

<Appendices>

Appendix 1

Enhancement and Conservation of National Environmental Quality Act, B.E. 2535, A.D. 1992

Enhancement and Conservation of National Environmental Quality Act B.E. 2535, A.D.1992

BHUMIBOL ADULYADEJ, REX. Given on the 29th Day of March B.E. 2535, Being the 47th Year of the Present Reign

His Majesty King Bhumibol Adulyadej is graciously pleased to proclaim that :

Whereas it is deemed expedient to reform and improve the law on enhancement and conservation of national environmental quality. Be it, therefore, enacted by the King, by and with the advice and consent of the National Legislative Assembly, acting as the National Assembly, as follows :

Section 1 This Act shall be called "The Enhancement and Conservation of National Environmental Quality Act, B.E. 2535"

Section 2 This Act shall come into effect after the elapse of a period of sixty days from the date following its publication in the Government Gazette.

Section 3 The following Acts shall be repealed :

(1) The Enhancement and Conservation of National Environmental Quality Act, B.E. 2518.

(2) The Enhancement and Conservation of National Environmental Quality Act (No. 2), B.E. 2521.

(3) The Enhancement and Conservation of National Environmental Quality Act (No. 3), B.E. 2522

Section 4 In this Act,

"Environment" means natural things which form the physical and biological conditions surrounding man and man-made things.

"Environmental Quality" means the balance of nature, being composed of animals, plants, natural resources and man-made objects which is for the benefit of subsistence of mankind and the sustenance of human-being and nature.

"Environmental Quality Standards" means the parameters of quality standards for water, air, noise and other conditions of the environment which are determined as the general criteria for enhancement and conservation of environmental quality.

"Fund" means the Environmental Fund.

"Pollutant" means wastes, hazardous substances and other polluting substances as well as residues, sediments or remainders of such matters, which are discharged from point sources of pollution or naturally occur in the environment, that have or are likely to have impacts on environmental quality or to cause conditions poisonous or harmful to the health and hygiene of the public, and shall mean to include radiation, heat, light, noise, odor, vibration or other nuisances emanated or discharged from point sources of pollution.

"Pollution" means the state or environment that has been affected, changed or contaminated by pollutants, resulting in deterioration of environmental quality, such as water pollution, air pollution, soil pollution.

"Point Source of Pollution" means any community, factory, building, structure, vehicle, place of business or activity or any other thing from which pollution is generated.

"Waste" means refuse, garbage, filth, dirt, wastewater, polluted air, polluting substances or any other hazardous substances which are discharged or originated from point sources of pollution, including residues, sediments or remainders of such matters, either in the state of solid, liquid or gas.

"Wastewater" means waste in liquid state including polluting or contaminating substances contained in such liquid.

"Polluted Air" means waste in gaseous state in the form of vapor, steam, exhaust, fume, odour, smoke, gas, dust, soot, ash or other polluting substances in the form of particulate matters that can be suspended in the atmospheric air.

"Hazardous Substance" means explosive substances, inflammable substances, oxidizing and peroxidizing substances, toxic substances, pathogenic substances, radioactive substances, genetic transforming substances, corrosive substances, irritating substances, or other substances whether chemical or not, which may cause danger to human-being, animal, plant, property or the environment.

"Nuisance" means nuisance according to the law on public health.

"Factory" means factories according to the law on industrial plants.

"Building" means buildings according to the law on building control.

"Vehicle" means automobiles or motorcycles according to the law on automobiles, vessels according to the law on Thai vessels and aircrafts according to the law on aviation.

"Monitoring Control Operator" means the person licensed to monitor, control, assess, operate and maintain wastewater treatment or waste disposal facility, or equipment, instrument, tools, appliances for control, treatment or disposal of any other pollution, which the owner or possessor of point source of pollution manages to construct and bring into operation by his own investment and expenses for the treatment of wastewaters or disposal of wastes or any other pollutants.

"Service Contractor" means the person licensed to render for hire the services of wastewater treatment or waste disposal or monitoring of environmental quality.

"Conservation Area" means the areas designated as national parks, wildlife reserves, tourism preserve and other protected areas pursuant to the governing laws related thereto.

"Local Official" means

- (1) President of the Municipal Council within a municipality.
- (2) President of the Sanitary District Board within a sanitary district.
- (3) Changwat Governor within a local administration organization.
- (4) Governor of the Bangkok Metropolitan Administration within Bangkok Metropolis.
- (5) Permanent Secretary of Pattaya City Administration within the City of Pattaya.
- (6) Head of local administrator in the administration of the local administration organization other than (1) to (5) above, established by specific law governing thereof, within such local administration organization.

"Pollution Control Official" means the person appointed by the Minister to perform the functions concerning pollution control under this Act.

"Competent Official" means the person appointed by the Minister to have power and duty to take action under this Act.

