: Bold Team win in debating*

Hadiah kepada johan dan naib johan telah disampaikan oleh YBhg. Dr. Abdul Rahim bin Haji Nik, Timbalan Ketua Setiausaha Alam Sekitar, Kementerian Sumber Asli dan Alam Sekitar.
Prizes to the winner and runner-up was presented by YBhg. Dr. Abdul Rahim bin Haji Nik, the Deputy Secretary General (Environment), Ministry of Natural Resources and Environment.

Kem Pemimpin Muda Prihatin Air

Kem Pemimpin Muda Prihatin Air merupakan program tahunan yang dianjurkan di bawah Jawatankuasa Pendidikan, Latihan dan Penerangan Awam (JKPLPA) UNESCO-International Hidrological Programme (IHP) Malaysia. Tujuan program ini adalah untuk meningkatkan kesedaran dan pendidikan secara berterusan kepada para pelajar tentang pengurusan sumber air secara bersepadu melibatkan pelbagai agensi kerajaan dan institusi pengajian tinggi yang menjadi rakan UNESCO-IHP Malaysia. Program ini diadakan dalam bentuk ceramah/taklimat dan *hands-on training* yang melibatkan aktiviti seperti ujian kualiti air, kajian mineral dan geologi, kajian kehidupan akuatik (bioindicator) dan kajian tumbuhan di tepian sungai secara berkumpulan.

Pada tahun 2011, Jabatan Alam Sekitar telah menyertai tiga (3) buah kem yang disertai oleh 300 orang pelajar sekolah menengah seluruh Malaysia dan 50 orang fasilitator yang terdiri daripada pelbagai

Water Watch Programme for Young Leaders

The Water Watch Programme for Young Leaders is an annual program organized under the Education, Training and Public Information (JKPLPA) UNESCO-International Hydrological Programme (IHP) Malaysia. The objective of this Programme is to raise awareness and continuous education to students on the integrated water resources management involving various government agencies and institutions of higher learning. This programme is held in the form of lectures / briefings and hands-on activities such as water quality testing, the study of minerals and geology, aquatic life (bioindicator) and plants on the river banks.

In 2011, the Department of Environment participated in three (3) camps attended by 300 secondary school students throughout Malaysia and 50 facilitators from different government agencies and institutions of higher

agensi kerajaan dan institusi pengajian tinggi. Di akhir program ini, panel khas akan menilai kefahaman para peserta menerusi persembahan kumpulan dalam bentuk sketsa.

learning. At the end of the programme, a special panel evaluated the participants' understanding through group presentations in the form of sketches.

Jadual 5.1 JAS: Senarai Program Kem Pemimpin Muda Prihatin Air Peringkat Kebangsaan Tahun 2011

Table 5.1 DOE: List of Water Watch Programmes for Young Leaders, National Level, 2011

Program / Programme	Tempat / Place	Peserta / Participants
Kem Pemimpin Muda Prihatin Air Peringkat Kebangsaan Tahun 2011 / Water Watch Programme for Young Leaders, National Level 2011	Kem PLKN Tasik Chini, Pahang / PLKN Camp, Tasik Chini, Pahang	100 orang pelajar dari negeri Johor, Selangor dan Pahang / 100 students from Johor, Selangor and Pahang
Kem Pemimpin Muda Prihatin Air Peringkat Zon Borneo / Water Watch Programme for Young Leaders , Borneo Zone	Kampung Sukan PETRONAS, Miri, Sarawak / PETRONAS Sports Village, Miri, Sarawak	100 orang pelajar dari Miri, Sarawak 100 student from Miri, Sarawak
Kem Pemimpin Muda Prihatin Air Kebangsaan Peringkat Zon Selatan / Water Watch Programme for Young Leaders, North Zone	Kem Bina Negara Ulu Sepri, Rembau, Negeri Sembilan / Nation Building Camp, Ulu Sepri, Rembau, Negeri Sembilan	100 orang pelajar dari Negeri Sembilan, Johor dan Selangor / 100 students from Negeri Sembilan, Johor and Selangor

Peserta Menjalankan Kajian Kualiti Air Sungai
Participants Conducting Water Quality Test

Persembahan Sketsa oleh Peserta
Sketch Performance by Participants

Sekolah Lestari-Anugerah Alam Sekitar

Program Sekolah Lestari-Anugerah Alam Sekitar telah dilancarkan pada 27 Januari 2005, merupakan program anjuran bersama Jabatan Alam Sekitar dan Kementerian Pelajaran Malaysia dengan sokongan teknikal daripada Institut Alam Sekitar dan Pembangunan (LESTARI), Universiti Kebangsaan Malaysia (UKM). Program ini berkonsepkan pendekatan menyeluruh yang melibatkan semua lapisan sekolah bersama keluarga, komuniti setempat, kerajaan, pihak swasta dan badan bukan kerajaan. Konsep ini menitikberatkan pendekatan bersepadu dalam pengurusan, kurikulum, kokurikulum dan penghijauan sekolah.

Majlis Penganugerahan Sekolah Lestari 2009/2010 telah diadakan pada 16 Jun 2011 bersempena Sambutan Hari Alam Sekitar Sedunia di SM St. Michael, Penampang, Sabah. Majlis telah disempurnakan oleh Y.B. Tan Sri Datuk Seri Panglima Joseph Kurup, Timbalan Menteri Sumber Asli dan Alam Sekitar dan Y.B. Datuk Masidi Manjun, Menteri Pelancongan, Kebudayaan dan Alam Sekitar Negeri Sabah.

SM St. Michael, Penampang (kategori sekolah menengah) dan SJK (C) Tung Hua, Sibu (kategori sekolah rendah) telah dinobatkan sebagai penerima Anugerah Sekolah Lestari 2009/2010. Kedua-dua sekolah ini menerima sijil dan plak yang ditandatangani oleh Menteri Sumber Asli dan Alam Sekitar dan Menteri Pelajaran Malaysia beserta wang tunai RM10,000.00.

Pada tahun 2011, program ini telah dimulakan dengan dua (2) siri Bengkel Penambahbaikan Kriteria Penilaian SLAAS yang telah diadakan pada 24 Februari 2011 dan 8 Mac 2011. Bengkel ini telah dihadiri oleh wakil dari Kementerian Pelajaran, LESTARI UKM, panel penilai kebangsaan, pihak swasta dan badan bukan kerajaan. Hasil dari perbincangan, kriteria penilaian baru telah dibentuk dan komponen kurikulum akan mula dinilai dalam sesi penilaian SLAAS 2011/2012.

Satu (1) Bengkel Promosi SLAAS 2011/2012 Peringkat Kebangsaan telah diadakan pada 20-22 April 2011 di Hotel Grand Paragon, Johor Bahru. Seramai 25 orang pegawai dari Jabatan Alam Sekitar Negeri dan Jabatan Pelajaran Negeri seluruh Malaysia telah

Sustainable School-Environment Award

The Sustainable School - Environment Award programme which was launched on 27 January 2005 is a programme organized by the Department of Environment and the Ministry of Education with technical support from the Institute of Environment and Development (LESTARI), Universiti Kebangsaan Malaysia (UKM). The concept of this programme was hinged on the integrated approach, which involves the school community as a whole, their families, local communities, government, private sector and non-governmental organizations in four (4) components which are management, curriculum, co-curriculum and greening activities.

The Sustainable School 2009/2010 Award Giving Ceremony was held on 16 June 2011 in conjunction with World Environment Day Celebration. The ceremony was held at SM St. Michael, Penampang, Sabah and was officiated by Y.B. Tan Sri Datuk Seri Panglima Joseph Kurup, Deputy Minister of Natural Resources and Environment together with Y.B. Datuk Masidi Manjun, Minister of Tourism, Cultural and Environment Sabah.

The Sustainable School Award 2009/2010 was awarded to SM St. Michael, Penampang (secondary school category) and SJK (C) Tung Hua, Sibu (primary school category). Each school received a plaque and certificate signed by the Minister of Natural Resources and Environment and the Minister of Education with a cash prize of RM10,000.00.

In 2011, this programme kicked off with two (2) series of Improvement of Evaluation Criteria of Sustainable School Workshop which were held on 24 February 2011 and 8 March 2011. These workshops were attended by representatives from Ministry of Education, LESTARI UKM, the national assessment panel, private sector and non-governmental organizations. From the outcome of the workshops, the new evaluation criteria were developed and the curriculum component to be evaluated in SLAAS 2011/2012.

A Promotional Workshop on SLAAS 2011/2012 was held on 20-22 April 2012 at Grand Paragon Hotel, Johor Bahru. Twenty-five (25) participants from all State DOE Offices and State Education Departments attended this workshop with the purpose to promote

menghadiri bengkel ini. Para peserta telah dilatih untuk mempromosikan program SLAAS kepada sekolah di negeri masing-masing. Selain itu, peserta juga telah didedahkan dengan kriteria penilaian SLAAS yang baru.

Pada tahun 2011 juga, sebanyak 673 buah sekolah terpilih dari seluruh Malaysia telah menerima *seed money* bagi membolehkan pihak sekolah menjalankan aktiviti-aktiviti bertemakan alam sekitar di sekolah masing-masing. Penilaian bagi memilih tiga (3) projek terbaik ini telah dijalankan di peringkat negeri dan peringkat kebangsaan dari bulan September hingga Oktober 2011. Majlis penyampaian hadiah kepada Projek Terbaik Sekolah Lestari di bawah Program Rakan Alam Sekitar telah diadakan semasa Sambutan Minggu Alam Sekitar Malaysia Peringkat Kebangsaan pada 18 Oktober 2011 di Taman Tamadun Islam, Kuala Terengganu. Majlis telah disempurnakan oleh Y.B. Dato Sri Douglas Uggah Embas, Menteri Sumber Asli dan Alam Sekitar.

schools at the respective states to participate in this programme. In addition, participants were also introduced to the new evaluation criteria of SLAAS.

In 2011, a total of 673 schools were selected throughout Malaysia to receive seed money to enable the schools to carry out environmental activities. The selection of the three (3) best projects were carried out at the state and national level from September to October 2011. The prize giving ceremony to the Best Project of the Sustainable School under the Rakan Alam Sekitar Programme was held during the Malaysia Environment Week Celebration on 18 October 2011 at Taman Tamadun Islam, Kuala Terengganu. The ceremony was officiated by Y.B. Dato Sri Douglas Uggah Embas, Minister of Natural Resources and Environment.

PENERIMA-PENERIMA ANUGERAH SEKOLAH LESTARI 2009/2010
RECIPIENTS SUSTAINABLE SCHOOL AWARD 2009/2010

Jadual 5.2 JAS: Anugerah Sekolah Lestari 2009/2010 (EMAS)
Table 5.2 DOE: Sustainable School Award 2009/2010 (GOLD)

Kategori / Category	Sekolah / School
Sekolah Menengah / Secondary School	SM St. Michael Penampang, Sabah
Sekolah rendah / Primary School	SJK (C) Tung Hua, Sibu, Sarawak

PENSIJILAN KHAS PERINGKAT KEBANGSAAN
NATIONAL LEVEL SPECIAL MENTION

Jadual 5.3 JAS : Kategori Sekolah Menengah
Table 5.3 DOE : Secondary School Category

Kategori / Category	Sekolah / School
Pengurusan / Management	SMK Lopeng Tengah, Miri, Sarawak
Penghijauan / Greening	SMK Bandar Baru Sungai Long, Kajang, Selangor
Kokurikulum-Sungai / Cocurriculum - River	SMK Datuk Undang Abdul Manap, Johol, Negeri Sembilan
Jaringan Luar / Networking	SMK Sultanah Engku Tun Aminah, Johor Bahru,Johor
Keusahawanan Sosial / Social Entrepreneurship	SMK Kampong Kastam, Butterworth, Pulau Pinang
Pembudaya Hidup Lestari di Kalangan Warga Sekolah / Inculcate Sustainable Living Among The School Members	SM St. Michael, Penampang, Sabah

Jadual 5.4 JAS: Kategori Sekolah Rendah
Table 5.4 DOE: Primary School Category

Kategori / Category	Sekolah / School
Pengurusan / Management	SK Kuala Besut, Besut, Terengganu
Penghijauan / Greening	SK Ledang, Tangkak, Johor
Jaringan Kitar Semula / Recycle Networking	SK Sri Kelana, Petaling Jaya, Selangor
Pembudaya Hidup Lestari di Kalangan Warga Sekolah / Inculcate Sustainable Living Among School Members	SJK (C) Tsun Jin, Kuala Lumpur
Pembudaya Hidup Lestari di Kalangan Warga Sekolah / Inculcate Sustainable Living Among School Members	SJK (C) Tung Hua, Sibu, Sarawak

* *Sekolah yang berjaya telah menerima plak yang ditandatangani bersama oleh Ketua Pengarah Alam Sekitar Malaysia dan Ketua Pengarah Pelajaran Malaysia*

* *Winning schools received a plaque signed by the Director General of Environment and the Director General of Education*

PENSIJILAN PERINGKAT KEBANGSAAN (PERAK)
NATIONAL LEVEL CERTIFICATION (SILVER)

Jadual 5.5 JAS: Kategori Sekolah Menengah
Table 5.5 DOE: Secondary School Category

Negeri / State	Sekolah / School
Kedah	SMK Tunku Putra, Padang Mat Sirat
Pahang	SMK Tengku Afzan, Kuantan
Kelantan	SMK Kota, Kota Bharu
Johor	SMK Sultanah Engku Tun Aminah, Johor Bahru
Perak	SMK Pengkalan, Lahat
Selangor	SMK Bandar Baru Sungai Long, Kajang
Negeri Sembilan	SMK Datuk Undang Abdul Manap, Johol
Terengganu	SMK Kerteh, Kerteh
Sarawak	SMK Lopeng Tengah, Miri
Pulau Pinang	SMK Kampong Kastam, Butterworth
Sabah	SM St. Michael, Penampang
Melaka	SMK Sungai Rambai, Sungai Rambai
W.P. Kuala Lumpur	SMK Zon R1 Wangsa Maju, Setapak

Jadual 5.6 JAS: Kategori Sekolah Rendah
Table 5.6 DOE: Primary School Category

Negeri / State	Sekolah / School
Kelantan	SK Hamzah (2), Machang
Johor	SK Ledang, Tangkak
Perak	SK Sungai Setar, Parit Buntar
Perlis	SK Putra, Kangar
Selangor	SK Sri Kelana, Petaling Jaya
Terengganu	SK Kuala Besut, Besut
Sarawak	SJK (C) Tung Hua, Sibu
Sabah	SJK (C) Yuk Chin, Tawau
Melaka	SK Convent Infant Jesus (1), Melaka
W.P. Kuala Lumpur	SJK (C) Tsun Jin, Kuala Lumpur

* *Sekolah yang berjaya telah menerima wang tunai RM2,000.00 dan sijil yang ditandatangani bersama oleh Ketua Pengarah Alam Sekitar Malaysia dan Ketua Pengarah Pelajaran Malaysia*

* *Winning schools received cash of RM2,000.00 and certificate signed by the Director General of Environment and the Director General of Education*

PENSIJILAN PERINGKAT NEGERI (GANGSA)
STATE LEVEL CERTIFICATION (BRONZE)

Jadual 5.7 JAS: Kategori Sekolah Menengah
Table 5.7 DOE: Secondary School Category

Negeri / State	Sekolah / School
Sarawak	SMK Tun Abang Haji Openg, Petra Jaya
	SMK Siburan, Kuching
	SMK Padawan, Kuching
	SMK Bandar Sibu, Sibu
	SMK Luar Bandar No. 1 Sibu, Sibu
	SMK Mukah, Mukah
Sabah	SMK Tawau, Tawau
	SMK Teknik Keningau, Keningau
	SMK Majakir, Papar
	SMK Taun Gusi, Kota Belud
Johor	SMK LKTP Pemanis, Segamat
	SMK Permas Jaya, Masai
Pahang	SMK Chanis, Muadzam Shah
Kedah	SMK Teloi Kanan, Kuala Ketil
Pulau Pinang	SMK (P) Sri Mutiara, Pulau Pinang
	SMK Jelutong, Pulau Pinang
	SMK (P) St. George, Pulau Pinang
Kelantan	SMK Zainab, Kota Bharu
	SMK Tendong, Pasir Mas

Jadual 5.8 JAS: Kategori Sekolah Rendah
Table 5.8 DOE: Primary School Category

Negeri / State	Sekolah / School
Sarawak	SJK(C) Ming Tee, Bitangor
	SK Dua Sungai Mukah, Mukah
	SK St. Joseph Kuching, Kuching
Sabah	SJK(C) Sin Hwa, Tawau
	SJK(C) Chi Hwa, Sandakan
	SJK(C) Siew Ching, Lahad Datu
	SK Masalog, Kota Marudu
	SK Kauluan Tuaran, Tuaran
Johor	SK Laksamana, Kota Tinggi
Selangor	SK Seri Utama, Sungai Besar

Majlis Penganugerahan Sekolah Lestari 2009/2010 pada 16 Jun 2011 di SM St Michael, Penampang, Sabah.
The Sustainable School 2009/2010 Award Giving Ceremony on 16 June 2011 at SM St. Michael, Penampang, Sabah.

Projek Wira Alam

Projek Wira Alam (PWA) telah dilancarkan pada 5 Jun 1998 bertujuan untuk memotivasikan para pelajar untuk memberikan sumbangan aktif dalam aktiviti pemeliharaan dan pemuliharaan alam sekitar ke arah meningkatkan kualiti alam sekitar

Projek ini merupakan anjuran Jabatan Alam Sekitar dengan kerjasama Kementerian Pelajaran Malaysia dan Persatuan Pencinta Alam Malaysia. Projek ini terbahagi kepada tiga tahap iaitu Wira Diri (Tahap 1), Wira Komuniti (Tahap 2) dan Wira Alam (Tahap 3). Setiap pelajar perlu menyelesaikan tugasan yang ditetapkan di dalam buku aktiviti pada setiap tahap sebelum ke peringkat seterusnya.

Pada tahun 2011, sebanyak 1,614 permohonan baru dari pelajar-pelajar telah diterima untuk menyertai projek ini. Seramai 295 orang pelajar telah lulus Wira Diri (Tahap 1) dan menerima sijil dan *organizer* Wira Diri. Seramai 197 orang pelajar lulus Wira Komuniti (Tahap 2) dan menerima sijil, beg, t-shirt dan topi Wira Komuniti. Pelajar-pelajar ini juga telah dibekalkan Buku Aktiviti Wira Alam (Tahap 3) untuk diselesaikan. Pelajar-pelajar yang lulus cemerlang Wira Alam (Tahap 3) akan menerima Anugerah Wira Alam, wang tunai RM300, vest dan plak Wira Alam.

Satu (1) Bengkel Promosi Projek Wira Alam juga telah diadakan pada 20-21 Julai 2011 di Kampung Sukan Petronas, Miri, Sarawak. Bengkel ini telah diadakan bersama dengan Kem Pemimpin Muda Prihatin Air Zon Borneo. Seramai 100 orang pelajar dan 10 orang guru pengiring dari 10 buah sekolah telah menghadiri bengkel ini. Antara aktiviti yang telah dijalankan semasa bengkel ini adalah taklimat berkenaan Projek Wira Alam, aktiviti rantaian dan siratan makanan, penggunaan tenaga, permainan alam sekitar dan terarium.

Wira Alam Project

The Wira Alam Project (PWA) was launched on 5 June 1998 to motivate students to actively participate in environmental conservation activities to protect and improve of the environment quality.

This project was organized by the Department of Environment in collaboration with the Ministry of Education and Malaysian Nature Society. This project is divided into three stages: Wira Diri (Level 1), Wira Komuntiti (Level 2) and Wira Alam (Level 3). Each participating student has to complete the tasks provided in the activity book in each level before advancing into the next level.

In 2011, 1,614 new applications were received to participate in this project. A total of 295 students had successfully completed Wira Diri (Level 1) and each received a certificate and a Wira Diri's Organizer. A total of 197 students completed Wira Komuniti (Level 2) and each received a certificate, a Wira Komuniti's bag, t-shirt and cap. These students were also given the Wira Alam's Activity Book (Level 3) to be completed. Students that had completed the Wira Alam (Level 3) successfully would receive the Wira Alam Award, a cash prize of RM300, Wira Alam's vest and a plaque.

A Promotional Workshop on Wira Alam Project was held on 20-21 July 2011 at Kampung Sukan Petronas, Miri, Sarawak. This workshop was held together with Water Watch Camp for Young Leaders Borneo Zone. A total of 100 students and 10 teachers from 10 schools attended this workshop. Among the activities carried out during this workshop were briefing on the Wira Alam Project, food chain/web activity, energy consumption, environmental games and terrarium making.

Bengkel Promosi Projek Wira Alam pada 20-21 Julai 2011 di Kampung Sukan Petronas, Miri, Sarawak.
The Promotional Workshop on Wira Alam Project held on 20-21 July 2011 at Kampung Sukan Petronas, Miri, Sarawak.

Modul Kesedaran Alam Sekitar Prasekolah Lestari 2011

Program Modul Kesedaran Alam Sekitar Prasekolah Lestari telah diperkenalkan pada 6 Mac 2010. Ianya bertujuan memperkenalkan dan mendidik para guru TADIKA/TASKA dan kanak-kanak prasekolah berkaitan pemeliharaan dan pemuliharaan alam sekitar. Modul ini terbahagi kepada dua set iaitu set Tadika (5-6 tahun) dan set Taska (3-4 tahun). Setiap set ini mengandungi lima komponen utama iaitu air, udara, haiwan, tumbuhan dan kitar semula dan juga buku panduan guru termasuk cd.

Sustainable Preschool Environmental Awareness Module 2011

The Sustainable Preschool Environmental Awareness Module was introduced on 6 March 2010. The aim of this module is to introduce and educate the TADIKA/TASKA's teachers and preschool children about the preservation and conservation of the environment. These modules consist of two sets of five (5) books each: one set is for TADIKA (5-6 years) and one set is for TASKA (3-4 years). The five main topics are water, air, animals, plants and recycling as well as a teacher's guide including a compact disk of the module.

Pada tahun 2011, sebanyak dua (2) seminar untuk guru dan satu program kanak-kanak telah diadakan. Seminar-seminar yang diadakan adalah bertujuan untuk memperkenalkan dan membimbing guru-guru untuk mendidik kanak-kanak prasekolah berkaitan alam sekitar manakala program kanak-kanak pula diadakan bertujuan untuk mendidik kanak-kanak untuk mengenali komponen-komponen alam sekitar dan mencintai alam sekitar kita.

Dua (2) seminar yang telah diadakan adalah seperti berikut :

- Seminar Pengenalan Modul Kesedaran Alam Sekitar Prasekolah Lestari Siri 1/2011 - Zon Utara pada 21 Mac 2011 yang bertempat di Dewan Rafflesia, Kompleks Belia dan Sukan Negeri Kedah, Alor Setar
- Seminar Pengenalan Modul Kesedaran Alam Sekitar Prasekolah Lestari Siri 2/2011 – Zon Selatan yang diadakan pada 4 Mei 2011 di Dewan Kuliah ADTEC, Alor Gajah, Melaka.

Seterusnya program ketiga yang telah diadakan ialah Program Sehari Bersama Kanak-Kanak dan Alam Sekitar 2011 pada 29 Oktober 2011 di Kompleks 3C, Majlis Perbandaran Subang Jaya, Selangor. Program ini telah disertai oleh 77 orang kanak-kanak daripada Pusat Pengembangan Kanak-Kanak 3C dan juga Tadika Kemas Angsana, Subang Jaya.

In 2011, two (2) seminars for teachers and a children's program were held. The teachers' seminars were held to introduce the module and guide teachers on how to teach preschool children about the environment while the children's program is aimed to educate children on how to identify the components of the environment and to love the environment.

The details of the two (2) seminars are as follow:

- An Introduction to Sustainable Preschool Environmental Awareness Module Series 1/2011- Northern Zone on 21 March 2011 and was held at Rafflesia Hall, Youth and Sports Complex of Kedah, Alor Setar, Kedah
- An Introduction to Sustainable Preschool Environmental Awareness Module Series 2/2011 - Southern Zone was held on 4 May 2011 at Lecture Hall, ADTEC, Alor Gajah, Malacca.

The third program, A Day With Children and Environment 2011 was held on 29 October 2011 at 3C Complex, MPSJ, Selangor. This program was attended by a total of 77 preschool children from the Children Creative Center (3C), MPSJ and Tadika Kemas Angsana, Subang Jaya.

Program Sehari Bersama Kanak-Kanak dan Alam Sekitar, 2011
A Day With Children and Environment Program, 2011

Bengkel Penilaian Tahap Keberkesanan Program Pendidikan dan Kesedaran Alam Sekitar Siri 1, 2 dan 3/2011

Pada tahun 2011, Jabatan Alam Sekitar dengan kerjasama Institut Alam Sekitar dan Pembangunan (LESTARI), UKM menganjurkan tiga (3) bengkel untuk sesi percambahan minda mengenai pembentukan Indeks Kesedaran dan Komitmen Alam Sekitar. Indeks ini akan digunakan untuk menilai dan menentukan kesedaran dan komitmen alam sekitar di kalangan rakyat di negara ini. Tiga (3) bengkel tersebut telah diadakan seperti berikut:

- Bengkel pertama telah diadakan dari 26 hingga 28 April 2011 di Port Dickson dan dihadiri oleh 32 peserta yang terdiri dari agensi-agensi kerajaan yang terlibat dalam program pendidikan dan kesedaran alam sekitar.
- Bengkel kedua telah diadakan dari 27 hingga 29 September 2011 di Shah Alam, Selangor dan dihadiri oleh 27 peserta termasuk 15 peserta dari 12 pertubuhan bukan kerajaan (NGO) yang terlibat dalam program pendidikan dan kesedaran alam sekitar.
- Bengkel ketiga telah diadakan pada 30 November 2011 di Bilik Cempaka, Jabatan Alam Sekitar dan dihadiri oleh 25 peserta dari sektor perniagaan dan industri.

Bengkel *Retreat* Penilaian Tahap Keberkesanan Program Pendidikan dan Kesedaran Alam Sekitar

Bengkel ini telah diadakan di Concorde Inn, Sepang pada 7-9 Disember 2011 dan dihadiri seramai 18 orang peserta termasuk Pegawai JAS, LESTARI, wakil dari Jabatan Perangkaan Malaysia serta wakil dari Institut Integriti Malaysia (IIM).

Tujuan bengkel *Retreat* ini dijalankan bagi merumuskan kesemua maklumat yang diperoleh daripada ketiga-tiga bengkel yang diadakan pada tahun 2011.

Assessment on the Effectiveness of Environmental Education and Awareness Programme Workshop Series 1, 2 and 3/2011

In 2011, the Department of Environment in collaboration with Institute for Environment and Development (LESTARI), UKM conducted three (3) workshops to develop an environmental education and awareness index. The new index will be used to evaluate and determine the environmental commitment and awareness level among citizens in the country. The three (3) workshops are as follow:

- The first workshop was held from 26 to 28 April 2011 in Port Dickson and was attended by 32 participants, mainly from related environmental government agencies.
- The second workshop was held from 27 to 29 September 2011 in Shah Alam, Selangor and was attended by 27 participants including 15 participants from related environmental non-government organizations (NGOs).
- The third workshop was held on 30 November 2011 at Bilik Cempaka, Department of Environment and was attended by 25 participants from industry and business sectors.

Assessment on the Effectiveness of Environmental Education and Awareness Programme Retreat Workshop

The workshop was held on 7-9 December 2011 at Concorde Inn, Sepang and was attended by 18 participants including DOE and LESTARI officers. Two (2) presentations were given by Department of Statistics and Malaysian Institute of Integrity.

The purpose of this Retreat Workshop was to summarize and conclude the outcome of the three (3) workshops conducted in 2011.

Bengkel Penilaian Tahap Keberkesanan Program Pendidikan dan Kesedaran 1/2011
Assessment on the Effectiveness of Environmental Education and Awareness Workshop Series 1/2011

Bengkel Penilaian Tahap Keberkesanan Program Pendidikan dan Kesedaran 2/2011
Assessment on the Effectiveness of Environmental Education and Awareness Workshop Series 2/2011

Bengkel Penilaian Tahap Keberkesanan Program Pendidikan dan Kesedaran 3/2011
Assessment on the Effectiveness of Environmental Education and Awareness Workshop Series 3/2011

Bengkel Retreat Penilaian Tahap Keberkesanan Program Pendidikan dan Kesedaran
Assessment on the Effectiveness of Environmental Education and Awareness Programme Retreat Workshop

SEBARAN MAKLUMAT ALAM SEKITAR
ENVIRONMENTAL INFORMATION DISSEMINATION

Maklumat Alam Sekitar

Jabatan Alam Sekitar terus meningkatkan usaha dalam menerbitkan dan menyebarkan maklumat alam sekitar bagi mempromosikan kesedaran dan pendidikan alam sekitar. Sepanjang tahun 2011, sejumlah 531,000 naskhah bahan bercetak telah diterbitkan untuk edaran. Bahan-bahan terbitan tersebut terdiri daripada Laporan Kualiti Alam Sekeliling 2010, Laporan Tahunan Jabatan Alam Sekitar 2010, buku Kompendium 2011, majalah IMPAK, majalah ERA HIJAU, Kalendar Jabatan 2012 dan cetakan semula lapan (8) risalah;

(i) Kawalan Pelepasan Daripada Enjin Petrol
(iii) Kawalan Pelepasan Daripada Enjin Diesel
(iii) Jerebu Fenomena Pencemaran Udara
(iv) Larangan Pembakaran Sampah
(v) Lindungi Lautan Kita
(vi) Hentikan Pencemaran sungai
(vii) Pelupusan Haram Buangan Terjadual
(viii) *E-Waste*

Bahan-bahan bercetak tersebut diedarkan kepada pelbagai agensi kerajaan, perpustakaan-perpustakaan, pusat rujukan, institusi pendidikan, persatuan bukan kerajaan dan orang perseorangan.