"Minister" means the Minister of Science, Technology and Environment.

Section 5 In case any provision under this Act refers to Changwat or mandates the power and duty of the Changwat Governor, such reference or mandate shall denote the inclusion of Bangkok Metropolitan Administration or the power and duty of the Governor of Bangkok Metropolitan Administration, as may be the case.

Section 6 For the purpose of public participation in the enhancement and conservation of national environmental quality, the following rights and duties may be accorded to individual person as provided by this Act or governing law related thereto:

- (1) To be informed and obtain information and data from the government service in matters concerning the enhancement and conservation of environmental quality, except the information or data that are officially classified as secret intelligence pertaining to national security, or secrets pertaining to the right to privacy, property rights, or the rights in trade or business of any person which are duly protected by law.
- (2) To be remedied or compensated by the State in case damage or injury is sustained as a consequence of dangers arisen from contamination by pollutants or spread of pollution, and such incident is caused by any activity or project initiated, supported or undertaken by government agency or state enterprise.
- (3) To petition or lodge complaint against the offender in case of being a witness to any act committed in violation or infringement of the laws relating to pollution control or conservation of natural resources.
- (4) To co-operate and assist government officials in the performance of duty relating to the enhancement and conservation of environmental quality.
- (5) To strictly observe the provisions of this Act or other laws concerning the enhancement and conservation of environmental quality.

Section 7 In order to encourage public participation in the promotion and conservation of environmental quality, non-governmental organizations (NGOs) having the status of a juristic person under Thai law or foreign law which are directly engaged in activities concerning environmental protection or conservation of natural resources without any objective to be involved in politics or to make profits from the engagement in such activities, shall be entitled to register with the Ministry of Science, Technology and Environment as the NGOs for environmental protection and conservation of natural resources in accordance with the rules, procedures and conditions prescribed by ministerial regulation.

Section 8 The NGOs that have been registered pursuant to section 7 may request for government assistance or support in the following matters :

- (1) The organization of volunteers to assist in the performance of duty of government officials under this Act or other laws concerning the enhancement and conservation of environmental quality.
- (2) Public relations campaign and dissemination of information or data to promote public awareness and

proper understanding and knowledge about environmental protection and conservation of nature and natural resources.

(3) Providing assistance to people in certain areas of the country to initiate projects or activities for environmental protection and conservation of natural resources in such areas.

(4) Conducting study and research in respect of environmental protection and conservation of natural resources and bringing to the attention of the Government or agencies concerned on what are the viewpoints and suggestions based upon the outcome of such study and research.

(5) Providing legal aid to people who are in jeopardy of or afflicted by pollution damage caused by leakage of pollutants or contamination as well as acting as representative of such pollution victims to bring lawsuit and litigate claim in court for compensation or damages to which they are entitled as legal remedies.

In case any registered NGOs, in the carrying out of activities indicated in the first paragraph, encounter problems or difficulties and request for help from the National Environment Board, the Prime Minister shall, with the recommendation of the National Environment board, have the power to direct for appropriate recourse or order the government agency or state enterprise concerned to render assistance or facilitation as seen fit under the circumstances.

The Fund Committee, with the approval of the National Environment Board, may consider to allocate grants or loans in support of any activity of the registered NGOs as deemed appropriate.

The registered NGOs may propose for nomination of candidates as representatives of the private sector to be appointed by the cabinet as qualified members of the National Environment Board.

In case any registered NGO's activities are undertaken by causing disturbances or contrary to public order or unsuitable, the Minister shall have the power to revoke the registration of the NGO involving in such activities.

Section 9

In case there is an emergency or public danger arising from natural disaster or pollution caused by contamination and spread of pollutants which will, if left without any remedial actions, seriously endanger the safety of life, body or health of the people, or aggravatedly cause damage to the properties of the people or the State, the Prime Minister shall have the power to order, as deemed appropriate, government agencies, state enterprises or any persons, including the persons who are or may be the victims of such danger or damage, to take prompt action, individually or jointly, in order to be able to control, extinguish or mitigate the adverse effects of such danger or damage. In case any polluters are known and can be identified, the Prime Minister shall be empowered to enjoin such persons from any acts which may aggravate the adverse effects of pollution during the occurrence of such endangering incident.

The Prime Minister may delegate the power to give orders pursuant to the first paragraph to the Changwat Governor to exercise such power and act on his behalf within the territorial jurisdiction of that Changwat. The said delegation of power shall be made by a written order and published in the Government Gazette.

When any order is given by the Prime Minister by virtue of the first paragraph, or by the Changwat Governor acting on behalf of the Prime Minister by virtue of the second paragraph, such order shall be published in the Government Gazette without delay.

Section 10

In order to prevent, remedy, extinguish or mitigate the emergency or danger of pollution envisaged by section 9, the Minister shall determine preventive measures and prepare a contingency plan to rectify the situation in advance.

Section 11

The Prime Minister and the Minister of Science, Technology and Environment shall have charge and control of the execution of this Act, insofar as it is concerned with their respective powers and duties conferred upon them under this Act.

The Minister of Science, Technology and Environment shall have the power to appoint pollution control officials and other competent officials, issue ministerial regulations prescribing fees not exceeding the rates attached hereto and prescribing other activities for the execution of this Act.

The Ministerial Regulations shall come into force upon their publication in the Government Gazette.

Chapter I National Environment Board

Section 12 There shall be a National Environment Board consisting of the Prime Minister as the Chairman, a Deputy Prime Minister designated by the Prime Minister as the first Vice Chairman, the Minister of Science, Technology and Environment as the second Vice Chairman, the Minister of Defense, the Minister of Finance, the Minister of Agriculture and Cooperatives, the Minister of Transport and Communications, the Minister of Interior, the Minister of Education, the Minister of Public Health, the Minister of Industry, the Secretary-General of the National Economic and Social Development Board, the Secretary-General of the Board of Investment, the Director of the Bureau of the Budget as members ex officio and members qualified in environmental matters not more than eight persons of which no less than half shall be representatives from the private sector and the Permanent Secretary of the Ministry of Science, Technology and Environment as member and secretary.

The appointment of qualified members shall be made by drawing from persons who are knowledgeable and known for their expertises, contributions and experiences in the matters concerning the enhancement and conservation of environmental quality.

Section 13 The National Environment Board shall have the power and duty as follows:

(1) To submit policy and plan for enhancement and conservation of national environmental quality to the cabinet for approval.

(2) To prescribe environmental quality standards pursuant to section 32.

(3) To consider and give approval to the Environmental Quality Management Plan proposed by the Minister according to section 35.

(4) To consider and give approval to the Changwat Action Plan for environmental quality management according to section 37.

(5) To make recommendations to the cabinet in respect of financial, fiscal, taxation and investment promotion measures for the implementation of the policy and plan for enhancement and conservation of national environmental quality.

(6) To propose for amendment or improvement of laws relating to the enhancement and conservation of environmental quality to the cabinet.

(7) To consider and give approval to the action plan for prevention and remedy of danger caused by contamination of pollutants or spread of pollution proposed by the Pollution Control Committee pursuant to section 53 (1).

(8) To consider and give approval to the setting of emission or effluent standards proposed by the Minister pursuant to section 55.

(9) To supervise, oversee and expedite the enactment of royal decrees and issuance of ministerial regulations, rules, local ordinances, notifications, bye-laws and orders which are necessary to ensure systematic operation of the laws relating to enhancement and conservation of environmental quality to the fullest extent possible.

(10) To submit opinion to the Prime Minister for his directions in case it appears that any government agency or state enterprise infringes or refrains from complying with the laws and regulations for environmental protection which may cause extensive damage to the environment.

(11) To specify measures for the strengthening and fostering of co-operation and co-ordination among government agencies, state enterprises and the private sector in matters concerning the promotion and conservation of environmental quality.

(12) To supervise the Fund management and administration.

(13) To submit reports on national environmental quality situation to the cabinet at least once a year.

(14) To perform other functions as may be provided by this Act or other laws to be within the authority of the National Environment Board.

Section 14 A qualified member appointed by the cabinet shall hold office for a term of three years and may be re-appointed for a period of not more than one consecutive term.

In case an additional appointment of qualified member is made during the term of those members who have already been appointed to hold office, the term of additional membership shall be equal to the remainder of the term of those members who have already been appointed before.

Section 15 In addition to the expiration of the term of office according to section 14, a qualified member appointed by the cabinet shall vacate office upon:

- (1) Death;
- (2) Resignation;
- (3) Being a bankrupt;
- (4) Being an incompetent or quasi-incompetent person;
- (5) Being punished by a final judgment to a term of imprisonment except for an offence committed through negligence or a petty offence.
- (6) Being dismissed by the cabinet for incompetence or misconduct or having vested interests in any activity or business that may have a direct impact on or adversely affect the environmental quality.

When a qualified member vacates office before the expiration of his term of office, the cabinet may appoint another person to fill the vacancy and such person shall hold office only for the remaining term of his predecessor.

Section 16 In convening the National Environment Board meeting, if the Chairman is absent or unable to perform the function, the first Vice Chairman shall act as the Chairman. If the Chairman and the first Vice Chairman are both absent or unable to perform the function, the second Vice Chairman shall act as the Chairman. If the Chairman and both the two Vice Chairmen are all absent or unable to perform the function, the members who attend the meeting shall elect one of the attending members to act as the chairman of the meeting.

Section 17 A meeting of the National Environment Board requires the presence of not less than one-half of the total member of its members to constitute a quorum.