Pameran Alam Sekitar

Pada tahun 2011, Ibu Pejabat Jabatan Alam Sekitar (JAS) telah menyertai 14 pameran bertemakan alam sekitar yang dianjurkan oleh Jabatan/Agensi Kerajaan, Badan Berkanun, Pertubuhan Bukan Kerajaan, Sektor Swasta, Institut Pengajian Tinggi dan Sekolah. Ini adalah usaha berterusan JAS dalam mempromosikan pendidikan dan kesedaran alam sekitar secara dekat kepada masyarakat. Antara perkhidmatan yang diberikan semasa sesi pameran adalah khidmat nasihat, pendaftaran ahli Rakan Alam Sekitar, edaran bahan-bahan promosi (brosur, beg mesra alam dan sebagainya), persembahan video, permainan alam sekitar dan demonstrasi produk mesra alam (eco-enzyme).

- Pameran sempena Sambutan Hari Kelawar , Zoo Negara
  15 Januari 2011

Environmental Information

The Department of Environment intensified its efforts in 2011 to publish and distribute environmental information as part of a comprehensive programme to promote environmental awareness and education. In 2011, 531,000 copies of information materials were published and distributed including the Environmental Quality Report 2010, the Annual Report 2010, Compendium 2011 booklet, IMPAK bulletin, ERA HIJAU bulletin, DOE Calendar 2012 and reprinting of eight (8) brochures namely;

(i) Emission Control From Petrol Engines
(iii) Emission Control From Diesel Engines
(iii) Haze Air Pollution Phenomena
(iv) Prohibition on Open Burning
(v) Protect Our Seas
(vi) Stop River Pollution
(vii) Illegal Dumping of Scheduled Waste
(viii) E-Waste

These printed materials were distributed to various government agencies, libraries, resource centres, educational institutions, non-governmental organizations and individuals.

Environmental Exhibitions

In 2011, Department of Environment (DOE) participated in 14 environmental exhibitions organized by Government agencies, statutory bodies, non-governmental organizations, private sector, institutions of higher learning and schools. This is DOE's initiative to promote education and environmental awareness among the public. During the exhibitions, activities such as consultation, registration of Rakan Alam Sekitar members, distribution of promotional materials (brochures, environmental friendly bags and others), video presentation, environmental games and demonstration of environmental friendly products (eco-enzyme) were conducted.

- Exhibition at "Sambutan Hari Kelawar" Zoo Negara
  15 January 2011

- Pameran sempena Kempen Persekitaran, Keselamatan & Kesihatan Pekerja, Sunway Construction Presint 7 & 8 Putrajaya
  26 Januari 2011
- Pameran sempena "Quality, Health, Safety and Environment (QHSE) Week", Petronas Management, Kajang
  9-10 Februari 2011
- Pameran sempena Hari Kehijauan Kelab, Fakulti Sains Universiti Malaya
  23-24 Februari 2011
- Pameran Sempena Program Kami Kasih, O.M Sayang, Universiti Teknologi Mara Puncak Alam
  10 Mac 2011
- Pameran sempena "Earth Day", Genting Highland
  23 April 2011
- Pameran Sambutan Hari Alam Sekitar Putrajaya Holding, Pullman Putrajaya Lakeside
  21 Jun 2011
- Pameran semasa Sambutan Minggu Alam Sekitar Malaysia 2011, Kuala Terengganu
  18 Oktober 2011
- Pameran sempena Kempen Persekitaran, Keselamatan & Kesihatan Pekerja 2011, KLCC
  1 November 2011
- Pameran semasa Hari Inovasi 2011 Peringkat Kementerian Sumber Asli Dan Alam Sekitar, Presint 4,
  14-15 November 2011
- Pameran semasa "Environmental Awareness Week 2011" Universiti Teknologi Mara, Shah Alam
  16-18 November 2011
- Pameran semasa 2011 Quality & Compliance Week, Johnson & Johnson Sdn. Bhd., Petaling Jaya
  22-25 November 2011
- Pameran sempena Hari Bersama Pelanggan Jabatan Alam Sekitar Putrajaya, Presint 4,
  8 Disember 2011
- Pameran semasa Eko Famili, Lembaga Penduduk dan Pembangunan Keluarga Negara (LPPKN), Presint 14C, Putrajaya,
  17 Disember 2011

- Exhibition at "Kempen Persekitaran, Keselamatan & Kesihatan Pekerja" Sunway Construction Precinct 7 & 8 Putrajaya
  26 January 2011
- Exhibition at Quality, Health, Safety and Environment (QHSE) Week, Petronas Management Kajang
  9-10 February 2011
- Exhibition at "Hari Kehijauan Kelab" Faculty of Sciences, University of Malaya
  23-24 February 2011
- Exhibition at "Program Kami Kasih, O.M Sayang" Universiti Teknologi Mara Puncak Alam
  10 March 2011
- Exhibition at Earth Day, Genting Highlands
  23 April 2011
- Exhibition at "Sambutan Hari Alam Sekitar Putrajaya Holding" Pullman Putrajaya Lakeside
  21 June 2011
- Exhibition at "Sambutan Minggu Alam Sekitar Malaysia 2011" Kuala Terengganu
  18 October 2011
- Exhibition at "Kempen Persekitaran, Keselamatan & Kesihatan Pekerja 2011", KLCC
  1 November 2011
- Exhibition at "Hari Inovasi 2011" Ministry of Natural Resources And Environment, Precinct 4,
  14-15 November 2011
- Exhibition at "Environmental Awareness Week 2011" Universiti Teknologi Mara, Shah Alam,
  16-18 November 2011
- Exhibition at "2011 Quality & Compliance Week" Johnson & Johnson Sdn. Bhd. Petaling Jaya,
  22-25 November 2011
- Exhibition at "Hari Bersama Pelanggan" Department of Environment, Precinct 4, Putrajaya,
  8 December 2011
- Exhibition at "Eko Famili" National Population & Family Development Board (LPPKN), Precinct 14C, Putrajaya,
  17 December 2011

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 2011, koleksi bahan rujukan adalah sebanyak 29,353 buah. Bilangan pengunjung ke perpustakaan adalah seramai 2,041 orang di mana 83% daripadanya adalah kakitangan dan pegawai-pegawai Kerajaan (**Rajah 5.2, 5.3** & **5.4**).

Aktiviti Perpustakaan

Pada tahun 2011, Perpustakaan-Enviro JAS Ibu Pejabat telah mengadakan Lawatan Sambil Belajar ke Pesta Buku Antarabangsa dan Perpustakaan JPM pada 21 April 2011 dan 20 Jun 2011. Lawatan ini telah disertai oleh pegawai-pegawai dari JAS Ibu Pejabat.

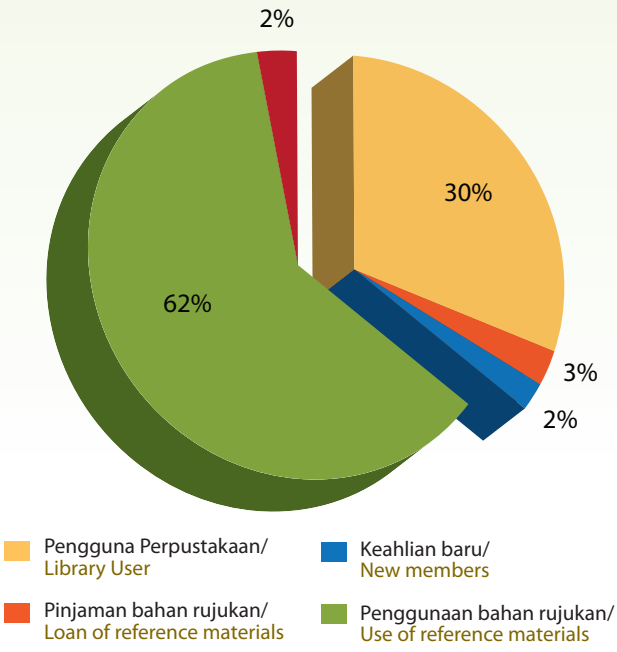
Enviro-Library Services

The Enviro-Library located at the DOE Head Office served as an important reference centre both for DOE staff and registered public users. As of 31 December 2011, the entire collection of reference materials totaled 29,353 items. The number of library users were 2,041 of which 83% were employees and government officers (**Figure 5.2, 5.3** & **5.4**).

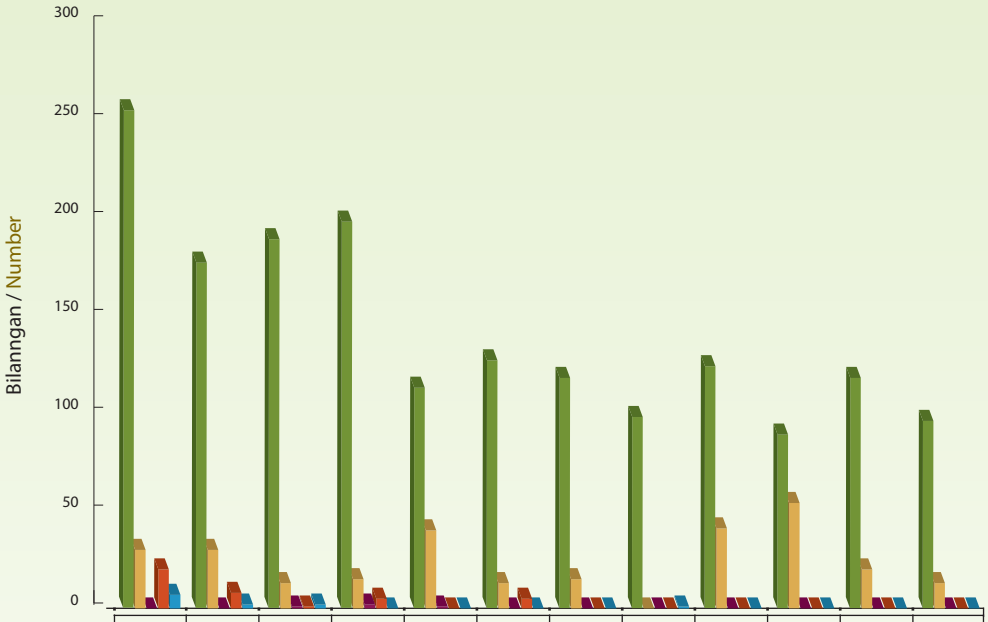
Enviro-Library Activities

In 2011, the DOE Enviro-Library Head Office organized two (2) study visits for its staff namely to the KL International Book Fair on 24 April 2011 and the JPM Library on 21 Jun 2011.

Pesta Buku Antarabangsa KL 2011
KL International Book Fair, 2011

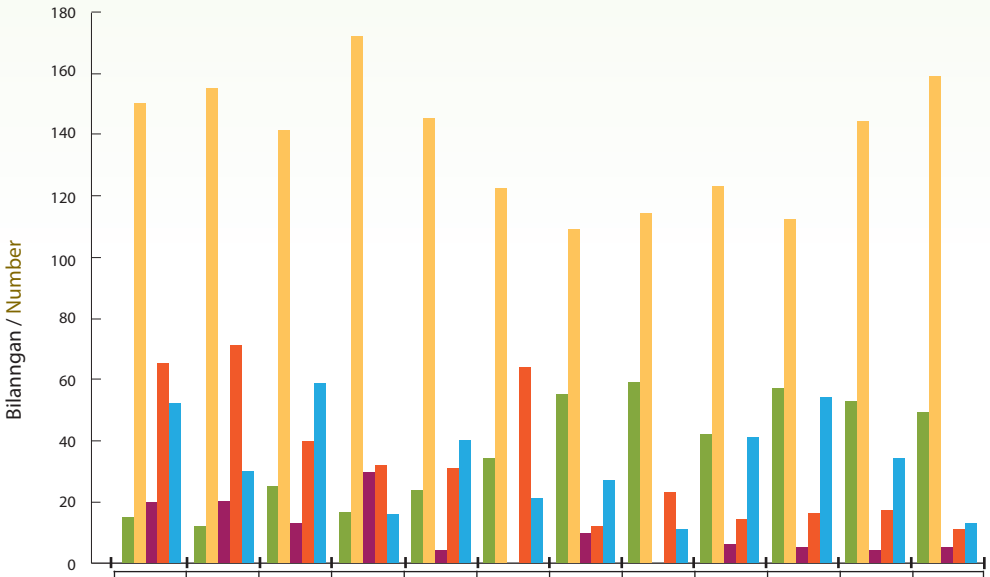


Rajah 5.2 JAS : Perkhidmatan Perpustakaan, 2011
Figure 5.2 DOE : Library Services, 2011



	Jan/ Jan	Feb/ Feb	Mac/ Mar	Apr/ Apr	Mei/ May	Jun/ June	Jul/ July	Ogos/ Aug	Sep/ Sept	Okt/ Oct	Nov/ Nov	Dis/ Dec
Kakitangan JAS/ JAS Officer	255	177	189	198	113	127	118	98	124	89	118	96
Pelajar/ Student	30	30	13	15	40	13	15	0	41	54	20	13
Kakitangan kerajaan/ Gov. Officer	0	0	1	2	1	0	0	0	0	0	0	0
Konsultan/ Consultant	20	8	1	5	0	5	0	0	0	0	0	0
Pensyarah/ Lecturer	7	2	2	0	0	0	0	1	0	0	0	0

Rajah 5.3 JAS: Bilangan Pengunjung Perpustakaan (Bulanan), 2011
Figure 5.3 DOE: Number of Library Users, (Monthly) 2011



	Jan/ Jan	Feb/ Feb	Mac/ Mar	Apr/ Apr	Mei/ May	Jun/ June	Jul/ July	Ogos/ Aug	Sep/ Sept	Okt/ Oct	Nov/ Nov	Dis/ Dec
Rujukan Atas Talian/ Online Reference	15	12	25	17	24	34	55	59	42	57	53	49
Suratkhabar/ News Paper	150	155	141	172	145	122	109	114	123	112	144	159
Pengguna Buku/ Users Book	20	20	13	30	4	0	5	0	6	5	4	5
Majalah / Magazine	65	71	40	32	31	64	12	23	14	16	17	11
Pengguna EIA/ Users EIA	52	30	59	15	40	21	27	11	41	54	34	13

Rajah 5.4 JAS: Bilangan Penggunaan Bahan Rujukan di Perpustakaan
Figure 5.4 DOE: Number of Reference Materials Use in Library

BAB 6 / CHAPTER 6

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

Malaysia - Indonesia

Satu delegasi yang terdiri daripada lima (5) orang pegawai kanan yang diketuai oleh Timbalan Menteri, Kementerian Lingkungan Hidup, Indonesia telah mengadakan lawatan ke Jabatan Alam Sekitar, Malaysia pada 28 Januari 2011. Lawatan ini bertujuan untuk bertukar maklumat mengenai kaedah yang digunakan bagi mencegah dan mengawal masalah pembakaran hutan dan jerebu merentas sempadan.

Malaysia – Emiriah Arab Bersatu (UAE)

Seramai 11 orang dari ZonesCorps, Emiriah Arab Bersatu (UAE) telah mengadakan lawatan sambil belajar ke JAS Malaysia, pada 15 Disember 2011. Tujuan lawatan tersebut adalah bagi mendapatkan maklumat dan pengetahuan berkenaan keselamatan alam sekitar khususnya yang melibatkan industri pembuatan di Malaysia. Selain itu, delegasi tersebut juga ingin mempelajari aspek pelaksanaan undang-undang dan pemantauan keselamatan alam sekitar.