The decision of a meeting shall be made by a majority of votes. In casting votes, each member shall have one vote. In case of an equality of votes, the Chairman of the meeting shall have an additional vote as a casting vote.

Section 18 The National Environment Board may appoint an expert committee or subcommittee to consider or carry out any matter as may be entrusted by the National Environment Board. Section 16 and section 17 shall apply mutatis mutandis to the meeting of the expert committee or subcommittee.

Section 19 The National Environment Board shall have the power to require government agencies, state enterprises and other persons to deliver documents relating to the examination of impacts on environmental quality and documents or data concerning the projects or workplans of such government agencies, state enterprises and persons for its consideration. For this purpose, the Board may, summon persons concerned to give explanation. If the Board is of the opinion that any project or workplan may seriously affect the environmental quality, it shall recommend remedial measures to the cabinet.

In case the documents or data required to be delivered to the National Environment Board pursuant to the first paragraph are relevant to trade secrets in the nature of a patent and protected by the law on patent rights, the National Environment Board shall specify suitable measures and methods for preventing such documents or data from being disclosed to anyone to ensure that they shall only be used strictly for the purpose of this section.

Section 20 In the performance of its function, the National Environment Board, the expert committee or the sub-committee may invite any person to present facts, explanation, opinion or technical advice as it deems fit and may request co-operation from any person with a view to ascertaining any fact or surveying any activity which may have an adverse effect on environmental quality.

Section 21 In the performance of its duties under this Act, the National Environment Board may entrust the Office of Environmental Policy and Planning, the Pollution Control Department or the Environmental Quality Promotion Department under the Ministry of Science, Technology and Environment with the operation or preparation of propositions to be made to the National Environment Board for further actions.

Chapter II Environmental Fund

Section 22 There shall be established a fund called the "Environmental Fund" in the Ministry of Finance with the following moneys and properties :

- (1) Money from the Fuel Oil Fund in the amount determined by the Prime Minister.
- (2) Money transferred from the Revolving Fund for Environmental Development and Quality of Life established by the Annual Budget for the Fiscal Year of B.E. 2535 Act, B.E. 2535.
- (3) Service fees and penalties collected by virtue of this Act.

- (4) Grants from the Government from time to time.
- (5) Moneys or properties donated by donors in the private sector both domestic and foreign, by foreign governments or by international organizations.
- (6) Interest and benefits accrued from this Fund.
- (7) Other moneys received for the operation of this Fund.

The Comptroller-General's Department, Ministry of Finance, shall keep the moneys and properties of the Environmental Fund and make disbursements from the fund in accordance with this Act.

Section 23 Fund disbursements shall be made for the following activities and purposes:

- (1) As grants to government agency or local administration for investment in and operation of the central wastewater treatment plant or central waste disposal facility, including the acquisition and procurement of land, materials, equipment, instrument, tools and appliances necessary for the operation and maintenance of such facility.
- (2) As loans to local administration or state enterprise for making available of air pollution control system, wastewater treatment or waste disposal facilities to be used specifically in the activities of such local administration or state enterprise.
- (3) As loans to private person in case such person has the legal duty to make available and install an on-site facility of his own for the treatment of polluted air, wastewater or waste disposal or any other equipment for the control, treatment or eliminate pollutants that are generated by his activity or business undertaking, or such person is licensed to undertake business as a Service Contractor to render services of wastewater treatment or waste disposal under this Act.
- (4) As aids or grants to support any activity concerning the promotion and conservation of environmental quality as the Fund Committee sees fit and with the approval of the National Environment Board.
- (5) As expenditures for administering the Fund.

Section 24 There shall be a Fund Committee consisting of the Permanent Secretary of the Ministry of Science, Technology and Environment as the Chairman, the Permanent Secretary of the Ministry of Agriculture and Cooperatives, the Secretary-General of the National Economic and Social Development Board, the Director of the Bureau of the Budget, the Director-General of the Department of Local Administration, the Comptroller-General of the Comptroller-General's Department, the Director-General of the Department of Public Works, the Director-General of the Department of Industrial Works, the Director-General of the Department of Mineral Resources, the Director-General of the Pollution Control Department, the Director-General of the Environmental Quality Promotion Department and not more than five qualified persons appointed by the National Environment Board as members and the Secretary-General of the Office of Environmental Policy and Planning as member and secretary.

Section 14 and section 15 shall apply mutatis mutandis to the holding office of the qualified members of the Fund Committee.