Malaysia - Indonesia

A delegation consisting of five (5) senior officers led by the Deputy Minister, Ministry of Environment, Indonesia, visited the Department of Environment, Malaysia on 28 January 2011. The purpose of the visit was to exchange information on measures taken to prevent and control land and forest fires and transboundary haze pollution.

Malaysia – United Arab Emirates

A total of 11 people from the ZonesCorps, United Arab Emirates (UAE) visited the DOE Malaysia, on 15 December 2011. The purpose of this visit was to share information and knowledge on environmental safety, especially in the manufacturing industry in Malaysia. In addition, the delegation learned about the aspects of law enforcement and monitoring of environmental safety in Malaysia.

Lawatan Delegasi dari Syarikat ZoneCorps UAE ke JAS pada 15 Disember 2011
Visit by ZonesCorps, UAE to DOE on 15 December 2011

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

Bengkel ASEAN Eco-Schools Programme

Bengkel ASEAN *Eco-Schools Programme* telah diadakan pada 26 hingga 28 Jun 2011 di Kota Kinabalu, Sabah. Bengkel ini telah dianjurkan oleh Jabatan Alam Sekitar (JAS), dengan kerjasama ASEAN Secretariat, ASEAN-US Technical Assistance and Training Facility (US-TATF) dan Yayasan Hanns Seidel, dan telah dihadiri seramai 40 orang peserta termasuk wakil negara-negara ASEAN kecuali Myanmar.

Bengkel selama tiga hari ini dianjurkan untuk perkongsian maklumat berkenaan pelaksanaan konsep *Eco-School* di setiap negara ASEAN dan membentuk satu garis panduan serta kriteria bagi Program ASEAN *Eco-School* yang akan dijadikan rujukan kepada semua negara ASEAN.

Peserta bengkel ini juga turut dibawa ke SM St. Michael, Penampang, di mana sekolah ini telah memenangi Sekolah Lestari-Anugerah Alam Sekitar 2009/2010. Tujuan lawatan ini adalah untuk memberikan gambaran yang jelas terhadap pelaksanaan "Eco-School" kepada para peserta.

Workshop On ASEAN Eco-School Programme

The workshop was held from 26 to 28 June 2011 in Kota Kinabalu, Sabah. The workshop was organized by the Department of Environment (DOE) in collaboration with the ASEAN Secretariat, ASEAN-US Technical Assistance and Training Facility (US-TATF) and Hanns Seidel Foundation. It was attended by 40 participants from all ASEAN Member States (AMS) except Myanmar.

The three-day workshop was organized to share information and take stock of the existing national eco-schools criteria/programmes in ASEAN countries and also to develop regional eco-schools criteria/programme based on the commonalities of the national criteria/programmes.

On the second day of the workshop, DOE organized a visit to SM St. Michael, Penampang, Sabah which had won the Sustainable School-Environment Award 2009/2010. The visit gave the participants a good understanding of the sustainable activities/programmes conducted in this award-winning school.

Bengkel ASEAN Eco-Schools Programme, 26-28 Jun 2011
Workshop on ASEAN Eco-Schools Programme, 26-28 June 2011

Demonstrasi bebola tanah semasa lawatan ke SM St. Michael, Penampang
Mudball demonstration during visit to SM St. Michael, Penampang

BAB 7 / CHAPTER 7

PENGURUSAN TEKNOLOGI MAKLUMAT DAN KOMUNIKASI
INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) MANAGEMENT

Bahagian Teknologi Maklumat telah diberi tanggung-jawab untuk merancang, memperoleh dan melaksana teknologi maklumat dan komunikasi bagi meningkat-kan kecekapan dan keberkesanan pengurusan organisasi jabatan sekaligus menambahbaik sistem penyampaian perkhidmatan awam jabatan. Ini termasuklah melaksanakan perolehan peralatan, perkhidmatan dan infrastruktur ICT, membangun dan melaksanakan sistem-sistem aplikasi, serta membangunkan program latihan ICT.

Penarafan 5 Bintang Laman Web Jabatan Alam Sekitar

Laman Web Jabatan Alam Sekitar telah diberikan penarafan lima bintang dan menduduki ranking ketiga bagi Kategori 10 Laman Web Tertinggi Keseluruhan dalam Penilaian Portal dan Laman Web Sektor Awam Kerajaan Malaysia (MGPWA) 2011 yang dianjurkan oleh Multimedia Corporation Sdn Bhd (MDEC). Majlis penganugerahan tersebut diadakan sempena Seminar MGPWA 2011 yang diadakan di Pusat Konvensyen Putrajaya (PICC) pada 1 Disember 2011. Anugerah tersebut disampaikan oleh Ketua Setiausaha Negara, YBhg Tan Sri Mohd Sidek Bin Hj Hassan kepada Ketua Pengarah Alam Sekitar, Puan Halimah Bt Hassan.

Laman Intranet Jabatan Alam sekitar

Sejajar dengan hasrat Jabatan untuk mewujudkan satu pusat maklumat untuk warga JAS, Laman Intranet JAS telah diberi wajah baru dengan menampilkan rekabentuk yang lebih ringkas dan menarik serta padat dengan kandungan berinformasi dan kemudahan *online* yang diharapkan dapat memberi manfaat kepada warga JAS.

The Information Technology Division is responsible for planning, acquiring and implementing of information and communication technologies aimed at improving the department's organizational management efficiency and effectiveness resulting in better public service delivery system. This includes the acquisition of ICT equipment, services and infrastructure, development and implementation of application systems, as well as development of ICT training programmes.

Department of Environment's Website 5 Star Rating

The Department of Environment's Website was awarded a 5-star rating and ranked third under the Overall Top 10 Websites Category in the Malaysia Government Portals and Websites Assessment (MGPWA) 2011 organized by Multimedia Corporation Sdn Bhd (MDEC). The award ceremony was held at the Putrajaya International Convention Centre (PICC) on 1 December 2011 in conjunction with the MGPWA 2011 Seminar. The award was presented by the Chief Secretary to the Government, YBhg Tan Sri Mohd Sidek bin Hj Hassan to the Director General of Environment, Puan Halimah Hassan.

Department of Environment's Intranet Site

In line with the department's effort to establish an information centre for its staff, the DOE's Intranet Site was given a fresh facelift featuring a simpler yet attractive design and full of informative content and online services that are expected to benefit all DOE staff.

Penarafan 5 Bintang Laman Web Jabatan Alam Sekitar
Department of Environment's Website 5 Star Rating

Laman Intranet Jabatan Alam Sekitar
Department of Environment's Intranet Site

Sistem Kawalan Hakisan & Sedimen (*ESC Online*)

Sistem Aplikasi Kawalan Hakisan dan Sedimen (*ESC Online*) merupakan sistem pelaporan dalam talian bagi penghantaran Laporan Pemeriksaan Amalan Pengurusan Terbaik (BMPs) secara atas talian. Sasaran pengguna sistem ini terdiri daripada pemaju projek, kontraktor dan perunding yang terlibat dalam pemeriksaan BMPs. *ESC Online* digunakan untuk memantau aktiviti pengurusan kawalan hakisan dan sedimen dengan memastikan BMPs yang diamalkan oleh pemaju projek dilaksanakan dengan berkesan.

Peningkatan Sistem Aplikasi E-Kawalan Alam Sekitar (eKAS)

Sistem E-Kawalan Alam Sekitar (eKAS) merupakan satu sistem aplikasi bersepadu berasaskan web yang menjadi pusat pengumpulan data-data berkaitan alam sekitar, termasuk maklumat punca pencemaran, pelesenan, pematuhan dan penguatkuasaan alam sekitar. Pada September 2011, Bahagian Teknologi Maklumat telah melancarkan eKAS Versi 3.0 yang membawa nafas baru kepada sistem ini dengan menyediakan fungsi-fungsi yang jauh lebih baik berbanding eKAS Versi 2.0. Sistem versi baru ini turut menampilkan Modul Sejarah Penguatkuasaan Dan Pematuhan Dalam Talian (ECHO) yang membantu pengguna mendapatkan maklumat asas serta sejarah penguatkuasaan dan pematuhan bagi satu-satu premis industri dengan lebih mudah.

Peningkatan Sistem *E-Consignment Note*

Bahagian Teknologi Maklumat juga telah mengambil inisiatif untuk meningkatkan Sistem Aplikasi e-Consignment Note (eCN) daripada Versi 1.0 kepada Versi 2.0. Selain daripada berwajah baru, sistem ini telah ditambahbaik dengan pembangunan modul-modul baru seperti Penghantaran Notifikasi Buangan Terjadual Secara *Online* dan Penghantaran Laporan Inventori BuanganTerjadual Secara *Online*.

Erosion & Sediment Control System (ESC Online)

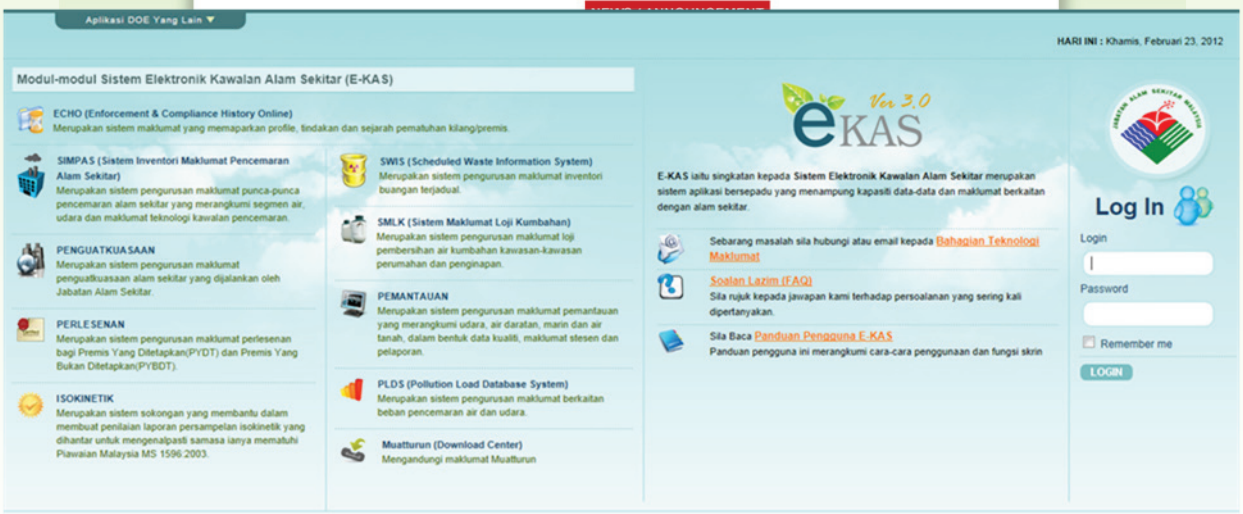
The Erosion and Sediment Control Application System (ESC Online) is an online reporting system for submission of Best Management Practices (BMPs) Inspection Report. The target users for this system are project developers, contractors and consultants involved in BMPs inspection. ESC Online is used to monitor the management activities of erosion and sediment control to ensure the BMPs practised by project developers are implemented effectively.

E-Kawalan Alam Sekitar (eKAS) System Upgrade

The E-Kawalan Alam Sekitar (eKAS) System is an integrated web-based application system that serves as a repository of environment related data, including pollution sources, licensing, compliance and enforcement activities. In September 2011 the Information Technology Division launched the Version 3.0 of eKAS which brings a new breath to the system with further improved features compared to eKAS Version 2.0. The new system also features the Enforcement & Compliance History Online Module (ECHO) which is a new module that facilitates user to easily retrieve an industrial premise's basic details as well as its enforcement and compliance history.

E-Consignment Note System Upgrade

The Information Technology Division has also taken the initiative to upgrade the E-Consignment Note System Version 1.0 to Version 2.0. Apart from being given a fresh facelift, the system is further improved with the development of two new modules which are the Scheduled Waste Online Notification and Scheduled Waste Inventory Online Submission.



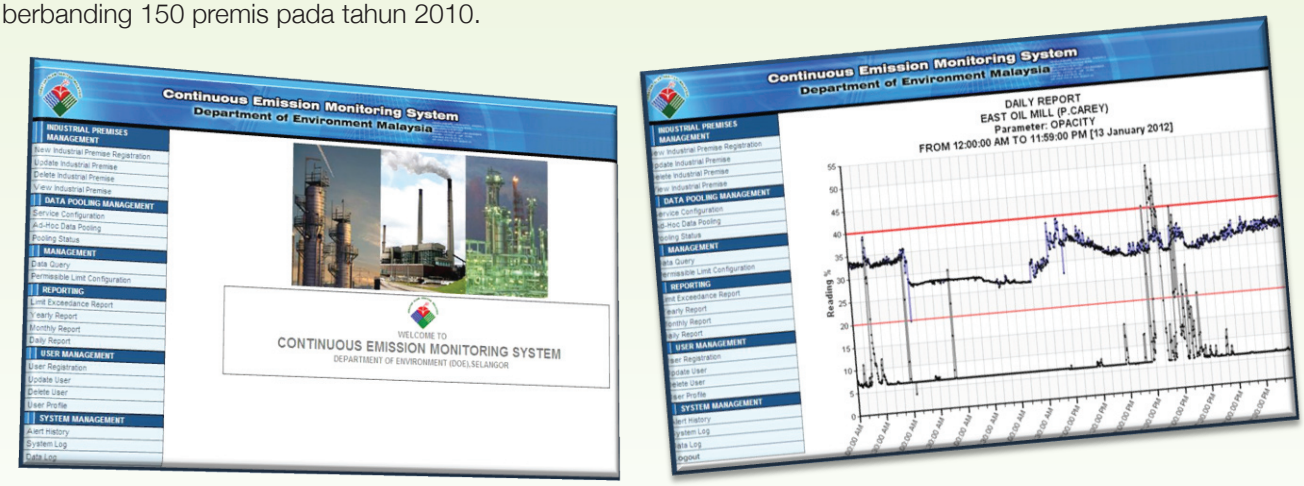
Dari atas: eCN v2.0, eKAS v3.0 & ESC Online
From top: eCN v2.0, eKAS v3.0 & ESC Online

Sistem Penguatkuasaan Dan Pemantauan Jarak Jauh Melalui *Continuous Emissions Monitoring System* (RMESvCEMS)

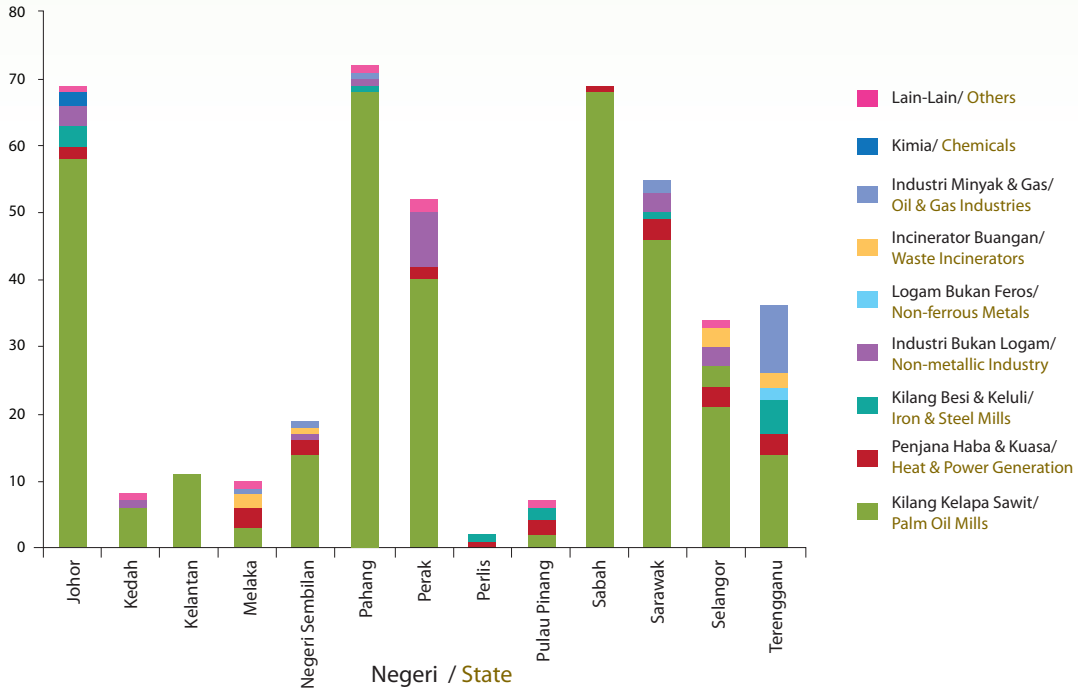
Sehingga penghujung tahun 2011 sejumlah 444 premis industri telah didaftarkan dalam Sistem Penguatkuasaan dan Pemantauan Jarak Jauh melalui *Continuous Emission Monitoring System* (CEMS). Ini menunjukkan peningkatan sebanyak 108 premis didaftarkan pada tahun tersebut berbanding 336 premis berdaftar pada tahun 2010. Sejumlah 217 premis telah berjaya menyalurkan data pelepasan bahan pencemar udara ke Sistem RMESvCEMS berbanding 150 premis pada tahun 2010.

Remote Monitoring And Enforcement System Via Continuous Emissions Monitoring System (RMESvCEMS)

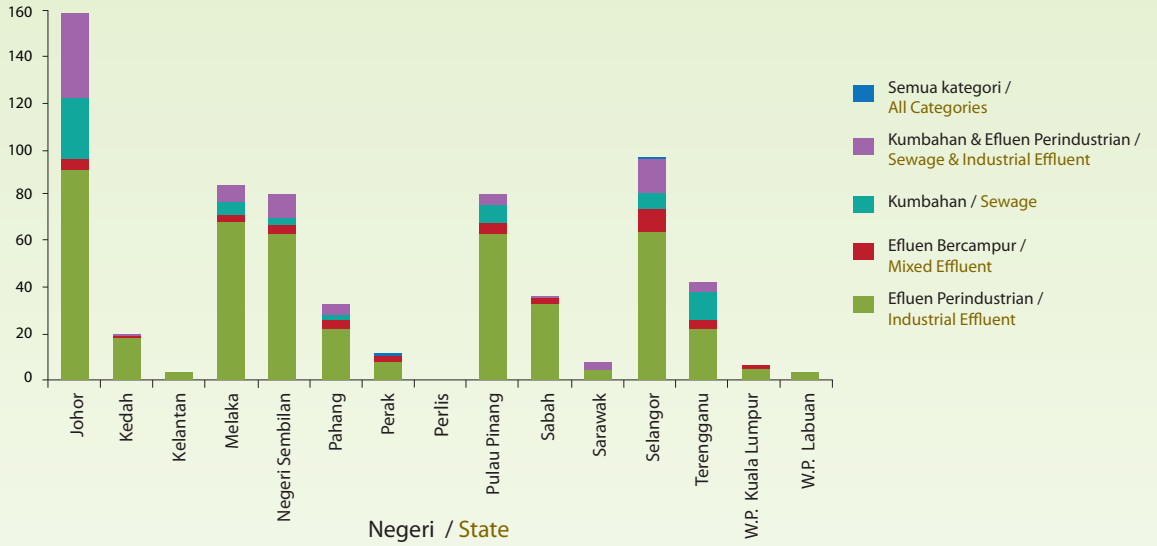
Towards the end of 2011, a total of 444 industrial premises were registered in the Remote Monitoring and Enforcement System via Continuous Emissions Monitoring System (RMESvCEMS). This shows an increase of 108 registered premises compared to 336 registered premises in 2010. A total of 217 premises have successfully sent their emissions data into the RMESvCEMS system compared to 150 premises in 2010.



Sistem Penguatkuasaan Dan Pemantauan Jarak Jauh Melalui Continuous Emissions Monitoring System (RMESvCEMS)
Remote Monitoring and Enforcement System via Continuous Emissions Monitoring System (RMESvCEMS)



Rajah 7.1 JAS: Bilangan Premis yang Berdaftar Dalam RMESvCEMS Mengikut Jenis Industri dan Negeri, 2011
Figure 7.1 DOE: Number of Premises Registered in the RMESvCEMS by Industry and State, 2011



Rajah 7.2 JAS: Bilangan Premis Industri yang Berdaftar Dalam MDMR Mengikut Jenis Pelepasan dan Negeri, 2011
Figure 7.2 DOE: Number of Industrial Premises Registered in the MDMR by Discharge Type and State, 2011

Sistem Pelaporan Bulanan Pelepasan Efluen Perindustrian dan Kumbahan (MDMR)

Pelaksanaan Sistem Pelaporan Bulanan Pelepasan Efluen Perindustrian dan Kumbahan (MDMR) telah dibuat sejak pertengahan tahun 2010. Sehingga Disember 2011, jumlah pengguna berdaftar bagi sistem ini adalah sebanyak 663 premis industri. Bilangan laporan yang telah dikemukakan melalui sistem ini adalah 1,269 laporan pelepasan kumbahan, 3,586 laporan pelepasan efluen perindustrian dan 162 laporan pelepasan efluen campuran.

Perolehan Dan Pelupusan Peralatan ICT

Pada tahun 2011, Bahagian Teknologi Maklumat telah membuat perolehan sejumlah 87 komputer desktop, 18 komputer riba dan 40 pencetak. Manakala sejumlah 163 komputer desktop, 17 komputer riba dan 75 pencetak telah dilupuskan pada tahun yang sama. **Jadual 7.1** menunjukkan pelupusan dibuat ke atas peralatan ICT yang telah usang dan rosak.

Program Latihan ICT

Pada tahun 2011, Bahagian Teknologi Maklumat dengan kerjasama Institut Latihan Alam Sekitar Malaysia (EiMAS) telah menganjurkan program latihan ICT, termasuklah kursus, bengkel dan taklimat ICT sebagai sebahagian daripada usaha untuk meningkatkan kefahaman, pengetahuan dan kemahiran ICT di kalangan warga JAS. (**Jadual 7.2**).

Monthly Industrial Effluent And Sewage Discharge Monitoring Report (MDMR)

The Monthly Industrial Effluent And Sewage Discharge Monitoring Report (MDMR) was implemented in mid 2010. By December 2011, the number of registered users of this system were 663 industrial premises. The number of reports submitted using the system are 1,269 reports for sewage discharge, 3,586 reports for industrial effluent discharge, and 162 reports for mixed effluent discharge.

Procurement And Disposal of ICT Equipment

In 2011, the Information Technology Division had acquired a total of 87 desktop computers, 18 laptop computers and 40 printers. Meanwhile a total of 163 desktop computers, 17 laptop computers and 75 printers were disposed in the same year. **Table 7.1** shows the list of acquired and disposed hardware.

ICT Training Programmes

In 2011, the Information Technology Division collaborated with the Environment Institute of Malaysia (EiMAS) in organizing its ICT training programs, including courses, workshops and talks in its effort to increase the understanding, knowledge and skills in ICT among DOE staff. (**Table 7. 2**).

Jadual 7.1 JAS: Senarai Perolehan & Pelupusan Perkakasan ICT, 2011
Table 7.1 DOE: List of Acquired & Disposed ICT Hardware, 2011

Bil. / No.	Pejabat JAS DOE Office	Komputer Desktop / Computer Desktop		Komputer Riba / Laptop Computer		Pencetak / Printer	
		Peroleh / Acquired	Lupus / Disposed	Peroleh / Acquired	Lupus / Disposed	Peroleh / Acquired	Lupus / Disposed
1.	W.P Putrajaya	37		2		4	
2.	Johor	6		2		3	
3.	Kedah	4	27	1	1	2	11
4.	Kelantan	2	14	1	1	2	4
5.	Melaka	2	15	1		2	11
6.	Negeri Sembilan	3		1		2	
7.	Pahang	4	13	1		3	3
8.	Perak	4	14	1	1	3	8
9.	Perlis	1	17	1	2	1	5
10.	Pulau Pinang	2	11	1		2	9
11.	Sabah	4		1		3	
12.	Sarawak	4	29	1	8	3	21
13.	Selangor	5		1		3	
14.	Terengganu	2		1		2	
15.	W.P Labuan	1		1		1	
16.	W.P Kuala Lumpur	3		1		2	
17.	EiMAS	3	23	0	4	2	3
	JUMLAH/ TOTAL	**87**	**163**	**18**	**17**	**40**	**75**

Jadual 7.2 JAS: Program Latihan ICT, Tahun 2011
Table 7.2 DOE: ICT Training Programmes, Year 2011

Bil. / No.	Kursus/ Course	Tarikh/ Date	Peserta/ Participants
1.	Latihan Pengguna : Sistem Pengurusan Fail / End User System Training : File Management System	10 - 11 Feb 2011	20
2.	Program Pemantapan ICT / ICT Enhancement Programme	21 - 25 Feb 2011	20
3.	MS Office Suite 2007 – Peringkat Pertengahan (Sesi 1) / MS Office Suite 2007 – Intermediate Level (Session 1)	14 - 18 Mar 2011	20
4.	Penyediaan Montaj Menggunakan Powerpoint & Photoshop / Montage Making Using Powerpoint & Photoshop	4 - 5 Apr 2011	20
5.	Pengenalan kepada PHP & MySQL / Introduction to PHP & MySQL	11 - 15 Apr 2011	20
6.	MS Office Suite 2007 – Peringkat Pertengahan (Sesi 2) / MS Office Suite 2007 – Intermediate Level (Session 2)	6 - 10 Jun 2011	20
7.	Latihan Pengguna Sistem Aplikasi EKAS Versi 3.0 / End User System Training : EKAS System Version 3.0	18 - 21 Jul 2011	20
8.	Penyelenggaraan Komputer (Sesi 1) / Computer Maintenance (Session 1)	12 - 13 Sep 2011	30
9.	Microsoft Office Suite 2007 – Peringkat Lanjutan / Microsoft Office Suite 2007 – Advanced Level	26 - 28 Sep 2011	20
10.	Penyelenggaraan Komputer (Sesi 2) / Computer Maintenance (Session 2)	3 - 4 Oct 2011	30
11.	Bengkel Sistem Pengurusan Stor / Store Management System Workshop	Oct & Dec 2011	20

BAB 8 / CHAPTER 8

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

Program Latihan EiMAS

Pada tahun 2011, EiMAS telah berjaya menyediakan latihan kepada sejumlah 2,748 peserta melalui 118 kursus (**Jadual 8.1**). Daripada 2,748 peserta yang menyertai program latihan yang telah dilaksanakan sejumlah 1,324 peserta (48.18%) adalah kakitangan JAS, manakala selebihnya adalah peserta dari luar jabatan seperti agensi kerajaan dan pihak swasta. Program latihan ini bertujuan untuk meningkatkan kecekapan dan kompetensi di kalangan semua peserta.

Program Latihan untuk Industri

Pada tahun 2011, EiMAS meneruskan usaha menganjurkan program-program latihan untuk industri, bagi meningkatkan kefahaman dan pengetahuan mereka dalam mencapai pematuhan terhadap kehendak alam sekitar.

Kursus Pensijilan untuk Industri

Pada tahun 2011, sebanyak 57 Kursus Persijilan untuk pihak industri telah berjaya dilaksanakan iaitu Kursus Pensijilan Untuk Pengurusan Buangan Terjadual, Kursus Pensijilan Bagi Operator Alat Kawalan Pencemaran Udara dan Kursus Pensijilan bagi Operator Sistem Pengolahan Efluen Industri. 57 peperiksaan kursus pensijilan tersebut juga telah dilaksanakan pada tahun 2011.

Program Pensijilan Pegawai JAS

Program pensijilan bagi pegawai - pegawai JAS buat pertama kalinya diadakan pada tahun 2011. Kursus ini telah direkabentuk untuk meningkatkan dan memantapkan kefahaman dan kemahiran pegawai-pegawai jabatan dalam melaksanakan pemeriksaan dan aktiviti penguatkuasaan yang seterusnya dapat mengiktiraf mereka sebagai pemeriksa yang kompeten. Kursus-kursus yang dilaksanakan oleh pusat-pusat teknikal EiMAS termasuklah *Certified Environmental Professional in IETS Inspection (CePIETSI), Certified Environmental Professional in Scrubber Inspection*

EiMAS Training Programme

In 2011, EiMAS had successfully executed 118 training courses for a total of 2,748 participants (**Table 8.1**). Out of the 2,748 participants, 1,324 participants (48.18%) were from DOE while the rest were participants from the government agencies and private sectors. These training programmes were aimed to enhance the efficiency and competency of the participants.

Training Programmes for Industries

In 2011, EiMAS continued to carry out training programmes for industries in order to upgrade their understanding and knowledge towards compliance to environmental requirements.

Certification Courses for Industries

In 2011, 57 Certification Course were conducted for the industries namely, Certification Course for Scheduled Waste Management, Certification Course for Operators of Air Pollution Control Equipment (Bag Filter Dust Collector) and Certification Course for Operators of Industrial Effluent Treatment Systems (IETS). Examination for these certification courses were conducted 57 times during year 2011.

Certification Program for DOE Officers

Certification program for DOE officers were held for the first time in 2011. Certification courses are designed to upgrade and enhance the understanding and skills of DOE officers in executing inspection and enforcement activities and subsequently certify them as competent DOE inspectors. The courses implemented by the technical centres in EiMAS include Certified Environmental Professional in IETS Inspection (CePIETSI), Certified Environmental Professional in Scrubber Inspection (CEPSI), Certified Environmental Professional in Bag Filter Inspection (CEPBFI) and

(CEPSI), Certified Environmental Professional in Bag Filter Inspection (CEPBFI) dan *Certified Environmental Professional in Scheduled Waste Inspection (CEPSWI).*

Penilaian kompetensi calon terdiri daripada beberapa elemen yang merangkumi pemahaman teori, tugasan individu dan berkumpulan, latihan praktikal di makmal pembelajaran dan latihan *hands-on*. Satu elemen tambahan yang dimasukkan ke dalam kursus persijilan EiMAS untuk mewujudkan perubahan tingkah laku pegawai JAS ialah penyediaan laporan latihan di lapangan. Ini akan membuktikan bahawa pengetahuan dan kemahiran yang diperolehi di dalam kelas latihan telah dipraktikkan dalam tugas di lapangan. Laporan ini boleh disediakan melalui pemeriksaan ke atas premis industri yang dipilih, menjalani program sangkutan di kilang atau mengendalikan sesi bimbingan industri dalam melaksanakan aktiviti pemantauan prestasi terhadap sistem pengolahan efluen perindustrian berdasarkan perundangan JAS. Program ini akan terus dilaksanakan dari tahun ke tahun.