Section 25 The Fund Committee shall have the power and duty as follows

- (1) To consider on Fund allocation for use in the activities prescribed by section 23.
- (2) To prescribe rules, conditions, procedures and methods concerning application for allocation or loan from the Fund.
- (3) To lay down administrative rules and procedures concerning the power, duties and working methods of the Fund managers according to section 29 and section 30 as well as mechanisms for co-ordination among the Fund Committee, the Comptroller-General's Department and the Fund managers according to section 29 and section 30.
- (4) To lay down rules and procedures for the receipt and disbursement of moneys from the Fund.
- (5) To fix durations for repayment of loans from the Fund according to section 23 (2) or (3) as well as interest rates and securities as necessary and appropriate.
- (6) To determine the ratio and criteria for deduction of service fees and penalties that are required by section 93 to be remitted to the Fund.
- (7) To perform any other functions provided under this Act.

The prescription of rules according to sub-section (2), (3) or (4) and guidelines for action under sub-section (1) or (5) shall be approved by the National Environment Board.

The Fund Committee may appoint a subcommittee to consider or carry out any matter as may be entrusted by the Fund Committee.

Section 26 Section 16, section 17 and section 20 shall apply mutatis mutandis to the performance of

- functions of the Fund Committee and the subcommittee appointed by the Fund Committee.
- Section 27 In consideration to allocate money from the Fund for the purpose of section 23 (1), the Fund Committee shall give first priority to the request for allocation under the Changwat Action Plan for environmental quality management according to section 39 to construct or operate the wastewater treatment plant or waste disposal facility, for which certain amount of government budget has been earmarked or revenues of the local administration have been allocated as additional contributions to the Fund allocation.
The proportion between the government budget or contributions from the local revenues and the Fund allocation to be determined by the Fund Committee according to the first paragraph shall be determined in accordance with the rules laid down by the National Environment Board.
- Section 28 The Fund allocation as loans to the local administration, state enterprise or private person pursuant to section 23 (2) or (3) shall be determined by the Fund Committee in accordance with the rules and conditions stipulated by the National Environment Board.
In order to encourage compliance with this Act, the Fund Committee may, with the approval of the National Environment Board, allocate from the Fund as an exceptional long-term loan to any local administration, state enterprise, or private person and may determine to reduce the interest rates or make exemption to the payment of such interest as deemed appropriate.
- Section 29 The Comptroller-General of the Comptroller-General's Department, Ministry of Finance, shall be the Fund manager in relation to such portion of the Fund to be allocated as grants to the government agency or the local administration for investment in and operation of the central facility for wastewater treatment or waste disposal according to section 23 (1) and those portions of the Fund to be allocated for the purposes other than those provided by section 23 (2) and (3).
- Section 30 The Fund Committee may authorize an appropriate financial institution owned by the State or the Industrial Financing Corporation of Thailand to be the Fund manager in relation to such portion of the Fund that will be allocated as loans to the local administration, state enterprise or private person pursuant to section 23 (2) or (3).
In carrying out the management of Fund according to the First paragraph, the Fund manager has the duty to study and analyze the investment and technical feasibility of the project and shall be empowered to enter the loan agreement on behalf of the Fund Committee in the capacity as the lender, to keep and disburse moneys to the borrowers from this portion of the Fund in accordance with the terms and conditions of the loan agreement, to pursue, demand and receive repayments and interest from the borrowers in order to pay back to the Fund, and shall be empowered to lay down rules and procedures, with the approval of the Fund Committee, for such matters.
Under the loan agreement to be entered into according to the second paragraph, there must be a condition stipulated as an essential element of the agreement that the borrower shall have the duty to make use of the loan specifically for the purpose of meeting the requirements with which the borrower has the legal duty to comply under this Act or other related laws.
- Section 31 The moneys received into the Fund and kept by the Comptroller-General's Department, Ministry of Finance, shall be managed by deposit in saving or fixed accounts with State owned financial institutions in order to earn accrued interest.
All moneys earned by the Fund according to section 22 shall be paid into its account for the purpose of uses in the activities indicated in section 23 and shall not be remitted to the Treasury as revenues of the Government.

Chapter III Environmental Protection

Part 1 Environmental Quality Standards

- Section 32 For the purpose of environmental quality enhancement and conservation, the National Environment Board shall have the power to prescribe by notifications published in the Government Gazette the following environmental quality standards:
- (1) Water quality standards for river, canal, swamp, marsh, lake, reservoir and other public inland water sources according to their use classifications in each river basin or water catchment.

- (2) Water quality standards for coastal and estuarine water areas.
- (3) Groundwater quality standards.
- (4) Atmospheric ambient air standards.
- (5) Ambient standards for noise and vibration.
- (6) Environmental quality standards for other matters.

The prescription of environmental quality standards pursuant to the foregoing paragraph shall be based upon scientific knowledge, principles, criteria and evidence related thereto and shall also take into account the practicability of such standards from the viewpoint of economic, social and technological considerations.

Section 33 The National Environment Board shall, if deemed reasonable, have the power to prescribe special standards, which are higher than the environmental quality standards prescribed pursuant to section 31, for the protection of areas designated as conservation or environmentally protected area according to section 42, or areas designated according to section 44, or pollution control areas designated pursuant to section 58.