Program Sangkutan

EiMAS telah menguruskan beberapa program sangkutan bagi kakitangan JAS di beberapa organisasi swasta di dalam negara dan di luar negara. Program ini bertujuan untuk menyediakan latihan *hands-on* kepada kakitangan JAS bagi memboleh-kan mereka menjadi jurulatih yang kompeten dalam bidang masing-masing. Seramai 34 orang pegawai telah mengikuti program sangkutan di premis kilang di dalam negara (**Jadual 8.2**) dan tujuh (7) orang pegawai mengikuti program sangkutan di luar negara pada tahun 2011 (**Jadual 8.3**).

Latihan Di Dalam dan Luar Negara

Selain daripada mengendalikan program latihan dalam jabatan, EiMAS juga bertanggungjawab menguruskan kehadiran pegawai dan kakitangan JAS untuk mengikuti kursus di dalam dan luar negara yang tempohnya kurang daripada tiga (3) bulan.

Sepanjang tahun 2011, EiMAS telah mengaturkan kehadiran 31 orang pegawai JAS bagi menghadiri kursus di dalam negara (**Jadual 8.4**) dan 31 pencalonan bagi menghadiri program latihan di luar negara (**Jadual 8.5**).

Certified Environmental Professional in Scheduled Waste Inspection (CEPSWI).

The assessment of competency of the candidates under this program includes several elements consisting of theoretical understanding, group and individual assignments, practical laboratory work and hands-on training. An additional element which is unique and included in the EiMAS certification courses is to have a behavioural change in the participants after the certification process. Participants are required to prepare a field training report to demonstrate that the knowledge and skills obtained in the training classes have actually been translated into practice. This can be done by conducting inspection at the selected industrial premises, undergoing an attachment program or facilitating the industries in carrying out performance monitoring on the pollution control system in accordance to DOE's requirement. This program will continue annually.

Attachment Programmes

Attachment programmes for DOE officers were held at various private organizations within and outside the country. The objectives of this programme were to provide the 'hands-on' training for DOE staff to enable them to become competent trainers in their respective fields. A total of 34 officers attended this attachment programmes at factory premises in Malaysia (**Table 8.2**) and seven (7) officers attended attachment programmes outside Malaysia (**Table 8.3**) in 2011.

Local and Overseas Training Courses

Besides conducting internal training programmes, EiMAS was also responsible in making arrangements for DOE officers and staff for local and overseas training of less than three (3) months.

Throughout 2011, EiMAS had facilitated the attendance of 31 officers to attend courses/seminar that were held locally (**Table 8.4**) and 31 nominations for programmes outside Malaysia (**Table 8.5**).

Kerjasama dengan Institut Latihan Kehakiman dan Perundangan

EiMAS meneruskan program kerjasama dengan ILKAP melalui tiga (3) kursus bertajuk Kursus Asas Pendakwaan dan Tatacara Mahkamah, Kursus Tatacara Memberi Keterangan Di Mahkamah dan Kursus Teknik Pemeriksaan Saksi dan Penghujahan. Seramai 60 orang pegawai JAS telah menghadiri kursus-kursus tersebut. Para peserta turut didedahkan kepada sesi latihan perbicaraan kes alam sekitar sebenar.

Kerjasama dengan Akademi Laut Malaysia (ALAM)

Bagi tahun 2011, Pusat Undang-Undang dan Penguatkuasaan EiMAS dengan kerjasama Akademi Laut Malaysia (ALAM) dan Bahagian Air dan Marin (JAS) telah membentuk Modul Latihan Penguat-kuasaan Marin. Antara kandungan utama modul ini selain dari meliputi prosedur penguatkuasaan ialah mengenali operasi dan bahagian kapal yang berpotensi menjadi punca pencemaran dan rekod-rekod yang boleh membantu di dalam tugas siasatan pencemaran marin dan tumpahan minyak khususnya. Kursus berkenaan turut melibatkan sesi *hands-on* di ALAM, Melaka.

Kerjasama dengan Universiti Kebangsaan Malaysia

Kursus Statistik Alam Sekitar – Analisis dan Interpretasi Data untuk pegawai-pegawai JAS telah diadakan dengan kerjasama pihak Universiti Kebangsaan Malaysia. Pada akhir kursus ini para peserta akan dapat menggunakan statistik di dalam analisis data dan seterusnya membantu mengenalpasti strategi baru dalam meningkatkan keberkesanan program sedia ada atau membentuk program-program baru untuk mengurus alam sekitar.

Collaboration with the Judicial and Legal Training Institute (ILKAP)

EiMAS continued its collaboration programmes with ILKAP by organising three (3) courses; Basic Course on Prosecution and Court Procedure, Course On Procedures of Giving Evidence in Court and Course on Techniques on Submission and Examination of Witness. A total of 60 DOE's Officers attended these courses. The participants were also required to participate in mock trials based on actual environmental court cases.

Collaboration with Malaysia Maritime Academy (ALAM)

In 2011, the Law and Enforcement Centre in EiMAS with the cooperation of the Malaysia Maritime Academy (ALAM) and DOE's Water and Marine Division had developed a training Module on Marine Enforcement. Besides the enforcement procedure as the main focus of the module, the other important area is to train the participants in the identification of parts and operations of the ship that can potentially cause pollution and the relevant records or documents that can assist in the investigation of marine pollution especially in the event of an oil spill. The course involved a hands-on session at ALAM, Melaka.

Collaboration with Universiti Kebangsaan Malaysia

The course on Environmental Statistics – Data Analysis and Interpretation for DOE Officers was conducted in collaboration with Universiti Kebangsaan Malaysia. At the end of the course, the participants would be able to use statistics in data analysis which would help them in identifying new strategies to enhance the effectiveness of existing programmes or formulate new programmes in environmental management.

Jadual 8.1 JAS: Program Latihan EiMAS, 2011
Table 8.1 DOE: EiMAS Training Programmes, 2011

Bil. / No.	Kategori Kursus / Course Category	Bil. Kursus Yang Disediakan / No. of Courses Conducted	Peserta JAS / DOE Participants	Peserta Luar / External Participants	Tempoh (Hari) / Duration (Days)
1.	Kursus Asas Teknikal / Basic Technical Course	1	51	0	90
2.	Kursus Induksi Khusus / Specific Induction Course	1	48	0	5
3.	Pengurusan Kualiti / Quality Management	5	100	0	16
4.	Pengurusan Kualiti Air / Water Quality Management	9	201	0	45
5.	Pengurusan Kualiti Udara / Air Quality Management	7	114	0	31
6.	Perundangan Alam Sekitar / Environmental Legislation	6	128		30
7.	Pengurusan Alam Sekitar Dan Kesan Kepada Alam Sekitar / Environmental Management and Impact Assessment	13	233	139	51
8.	Pengurusan Buangan Terjadual / Scheduled Waste Management	10	248	8	212
9.	Program Pensijilan Untuk Industri / Certification Programme for Industry	57	0	1277	285
10.	Teknologi Maklumat / Information Communication Technology	9	201	0	30

Jadual 8.2 JAS: Program Sangkutan Dalam Negara, 2011
Table 8.2 DOE: Attachment Programmes in Malaysia, 2011

Bil. / No.	Lokasi/ Place	Tarikh/ Date	Peserta/ Participants
1	Arachem (M) Sdn. Bhd., Damansara	25 - 29 Apr 2011	1. PK Masnona Abdul Aziz (DOE Perak) 2. PK Nor Azah Masrom (DOE Headquarters - Strategic Communications Division) 3. PK Hasnita Mansor (DOE Selangor) 4. PK Ya Mohammad Nazir Syah Ismail (DOE N. Sembilan) 5. PK Siti Noriah Abu Bakar (DOE Pahang) 6. PK Zulaikha Mokhtar (DOE Selangor) 7. PPK Mohd Rosnaidi Mohd Zabidi (DOE Melaka) 8. PPK Siti Nor Aisah Abdul Razak (DOE Pahang) 9. PPK Nor Azizah Zainudin (DOE Headquarters - Water and Marine Division)
2	Malaysian Airlines (MAS) Subang	3 - 6 May 2011	1. KPP Jamaludin Mahmud Abu Bakar (EiMAS) 2. PK Hapsah Mohamad (EiMAS) 3. PK Nor Fatiha Zainudin Rahim (DOE Headquarters - EIA) 4. PK Nabilah Fatin Abdul Rahim (DOE Headquarters - Strategic Communications Division) 5. PK Shazana Mohd Ibrahim (EiMAS) 6. PPK Mior Izzuddin Baharuddin (DOE Sarawak) 7. PPK Khairul Zaki Salim (DOE Sarawak)
3	Brass Aloy Sdn. Bhd-Course on Certified Environmental Professional in Bag Filter Inspection (CEPBFI), Puchong	27 Jun - 1 Jul 2011	1. KPP Wan Aminordin Wan Kamaruddin (EiMAS) 2. PK Farah Diyana Rusli (EiMAS) 3. PPKK Kalsom Ismail (EiMAS) 4. PPK Muhammad Hizam Bin Mohd Ibrahim (EiMAS)
4	Makmal Analisa, Bukit Goh, Kuantan	4 - 8 Jul 2011	1. PK Hapsah Mohamad (EiMAS) 2. PK Shazana Mohd Ibrahim (EiMAS) 3. PK Aini Oriza Ramli (DOE Pahang) 4. PPKK Musin Konsusun (DOE Sarawak) 5. PPK Noor Adilah Suib (DOE Sabah) 6. PPK Mohd Azwar Zakariya (DOE Johor)
5	Arachem (M) Sdn. Bhd., Damansara	19 - 23 Sep 2011	1. PK Goh See Ben (EiMAS) 2. PK Parimala a/p Ponniah (DOE Selangor) 3. PPK Mohd Syukri Abu Hasan (DOE P. Pinang) 4. PPK Zailawati Mukhtar (DOE Kelantan) 5. PPK Abdul Basir Kapoor Khan (DOE K. Lumpur) 6. PPK Ramzul Ikhlas Abdul Rahim (DOE Selangor) 7. JT Mohd Shahril Azri Bin Sillahhudin (DOE Selangor) 8. JT Norhayati Jakria (DOE K. Lumpur)

Jadual 8.3 JAS: Program Sangkutan Luar Negara, 2011
Table 8.3 DOE: Attachment Programmes Outside Malaysia, 2011

Bil./ No.	Program / Programme	Tempat / Place	Tarikh / Date	Peserta / Participants
1	Attachment Programme and Certificate of Competence in Environmental Noise Measurement	United Kingdom	9 - 18 May 2011	1. KPP Wan Aminordin Wan Kamaruddin (EiMAS) 2. PK Mirza Zainudin (HQ - Air Division)
2	Attachment Program – Scheduled Waste Management (Senior Official)	Lafarge Emirate Cement, United Arab Emirates and Lafarge Czech Republic, Czech Republic	18 - 22 Sep 2011	1. Director Datin Paduka Che Asmah Ibrahim (DOE Selangor) 2. KPP Khiruddin Mohamad Idris (HQ - Hazardous Waste Division)
3	Attachment Program – Scheduled Waste Management (Junior Official)	Lafarge Emirate Cement, United Arab Emirates	18 - 22 Sep 2011	1. PK Al-Razi Kamarudin (HQ - Scheduled Waste Division) 2. PK Norazlina Abd Halim (HQ - Hazardous Waste Division)
4	Attachment Program – Environmental Enforcement	California, USA	12 - 23 Sep 2011	KPP Hajah Dalilah Haji Dali (EiMAS)

Jadual 8.4 JAS: Latihan Di Dalam Negara, 2011
Table 8.4 DOE: Local Training Courses, 2011

Bil. / No	Perkara / Title	Penganjur / Organizer	Tempat / Place	Tarikh / Date	Peserta / Participants
1	Kursus TOE-Program Latihan Kesedaran Terhadap Pencegahan Fraud Dalam Sektor Awam	Institut Integriti Malaysia	Menara Integriti, Kuala Lumpur	24 - 25 Jan 2011	KPP Hajah Dalilah Dali (EiMAS)
2	Kursus Penataran Bahasa Melayu dan Penulisan Dokumen Rasmi Sektor Awam	Dewan Bahasa dan Pustaka	Menara Dewan Bahasa dan Pustaka	22 - 23 Feb 2011	1) KPP Raseli Mat Lazim (EiMAS) 2) PK Azlina Omar (DOE Headquarters – Strategic Communications Division)
3	Majlis Perdana Perkhidmatan Awam Ke 12 (MAPPA XII)	Jabatan Perkhidmatan Awam Malaysia	Putrajaya International Convention Centre (PICC)	22 Mac 2011	1) PPKK Rosnani Ahmad (EiMAS) 2) PPK Rina Arnida Ahmad (EiMAS)
4	Seminar Keselamatan dan Kesihatan Pekerjaan	Jabatan Keselamatan dan Kesihatan Pekerjaan	Hotel Concorde, Shah Alam	24 Mac 2011	PK Zuraini Kerya (DOE Selangor)
5	Course on Project Management-Essential Skills in Getting Value For Money in Government, Private And Public-Private Partnership Projects	Emerge Knowledge Connection Sdn. Bhd.	Hotel Seri Pacific, Kuala Lumpur	5 - 7 Apr 2011	KPP Norhayati Mohd Yusof (DOE Headquarters –Assessment Division)

Jadual 8.4 JAS: Latihan Di Dalam Negara, 2011 (sambungan)
Table 8.4 DOE: Local Training Courses, 2011 (continued)

Bil. / No.	Perkara/ Title	Penganjur/ Organizer	Tempat/ Place	Tarikh/ Date	Peserta/ Participants
6	Kursus Penulisan Dalam Urusan Rasmi	Jabatan Peguam Negara	Jabatan Peguam Negara, Putrajaya	11 - 12 Apr 2011	1) KPP Hajah Dalilah Dali (EiMAS) 2) KPP Wan Aminordin Wan Kamaruddin (EiMAS) 3) PK Zaimastura Ibrahim (EiMAS) 4) PPKK Rosnani Ahmad (EiMAS) 5) PPK Wan Khairuldin Wan Ismail (EiMAS)
7	IFLA International Newspaper Conference 2011	Perpustakaan Negara Malaysia	Perpustakaan Negara Malaysia, Kuala Lumpur	25 - 27 Apr 2011	PP Hillney Sedan (EiMAS)
8	Program Amalan Persekitaran Berkualiti Yang Efektif	Perbadanan Produktiviti Malaysia (MPC)	Perbadanan Produktiviti Malaysia (MPC), Petaling Jaya	26 - 27 Apr 2011	PPTK Kartini Abdullah (EiMAS)
9	Seminar Akta Pemuliharaan Hidupan Liar 2010	Jabatan Peguam Negara	Jabatan Peguam Negara, Putrajaya	27 Apr 2011	KPP Hajah Dalilah Haji Dali (EiMAS)
10	LAB Pembangunan Ekonomi Bumiputera	Jabatan Perdana Menteri	Pusat Dagangan Dunia Putra (PWTC)	21 Mac - 1 Apr 2011	KPP Wan Aminordin Wan Kamaruddin (EiMAS)
11	International Training Workshop on Climate Change Adaption & Disaster Risk Reduction	World Youth Foundation	Hotel Avillion Legacy Melaka	27 - 30 Apr 2011	PPKK Md Zulhaidi Abd Manaf (EiMAS)
12	Basic Train the Trainer	NIOSH	NIOSH, Bangi	23 - 26 May 2011	PK Mohd Faizal Ab Jalil (DOE Perlis)
13	Seminar Akta Suruhanjaya Integriti Agensi Penguatkuasaan 2009	ILKAP	ILKAP, Bangi	14 Jul 2011	1) Puan Rahani Hussin Pengarah/Director (EiMAS) 2) KPP Rusnani Abdullah (EiMAS)
14	Intan Executive Talk	INTAN	INTAN, Bukit Kiara	14 Jul 2011	PK Goh See Ben (EiMAS)
15	Kursus Pengenalan Kepada Aktiviti-Aktiviti Eksplorasi dan Pengeluaran Bagi Sektor Petroleum dan Gas	PETRONAS Carigali Sdn. Bhd.	Shangri-La Hotel, Putrajaya	19 - 20 Jul 2011	1) KPP Zulkifli Din (DOE Headquarters – Water and Marine Division) 2) KPP Norazma Zainuddin (DOE Headquarters – Water and Marine Division)

Jadual 8.4 JAS: Latihan Di Dalam Negara, 2011 (sambungan)
Table 8.4 DOE: Local Training Courses, 2011 (continued)

Bil. / No	Perkara / Title	Penganjur / Organizer	Tempat / Place	Tarikh / Date	Peserta / Participants
16	Investigative Interviewing Techniques	JFPS Group (M) Sdn. Bhd.	Novotel Hotel, Kuala Lumpur	28 - 29 Jul 2011	1) KPP Dalilah Hj. Dali (EiMAS) 2) KPP John Rampai (EiMAS) 3) PPKK Hj. Kamarudin (EiMAS)
17	Forum Penyiasatan oleh Pihak Berkuasa/ Agensi Penguatkuasaan – Kekangan Masa dan Cabaran Penyiasatan	ILKAP	ILKAP, Bangi	19 Sep 2011	KPP Rosli Mustafa (DOE Negeri Sembilan)
18	Seminar Perundangan - Melindungi Hak-Hak Wanita	Puspanita JPS	Kompleks JPS, Kuala Lumpur	22 Sep 2011	KPP Raseli Mat Lazim (EiMAS)
19	Latihan Exchange Database	Kementerian Luar Negeri	Kementerian Luar Negeri, Putrajaya	28 Sep 2011	PPKK Rosnani Ahmad (EiMAS)
20	Seminar on Strategic Environmental Assessment (SEA) using RIAM	Envirolink Sdn. Bhd.	Beverly Hotel, Kota Kinabalu, Sabah	26 - 28 Sep 2011	1) KPP Ridzuan Abd Rashid (DOE Headquarters - Assessment Division) 2) KPP Norazizi Adinan (DOE Sabah)
21	Federation of ASEAN Pulp and Paper Industries Conference	Persatuan Pekilang Pulpa dan Kertas Malaysia	Hotel Marriot Putrajaya	20 Oct 2011	1) KPP Raseli Mat Lazim (EiMAS) 2) KPP Ahmad Saifful Salihin (EiMAS) 3) PKK Mai Zainatun Nufus Mohd Jaffar (DOE Selangor-Kajang Branch) 4) PKK Zuhainim Abdul Ghafar (DOE Selangor - Sepang Branch)
22	Course on Land, Property and Construction	Emerge Knowledge Connection Sdn Bhd	Putra World Trade Centre, Kuala Lumpur	1 - 3 Nov 2011	KPP Sharifah Zakiah Syed Sahab (DOE Headquaters - Assessment Division)

Jadual 8.5 JAS: Latihan Luar Negara, 2011
Table 8.5 DOE: Overseas Courses, 2011

Bil. / No.	Tajuk / Title	Penganjur / Organizer	Tempat / Place	Tarikh / Date	Peserta / Participants
1	Economic Partnership Program (EPP) – Promoting Awareness and Environmental Education Programmes on Climate Change	Jabatan Perkhidmatan Awam (JPA) and Japan International Cooperation Agency (JICA)	Japan	28 Feb - 13 Mac 2011	1. Director Choong Mei Chun (DOE Headquarters - Strategic Communications Division) 2. KPP Ramli Abd Rahman (DOE Headquarters - Cleaner Production Unit) 3. PKK Mohd Faizul Hilmi Bin Zulkifli (DOE Selangor) 4. PK Shafariza Shamsudin (DOE Headquarters - Strategic Communications Division) 5. PK Ling Ling Chui (DOE Headquarters - Strategic Communications Division) 6. PK Azlina Omar (DOE Headquarters - Strategic Communications Division) 7. PK Putri Shazlia Binti Rosman (DOE Headquarters - Strategic Communications Division) 8. PK Janizan Bin Abu Kassim (DOE Johor) 9. PK Ching Yuan Kong (DOE Sarawak)
2	The Regional Training Workshop on Repair, Refurbishment, Reconditioning of Used EEE and Recycling and Final Disposal of E-Waste	i) Basel Convention Regional Centre for South-East Asia (BCRC-SEA) ii) Ministry of Natural Resources and Environment of Thailand (PCD) iii) Ministry of Environment of Japan	Bangkok, Thailand	19 - 21 Apr 2011	1. KPP Fenny Wong Nyuk Yin (DOE Headquarters - Hazardous Waste Division) 2. PK Goh See Ben (EiMAS)
3	International Marine and Environmental Policy Education Program (Working Level Officials)	Korea Maritime Institute and Ministry of Land, Transport and Maritime Affairs	Republic of Korea	13 - 17 Jun 2011	1. KPP Zainal Abidin Abdullah (DOE Sarawak) 2. KPP Rosli Osman (DOE Sabah)

Jadual 8.5 JAS: Latihan Luar Negara, 2011 (sambungan)
Table 8.5 DOE: Overseas Courses, 2011 (continued)

Bil. / No.	Tajuk / Title	Penganjur / Organizer	Tempat / Place	Tarikh / Date	Peserta / Participants
4	International Marine and Environmental Policy Education Program (High Ranking Officials)	Korea Maritime Institute and Ministry of Land, Transport and Maritime Affairs	Republic of Korea	27 Jun - 1 Jul 2011	1. PK Mohamad Rahimi Dollah (DOE Headquarters - Water & Marine Division) 2. PK Julianah Dulaidi (DOE Headquarters - Water & Marine Division)
5	Course on Creation of Recycling Society based on Hazardous Waste Management and Appropriate Disposal in Asia	Japan International Cooperation Agency (JICA)	Japan	5 Jul - 6 Aug 2011	1. KPP Badlishah Ahmad (DOE Pulau Pinang) 2. PK Mohd Rosli Mohd Nor (DOE Headquarters - Hazardous Waste Division) 3. PK Shamsuri Abd Manan (DOE Headquarters - Water & Marine Division)
6	Regional Workshop on E-waste Collection Partnership	Basel Convention Regional Centre-South East Asia Region (BCRC-SEA)	Suzhou, China	29 - 30 Aug 2011	1. KPP Fenny Wong Nyuk Yin (DOE Headquarters - Hazardous Waste Division) 2. PK Goh See Ben (EiMAS)
7	Sustainable Development and Environmental Management	Singapore Cooperation Programme Training Award (SCPTA)	Singapore	5 - 16 Sep 2011	1. KPP Norazizi Adinan (DOE Sabah) 2. PK Ahmad Bukhori Najmi (DOE Penang)
8	Workshop for Enhancement of the Governmental Capacity on Water Environment in ASEAN Countries	Japan International Cooperation Agency (JICA)	Japan	21 Aug - 3 Sep 2011	1. PK Cressida Karen Chung (DOE Sabah) 2. PK Saravanan a/l Kassi (DOE N. Sembilan)
9	Enhancement of Training Capacity of EiMAS on Environmental Management	Jabatan perkhidmatan Awam dan Japan International Cooperation Agency (JICA)	Japan	20 Sep - 1 Oct 2011	1. KPP Shafe'ee Yasin (DOE Headquarters - Air Division) 2. KPP John Rampai (EiMAS) 3. PK Hapsah Mohammad (EiMAS) 4. PK Che Rohaida Ngah (EiMAS) 5. PK Azman Shah Ismail (DOE Penang) 6. PK Farah Diyana Rusli (EiMAS) 7. PK Amy Charlene Wong (EiMAS) 8. PPKK Nosora Mohd Jadi (DOE Melaka) 9. PPKK Md Zulhaidi Abd Manaf (EiMAS) 10. PPK Rina Arnida Ahmad (EiMAS)

Jadual 8.5 JAS: Latihan Luar Negara, 2011 (sambungan)
Table 8.5 DOE: Overseas Courses, 2011 (continued)

Bil. / No.	Tajuk / Title	Penganjur / Organizer	Tempat / Place	Tarikh / Date	Peserta / Participants
10	Jenesys East Asia Future Leadership Programme 2011/2012 on Environment & Community Revitalization Group	Japan Embassy	Japan	19 - 30 Nov 2011	PK Zaimastura Ibrahim (EiMAS)
11	JICA Young Leaders Programme on Urban Environmental Management	Japan International Cooperation Agency (JICA)	Japan	21 Nov - 8 Dec 2011	PK Nor Dalilah Abdul Rashid (DOE Headquarters - Assessment Division)

BAB 9 / CHAPTER 9

PENGELUARAN BERSIH DAN TEKNOLOGI MESRA ALAM
CLEANER PRODUCTION AND ENVIRONMENTALLY SOUND TECHNOLOGY

PEMBANGUNAN KEPAKARAN DAN MODUL LATIHAN ALAM SEKITAR

Di bawah Rancangan Malaysia Kesepuluh (2011-2015), Jabatan Alam Sekitar menerusi Unit Teknologi Bersih memberi penekanan terhadap pembangunan kapasiti Pengeluaran Bersih dengan membangunkan kepakaran sumber manusia untuk mempromosi dan meningkatkan keupayaan IKS dalam pengawalan dan pencegahan pencemaran.

Objektif Program Pembangunan Kapasiti Pengeluaran Bersih adalah seperti berikut:-

(i) Untuk membangunkan dan melaksanakan program latihan Pengeluaran Bersih berasaskan modul kepada Pegawai Jabatan Alam Sekitar dan industri khususnya kepada Industri Kecil dan Sederhana (IKS);

(ii) Untuk membangunkan dan melaksanakan program latihan *Cleaner Production Virtual Centre (CPVC) / Cleaner Production Implementation Tools* (CPIT) kepada Pegawai Jabatan Alam Sekitar dan industri khususnya kepada Industri Kecil dan Sederhana (IKS);

(iii) Untuk mengadakan program latihan sangkutan mengenai Pengeluaran Bersih kepada Pegawai Jabatan Alam Sekitar sama ada di dalam atau luar negara terpilih;

(iv) Untuk membangunkan modul latihan Pengeluaran Bersih mengikut jenis industri; dan

(v) Untuk mewujudkan jaringan Pengeluaran Bersih.

Latihan Pengeluaran Bersih Berasaskan Modul Kepada Pegawai JAS

Latihan Pengeluaran Bersih berasaskan modul dilaksanakan menggunakan modul latihan 'Audit Pengeluaran Bersih' dan 'Pengenalan kepada Pengeluaran Bersih' yang telah dibangunkan di bawah

DEVELOPMENT OF EXPERTISE AND ENVIRONMENTAL TRAINING MODULE

Under the Tenth Malaysia Plan (2011 - 2015), the Cleaner Production Unit emphasizes on capacity building of human resource in Cleaner Production to promote and increase the Small and Medium Industries (SMIs) ability in prevention and control of pollution.

The objectives of the Cleaner Production Capacity Building Programme are as follows:-

(i) To develop and implement Cleaner Production Training Module programme to DOE officers and industry mainly Small and Medium Industries (SMIs);

(ii) To develop and implement training programme on *Cleaner Production Virtual Centre* (CPVC) / *Cleaner Production Implementation Tools* (CPIT) to DOE officers and industry mainly Small and Medium Industries (SMIs);

(iii) To conduct local and overseas attachment training programmes on Cleaner Production to DOE officers;

(iv) To develop Cleaner Production training module according to the type of industry; and

(v) To create Cleaner Production networking

Cleaner Production Training Module Programme to DOE Officers

The Cleaner Production Training Module was implemented based on the training modules 'Cleaner Production Audit' and 'Introduction to Cleaner Production' that were developed under the Ninth

Rancangan Malaysia Kesembilan (RMKe-9). Modul mengandungi topik spesifik berdasarkan kepelbagaian dan jenis industri di negara ini.

Aktiviti-aktiviti yang dilaksanakan di bawah program ini pada tahun 2011 adalah seperti di **Jadual 9.1**.

Program Kompetensi Pengeluaran Bersih Untuk Pegawai JAS

Program ini merupakan program lanjutan daripada Latihan Audit Pengeluaran Bersih kepada Pegawai JAS. Program kompetensi ini bertujuan melatih pegawai-pegawai JAS supaya kompeten dalam bidang Pengeluaran Bersih dan seterusnya menjadi tenaga pakar yang akan membangunkan program-program CP serta terlibat dalam khidmat nasihat dan audit CP kepada industri.

Ia mengandungi 3 peringkat utama iaitu kursus Pengenalan CP, Kursus Audit CP atau kompetensi Tahap 1 dan program kompetensi Tahap 2 & 3. Pegawai yang lulus sekurang-kurangnya kompetensi Tahap 2 adalah berkemampuan untuk menjalankan audit CP di premis industri dan memberi khidmat nasihat mengenai opsyen-opsyen CP yang boleh dilaksanakan.

Sehingga tahun 2011, seramai 66 orang pegawai telah dilatih dan kompeten Tahap 1. Seramai 22 orang pegawai juga telah lulus kompetensi Tahap 2.

Program Latihan Pengeluaran Bersih kepada Industri

Latihan *Cleaner Production Virtual Centre* (CPVC) / *Cleaner Production Implementation Tools* (CPIT) dilaksanakan berdasarkan pembangunan 'Sistem Aplikasi untuk Penilaian dan Pelaksanaan Cleaner Production' di mana output utama daripada sistem tersebut adalah *Cleaner Production Implementation Tools* (CPIT) yang merupakan sistem aplikasi pelaksanaan opsyen Pengeluaran Bersih kepada Industri Kecil dan Sederhana (IKS).

Melalui sistem aplikasi ini, ia dapat membantu pihak IKS untuk mengurang dan meminimakan pencemaran alam sekitar dari peringkat awal aktiviti/ proses dengan mengamalkan pengeluaran bersih di industri masing-masing.

Malaysian Plan (RMKe-9). The modules contain specific topic relating to diversity and types of industry in this country.

The activities conducted under this programme in 2011 are shown in **Table 9.1**.