Section 34 The National Environment Board shall have the power to make appropriate modifications and improvements to the prescribed environmental quality standards in the light of scientific and technological progresses and changes in economic and social conditions of the country.

Part 2 Environmental Quality Management Planning

Section 35 The Minister shall, with the approval of the National Environment Board, formulate an action plan called "Environmental Quality Management Plan" for implementation of the national policy and plan for enhancement and conservation of environmental quality determined by virtue of section 13 (1).

The Environmental Quality Management Plan pursuant to the first paragraph shall be published in the Government Gazette.

It shall be the duty of all government agencies concerned to take actions within their powers and functions that are necessary for effective implementation of the Environmental Quality Management Plan and in order to ensure that actions are taken to achieve the objectives and goals as prescribed, it shall be the duty of the Ministry of Science, Technology and Environment to give advice to government agencies and state enterprises which are concerned with the formulation of workplans or the taking of any actions with a view to implementing the Environmental Quality Management Plan.

Section 36 The Environmental Quality Management Plan pursuant to section 35 may be a short, intermediate or long-term plan, as appropriate, and should contain workplans and guidances for action in the following matters:

- (1) Management of air, water and environmental quality in any other area of concerns.
- (2) Pollution control from point sources.
- (3) Conservation of natural environment, natural resources or cultural environment pertaining to aesthetic values.
- (4) Estimation of financing to be appropriated from government budget and allocated from the Fund which is necessary for implementation of the Plan.
- (5) Scheme for institutional arrangements and administrative orders by which co-operation and co-ordination among government agencies concerned and between the public service and private sector could be further promoted and strengthened, including the determination of a manpower allocation scheme which is required for implementation of the Plan.
- (6) Enactment of laws and issuance of regulations, local ordinances, rules, orders and notifications necessary for implementation of the Plan.
- (7) Scheme for inspection, monitoring and assessment of environmental quality by which the results of implementation of the Plan and enforcement of law related thereto can be evaluated objectively.

Section 37 After the Environmental Quality Management Plan has been published in the Government Gazette, it shall be the duty of the Governor of the Changwat, in which there is a locality designated as environmentally protected area according to section 43, or as pollution control area according to section 59, to formulate an action plan for environmental quality management at Changwat level and submit it to the National Environment Board for approval within one hundred and twenty days from the date on which the Governor of that Changwat is directed by the National Environment Board to prepare the Changwat action

plan for environmental quality management. If, however, there is a reasonable ground, the said duration may be extended as appropriate by the National Environment Board.

In preparing a Changwat Action Plan for the pollution control area according to section 59, the Governor shall incorporate into it the action plan for mitigation and elimination of pollution prepared by the local authority pursuant to section 60 and the local action plan shall form an integral part of the Changwat Action Plan.

In case there is any Changwat, in which no locality is designated as an environmentally protected area according to section 43, or as pollution control area according to section 59, that is nevertheless desirous to enhance and conserve the environmental quality within the limits of its territorial jurisdiction, the Governor of that Changwat may prepare a Changwat Action Plan, within the framework of and in conformity with the requirements of the Environmental Quality Management Plan, and submit it to the National Environment Board for approval.

Section 38 The Changwat Action Plan to be submitted to the National Environment Board shall be an action plan which proposes a system of integrated management of environmental quality in conformity with the guidance specified in the Environmental Quality Management Plan, taking into account the severity of the problems and economic, social and environmental conditions of that Changwat, and should address and contain essential elements in the following matters:

- (1) Plan for control of pollution from point sources.
- (2) Plan for procurement and acquisition of land, materials, equipment, tools and appliances which are essential for the construction, installation, improvement, modification, repair, maintenance and operation of central wastewater treatment plants or central waste disposal facilities belonging to government agency or local administration concerned.
- (3) Plan for collection of taxes, duties and service fees for operation and maintenance of central wastewater treatment plants or central waste disposal facilities referred to in sub-section (2) above.
- (4) Plan for inspection, monitoring and control of wastewaters and other waste matters which are discharged from point sources of pollution.
- (5) Law enforcement plan for the prevention and suppression of violation or infringement of laws and regulations pertaining to pollution control and conservation of nature, natural resources and cultural environment pertaining to aesthetic values.

Section 39 The Changwat Action Plan for environmental quality management to be given first priority for the consideration of the National Environment Board must propose an estimate of budgetary appropriation and allocation from the Fund for the construction or procurement for the acquisition of a central wastewater treatment plant or a central waste disposal facility pursuant to section 38 (2). In case any Changwat is not ready to take steps for the procurement and acquisition of the central wastewater treatment plant or the central waste disposal facility, it may instead propose a plan to promote private investment in the construction and operation of wastewater treatment or waste disposal facilities in order to make available of such services within its jurisdiction.

The Changwat Action Plan to be prepared according to the first paragraph with a request for budgetary appropriation and allocation from the Fund shall be accompanied by drawings, plans, specifications and an estimated price of the project for construction, installation, improvement, modification, repair, maintenance as well as the process and method for operation of the proposed central wastewater treatment plant or central waste disposal facility.

For the purpose of approving the Changwat Action Plan with a request for budgetary appropriation in accordance with the first paragraph, the Office of Environmental Policy and Planning shall be responsible for the gathering and analysis of the Changwat Action Plans for environmental quality management in order to make a proposal for annual budgets of the Office to be earmarked specifically for this purpose.

Section 40 In case the management of environmental quality in any matters will have to be carried out in an area adjoining the territorial jurisdictions of two or more provinces due to the geographical conditions or the characteristics of the natural ecosystems of that area, or for the purpose of a sound, systematic and proper management in accordance with the principle of integrated management of environmental quality and natural resources, the Governors of the relevant provinces shall jointly prepare the action plan mandatory required by section

37.

- Section 41 In case any Changwat, which is mandatory required to prepare the action plan according to section 37, fails or is incapable to evolve such a plan, or has prepared and submitted the plan as required but failed to get the approval of the National Environment Board for any reason, the National Environment Board shall consider the nature of the problems encountered by that Changwat and evaluate whether its environmental quality is adversely affected to such an extent that any action is warrant to rectify the situation. If action is deemed necessary, the National Environment Board shall propose to the Prime Minister to issue an order directing the Ministry of Science, Technology and Environment to prepare the Changwat Action Plan on behalf of the Changwat in question.

Part 3 Conservation and Environmentally Protected Areas

- Section 42 Protection and management of areas within the limits of national parks and wildlife reserves shall be in accordance with the Environmental Quality Management Plan effective by virtue of section 35 and governed by the laws related thereto.

- Section 43 In case it appears that any area is characterized as watershed area, or characterized by unique natural ecosystems which are different from other areas in general, or naturally composed of fragile ecosystems which are sensitive and vulnerable to destruction or impacts of human activities, or worthy of being conserved due to its natural or aesthetic values or amenities, and such area is yet to be designated as a conservation area, the Minister shall, with the advice of the National Environment Board, be empowered to issue ministerial regulation designating such area as an environmentally protected area.

- Section 44 In issuing the ministerial regulation pursuant to section 43, any one or more of the following protective measures shall be prescribed thereunder:

- (1) Land use prescriptions for preserving the natural conditions of such area or for preventing its natural ecosystems or its aesthetic values or amenities from being adversely impacted.
- (2) Prohibition of any acts or activities that may be harmful or adversely affect or change the pristine state of the ecosystems of such area.
- (3) Specifying types and sizes of projects or activities undertaken by government agencies, state enterprises or private entities, to be constructed or operated in such area, which shall have the legal duty to submit reports of environmental impact assessment.
- (4) Determination of management approach and method specific to the management of such area including the scope of functions and responsibilities of relevant government agencies for the purpose of co-operation and co-ordination that are conducive to efficient performance of work towards the preservation of natural conditions or ecosystems or aesthetic values and amenities in such area.
- (5) Prescriptions of any other protective measures which are deemed proper and suitable to the conditions of such area.

- Section 45 In any area, despite having been designated as a conservation area, a master town and country plan area, a specific town and country plan area, a building control area, an industrial estate area pursuant to the governing laws related thereto, or designated as a pollution control area pursuant to this Act, but which nevertheless appears to have been adversely affected by environmental problems which assume a critical proportion to such an extent that an immediate action has become imperative and yet no action is taken by government agencies concerned to rectify the situation due to a lack of clear legal authorization or otherwise failure to do so, the Minister shall, with the approval of the National Environment Board, propose for a cabinet authorization to take any one or several protective measures provided by section 44, as necessary and appropriate, in order to control and solve the problems in such area.

When cabinet authorization is obtained as provided in the first paragraph, the Minister shall, by notification published in the Government Gazette, determine the limits of such area and prescribe in detail the protective measures and the duration for which such measures shall be effectively taken therein.

With the approval of the National Environment Board and the cabinet, the duration of effectiveness specified according to the second paragraph may be extended by notification published in the Government Gazette.