Cleaner Production Competency Programme For DOE Officers

This programme is the advanced programme of Cleaner Production Audit Training to DOE officers. The competency programme aims to train the officers to be competent and expert in the field of Cleaner Production, to develop the CP programmes as well as carrying out CP consultation and audit to the industries.

It consists of 3 main levels which include the CP Introduction Course, CP Audit Course or Competency Level-1 and Competency Level-2 & 3. An officer who passed the Competency Level-2 is capable to carry out a CP audit on industrial premises and provide consultation on CP options that can be implemented.

Until 2011, 66 officers were trained and passed the Competency Level-1, while 22 officers passed the Competency Level-2.

Cleaner Production Training Programme to Industries

The training on *Cleaner Production Virtual Centre* (CPVC) / *Cleaner Production Implementation Tools* (CPIT) was conducted based on the development of 'Cleaner Production Implementation and Assessment Application System' where the main output from the system is Cleaner Production Implementation Tools (CPIT) that serves as the Cleaner Production options implementation database system to the Small and Medium Industries (SMIs).

Through this application system, it will help the SMIs to reduce and minimize environmental pollution from the early stages of activities/ processes by implementing Cleaner Production practices in their respective premises.

Latihan Sangkutan dan Hubungan Jaringan Kerja Pengeluaran Bersih

Pada 20 – 24 Oktober 2011, pegawai Unit Teknologi Bersih, En. Ramli Abd Rahman telah menghadiri satu persidangan ASEAN – China Environmental Cooperation Forum 2011, "Innovation For Green Development" di Nanning, China. Turut hadir ke persidangan ini ialah Dr. Gary William Theseira dari Kementerian Sumber Asli & Alam Sekitar yang bertindak sebagai ketua delegasi, Dr. Leong Yow Peng (Universiti Tenaga Nasional) dan En. Mazhar Muhammad dari MM Vitaoils Sdn Bhd sebagai wakil pihak industri.

Persidangan yang dianjurkan oleh Kementerian Perlindungan Alam Sekitar China dan Kerajaan Wilayah Autonomi Guangxi Zhuang ini bertujuan untuk menyediakan satu forum peringkat tinggi untuk dialog polisi dan memberi peluang kepada pembuat – pembuat polisi, ketua-ketua perniagaan, pakar-pakar dan lain-lain *stakeholder* bagi mencari jalan untuk memupuk dan meningkatkan kerjasama alam sekitar di rantau ini.

Semasa persidangan yang dihadiri oleh semua wakil negara ASEAN dan China ini, En. Ramli Abd Rahman telah menyampaikan taklimat mengenai usaha-usaha yang telah dan sedang dilakukan oleh JAS dalam mempromosi dan meningkatkan amalan hijau dan konsep pengeluaran bersih di Malaysia terutama bagi Industri Kecil dan Sederhana.

Cleaner Production Networking and Attachment Programmes

On 20 – 24 October 2011, Mr. Ramli Abd Rahman from Cleaner Production Unit attended an ASEAN – China Environmental Cooperation Forum 2011, "Innovation for Green Development" in Nanning, China. Also present at this conference were Dr. Gary William Theseira from the Ministry of Natural Resources and Environment who was the head of delegation, Dr. Leong Yow Peng (University Tenaga Nasional) and Mr. Mazhar Muhammad from MM Vitaoils Sdn. Bhd, representing the industry sector.

The conference organized by the Ministry of Environmental Protection of China and People's Government of Guangxi Zhuang Autonomous Region of China was aimed to provide a high level forum for policy dialogue and to give opportunity for policy makers, business leaders, experts and other stakeholders to explore the ways to promote and enhance environmental cooperation in the region.

During the conference which were attended by all representatives from ASEAN countries and China, Mr Ramli Abd Rahman gave a talk on the past and ongoing efforts that were implemented by DOE to promote and enhance environmental friendly and Cleaner Production practices in Malaysia especially for Small and Medium Industries.

PROGRAM MENINGKATKAN KEUPAYAAN INDUSTRI KECIL DAN SEDERHANA (IKS) DALAM PENGAWALAN DAN PENCEGAHAN PENCEMARAN

Di bawah Rancangan Malaysia Kesepuluh (RMK10) (2011-2015), Jabatan Alam Sekitar telah berjaya melaksanakan program dan projek seperti yang telah dirancang bagi meningkatkan pelaksanaan pengeluaran bersih oleh pihak IKS. Objektif program meningkatkan keupayaan IKS dalam pengawalan dan pencegahan pencemaran adalah untuk:

i. Melaksanakan bantuan Audit Pengeluaran Bersih kepada IKS;

ii. Melaksanakan bantuan khidmat nasihat kepada IKS;

iii. Melaksanakan skim pendaftaran juruaudit Pengeluaran Bersih;

iv. Menubuhkan badan panel verifikasi Pengeluaran Bersih oleh IKS;

v. Melaksanakan program penyelidikan dan pembangunan (R&D) mengenai Teknologi Mesra Alam dan Pengeluaran Bersih; dan

vi. Melaksanakan program perkongsian dan penyebaran maklumat Pengeluaran Bersih.

Antara program dan projek yang telah dilaksanakan adalah seperti berikut:-

Bantuan Audit Pengeluaran Bersih kepada Industri kecil dan Sederhana

JAS telah mempergiatkan usaha bagi menggalakkan pihak industri untuk melaksanakan amalan pengeluaran bersih menerusi program Bantuan Audit Pengeluaran Bersih dan Khidmat Nasihat.

Program Bantuan Audit Pengeluaran Bersih telah dilaksanakan dengan kerjasama pihak perunding SIRIM. Sebanyak 54 buah premis IKS telah terpilih untuk melalui proses pra-audit. Laporan pra-audit yang telah disediakan akan memberi maklumbalas kepada pihak IKS tentang opsyen Pengeluaran

CAPABILITY ENHANCEMENT FOR SMALL MEDIUM ENTERPRISE IN PREVENTION AND CONTROL OF POLLUTION

Under the Tenth Malaysia Plan (2011-2015), DOE had successfully carried out the projects and programmes that were planned to increase the implementation of Cleaner Production by SMIs. The objectives of the capability enhancement programme for SMIs in prevention and control of pollution are as follows:

i. Implementing Cleaner Production Audit assistance to SMIs;

ii. Providing consultation to SMIs;

iii. Implementing Cleaner Production auditor registration scheme;

iv. Establishing of Cleaner Production verification panel by SMIs;

v. Implementing research and development programme on Cleaner Production and Environmentally Sound Technology; and

vi. Implementing a programme on the sharing and dissemination of information on Cleaner Production.

Among the projects and programme conducted were:-

Cleaner Production Audit Assistance To Small and Medium Industries

DOE has intensified the effort to encourage the industries to adopt Cleaner Production practices through Cleaner Production Audit Assistance and Consultation programme.

The Cleaner Production Audit Assistance Programme was implemented with the cooperation of SIRIM as the project consultant. A total of 54 SMIs premises have been selected to undergo pre-audit process. The pre-audit report that was prepared would give information to the SMIs on the Cleaner Production

Bersih yang boleh diaplikasikan. Khidmat nasihat dan perbincangan susulan juga diberi supaya pihak IKS berjaya melaksanakan opsyen Pengeluaran Bersih.

Program ini juga merupakan satu platform latihan untuk pegawai JAS yang terlibat bagi meningkatkan kepakaran dan seterusnya akan melahirkan Pakar Bidang Khusus dalam Pengeluaran Bersih.

options that could be adopted. Follow up discussions and consultations were given to ensure the SMIs successfully implemented the Cleaner Production Option.

The programmes also serve as the training platform for DOE officers to develop expertise and henceforth will create Subject Matter Expert in Cleaner Production.

Program Penyelidikan dan Pembangunan (R&D) Teknologi Mesra Alam dan Pengeluaran Bersih

Research and Development Programme on Cleaner Production and Environmentally Sound Technology

Projek Demonstrasi Pengeluaran Bersih

Cleaner Production Demonstration Project

Pada tahun 2011, projek demonstrasi CP diteruskan dengan Projek Integrasi CP di Premis Pembuatan Batik. Premis Dagang Batikraf Sdn. Bhd. di Kota Bharu telah dipilih untuk dijadikan premis demo. Projek ini mendapat sokongan dari beberapa agensi seperti Lembaga Kraftangan Malaysia, UPEN Kelantan, JPS Kelantan dan juga JAS Negeri Kelantan. Projek bertujuan menyediakan sebuah premis batik yang bersifat mesra alam dan berdaya saing melalui pengaplikasian CP secara menyeluruh.

In 2011, the CP demonstration project was continued with CP Integration Project in the manufacturing industry. Dagang Batikraf Sdn. Bhd. in Kota Bharu was selected to be the demonstration premise. This project was supported by Lembaga Kraftangan Malaysia, UPEN Kelantan, DID Kelantan and DOE Kelantan State Office. The project aimed to showcase a batik premise that is environmental friendly and competitive using Cleaner Production practices.

Program Perkongsian dan Penyebaran Maklumat Pengeluaran Bersih

Information Dissemination and Sharing Programme on Cleaner Production

Pusat Maya Pengeluaran Bersih (PMPB)

Cleaner Production Virtual Centre (CPVC)

Pusat Maya Pengeluaran Bersih (PMPB) dibangunkan pada tahun 2007 untuk memaklum dan memberikan maklumat kepada Industri Kecil dan Sederhana mengenai opsyen-opsyen yang ada untuk aktiviti mereka. Pada tahun 2011, lebih banyak maklumat telah dimuatnaik dan latihan berkaitan PMPB telah dijalankan dalam sesi seminar kepada industri.

The Cleaner Production Virtual Centre (CPVC) was developed in 2007 to inform and educate the Small and Medium Industries in Malaysia about Cleaner Production options available for their activities. In 2011, more information about the CPVC has been uploaded and trainings were carried out during the seminars to the industry.

Buletin Pengeluaran Bersih

Cleaner Production Bulletin

Buletin Pengeluaran Bersih julung kalinya telah diterbitkan oleh Unit Teknologi Bersih, JAS pada bulan Oktober 2011. Buletin ini memaparkan informasi-informasi terkini dan maklumat mengenai Pengeluaran Bersih di Malaysia mahupun di luar Negara. Ia bertujuan untuk meningkatkan pemahaman berkaitan pengeluaran bersih kepada semua *stakeholder* di

The first publication of the Cleaner Production Bulletin was published in October 2011. The bulletin features latest information related to Cleaner Production in Malaysia as well as in other countries. It is aimed to promote and encourage industries especially the Small and Medium Industries (SMIs) to implement cleaner production practices. For promotional purposes,

negara ini terutamanya Industri Kecil dan Sederhana (IKS) untuk mewujudkan industri yang mesra alam. Bagi tujuan promosi juga beberapa bahan terbitan seperti brosur dan poster telah diterbitkan dan diedarkan kepada pihak industri.

Seminar Pengeluaran Bersih kepada Industri

Sebanyak dua (2) siri Seminar Pengeluaran Bersih telah berjaya dianjurkan oleh Unit Teknologi Bersih dengan kerjasama Unit Perundingan Universiti Malaya (UPUM). Tujuan seminar adalah untuk memberi pendedahan dan pengetahuan mengenai konsep Pengeluaran Bersih kepada industri. Seramai 150 orang peserta daripada wakil industri makanan, tekstil, automotif dan lain-lain telah menghadiri seminar tersebut. (**Jadual 9.2**).

Clean Batik Initiative

Program kerjasama *Clean Batik Initiatives* telah dilaksanakan oleh Unit Teknologi Bersih dan Malaysia-German Chamber of Commerce (MGCC) di Kelantan dan Terengganu. Sebanyak 100 buah premis batik telah dipilih untuk dijalankan audit CP dan melaksanakan opsyen-opsyen CP mengikut skop yang ditetapkan. Bantuan khidmat nasihat juga diberikan oleh perunding teknikal yang dilantik.

several publications such as brochures and posters were also published and distributed to the industries.

Seminar on Cleaner Production to Industries

Two (2) seminars were organized by Cleaner Production Unit with the cooperation of University of Malaya Consultancy Unit (UPUM). The purpose of the seminar is to give exposure and knowledge on Cleaner Production concept to industries. A total of 150 participants from food industry, textile, automotive and others attended the seminars. (**Table 9.2**).

Clean Batik Initiative

The Clean Batik Intiative collaboration programme was implemented by Cleaner Production Unit with Malaysia-German Chamber of Commerce (MGCC) in Kelantan and Terengganu. A total of 100 batik premises implemented with Cleaner Production options within the prescribed scope have been selected to be audited. Technical consultation was also provided by an appointed Consultant.

Bengkel *Cleaner Production Tips* Kepada Pegawai JAS
Training Workshop on Cleaner Production Tips to DOE Officers

Seminar Pengeluaran Bersih Kepada Industri, Zon Tengah
Seminar on Cleaner Production to Industries, Central Region

Jadual 9.1 JAS: Bengkel Latihan Pengeluaran Bersih kepada Pegawai JAS
Table 9.1 DOE: Training Workshop on Cleaner Production to DOE Officers

Bil. / No.	Tarikh / Date	Program / Programme	Tempat / Venue
1	21 – 25 Mac / March 2011	Bengkel Latihan 'Pengenalan kepada Pengeluaran Bersih' Training Workshop on 'Introduction to Cleaner Production'	Hotel Allson Klana, Nilai
2	20 – 24 Jun / June 2011	Bengkel Latihan 'Audit Pengeluaran Bersih' Training Workshop on 'Cleaner Production Audit'	Hotel Metro Prescott Inn, Kajang
3	Mac / March – September / September 2011	Latihan Kompetensi Pengeluaran Bersih Tahap 2 (Bil 1) kepada pegawai JAS Cleaner Production Level 2 Competency Training	Hotel Hyatt Saujana Kuala Lumpur, Subang, Selangor
4	27 – 28 Ogos / August 2011	Bengkel Audit Pengeluaran Bersih: Tip-tip/Opsyen-opsyen Pengeluaran Bersih Workshop on Cleaner Production Audit: Cleaner Production Options/Tips	JAS Melaka, JAS Pahang, JAS Perlis, JAS Sabah, JAS Kuala Lumpur DOE Malacca, DOE Pahang, DOE Sabah, DOE Kuala Lumpur

Jadual 9.2 JAS: Seminar/Bengkel Pengeluaran Bersih kepada Industri
Table 9.1 DOE: Seminar/Workshop on Cleaner Production to Industries

Bil. / No.	Tarikh / Date	Program / Programme	Tempat / Venue
1	12 Julai / July 2011	Seminar Pengeluaran Bersih kepada Industri bagi Zon Tengah Seminar on Cleaner Production to Industries : Central Region	IOI Palm Garden Resort, Putrajaya
2	20 September / September 2011	Seminar Pengeluaran Bersih kepada Industri bagi Zon Selatan Seminar on Cleaner Production to Industries : Southern Region	The Katerina Hotel, Batu Pahat

Pelaksanaan Opsyen Pengeluaran Bersih di Premis Pembuatan Mee
Implementation of Cleaner Production Option at Noodles Manufacturing Premise

Projek Demonstrasi CP – Projek Integrasi CP di Premis Pembuatan Batik
CP Demonstration Project – CP Integration Project in Batik Manufacturing

Galeri Gambar Pengeluaran Bersih
Cleaner Production Photo Gallery