Part 4 Environmental Impact Assessment

- Section 46 For the purpose of environmental quality promotion and conservation, the Minister shall, with the approval of the National Environment Board, have the power to specify, by notification published in the Government Gazette types and sizes of projects or activities, likely to have environmental impact, of any government agency, state enterprise or private person, which are required to prepare reports on environmental assessment for submission to seek approval in accordance with section 47, section 48 and section 49.
- In the notification issued according to the first paragraph, procedures, rules, methods and guidelines shall be laid down for the preparation of environmental impact assessment report for each type and size of project or activity, including related documents that are required to be filed together with the report.
- In case there has been an environmental impact assessment concerning project or activity of any particular type or size, or site selection for such project or activity in any particular area and such assessment can be used as a standard assessment applicable to the project or activity of the same type or size or to the site selection of such project or activity in the area of similar nature, the Minister may, with the approval of the National Environment Board, issue a notification in the Government Gazette exempting such project or activity of the same or similar nature from the requirement of environmental impact assessment, provided that the proponent of such project or activity shall express its consent to comply with various measures prescribed in the environmental impact assessment report which is applicable as the standard for assessment of such project or activity in accordance with the rules and methods specified by the Minister.
- Section 47 In case the project or activity which is required to prepare the environmental impact assessment according to section 46 is the project or activity of a government agency or of a state enterprise or to be jointly undertaken with private enterprise which is required the approval of the cabinet in accordance with official rules and regulations, the government agency or state enterprise responsible for such project or activity shall have the duty to prepare the environmental impact assessment report at the stage of conducting a feasibility study for such project, such report shall be filed with the National Environment Board for its review and comments and then submitted to the cabinet for consideration.
- In considering to give approval to the environmental impact assessment report filed according to the first paragraph, the cabinet may as well request any person or institution, being an expert or specialized in environmental impact assessment, to study and submit report or opinion for its consideration thereof.
- For project or activity of government agency or state enterprise which is not required to be approved by the cabinet according to the first paragraph, the government agency or state enterprise responsible for such project or activity shall prepare and file the environmental impact assessment report in order to obtain approval prior to the initiation of such project or activity in accordance with the rules and procedures as provided by section 48 and 49.
- Section 48 In case the project or activity which is required by section 46 to prepare the environmental impact assessment report is the project or activity which is required by law to obtain permission prior to construction or operation, the person applying for the permission shall have the duty to file the environmental impact assessment report with the permitting authority under such law and with the Office of Environmental Policy and Planning simultaneously. The report to be filed as aforesaid may be made in the form of an initial environmental examination (I.E.E.) in accordance with the rules and procedures determined by the Minister pursuant to section 46, second paragraph.
- The official who is legally authorized to grant permission shall withhold the granting of permission for the project or activity referred to in the first paragraph until having been notified by the Office of Environmental Policy and Planning of the result of consideration pertaining to the review of the environmental impact assessment report in accordance with section 49.
- The Office of Environmental Policy and Planning shall examine the environmental impact assessment report and related documents filed therewith. If it is found that the report as filed is not correctly made in accordance with the rules and procedures specified by virtue of section 46, second paragraph, or the accompanied documents and data are incomplete, the Office of Environmental Policy and Planning shall notify the person applying for permission who files the report within fifteen days from the date of receiving such report.

In case the Office of Environmental Policy and Planning finds that the environmental impact assessment report together with related documents as filed is duly made and completed with the data as required, or has been duly amended or modified in accordance with the foregoing third paragraph, it shall review and make preliminary comments on the report within thirty days from the date of receiving such report in order that the report together with the preliminary comments shall be referred to the committee of experts for further consideration.

The appointment of the committee of experts according to the foregoing fourth paragraph shall be in accordance with the rules and procedures determined by the National Environment Board. The committee shall be composed of expert members who are qualified or specialized in various fields of related disciplines and the authority legally competent to grant permission for the given project or activity under review, or its representative, shall be included in its membership.

Section 49 The review and consideration by the committee of experts according to section 48 shall be carried out within forty-five days from the date of receiving the environmental impact assessment report from the Office of Environmental Policy and Planning. If the committee of experts fails to conclude its review and consideration within the said period, the report shall be deemed to have been approved by it.

In case the committee of experts approves or is deemed to have given approval to the report, the official legally empowered to grant permission shall accordingly order that the permission be granted to the person who applies for it.

In case approval of the report is denied by the committee of experts, the permitting authority shall withhold the granting of permission to the person applying for it until such person will resubmit the environmental impact assessment report that has been amended or entirely redone in conformity with the guidelines and detailed requirements determined by the order of the committee of experts.

When such person has resubmitted the environmental impact assessment report that has been amended or entirely redone, the committee of experts shall review and conclude its consideration within thirty days from the date of receiving the resubmitted report, If the committee of experts fails to conclude its review and consideration within the said period, it shall be deemed that the committee has approved the report and the permitting authority shall accordingly grant permission to the person who applies for it.

In case it is deemed reasonable the Minister may issue notification in the Government Gazette requiring that the project or activity of the type and size specified by the notification issued by virtue of section 46 also file the environmental impact assessment report when the application is made for renewal of permission for such project or activity in accordance with the same procedures as applicable to the application for the permission.

Section 50 For the purpose of review and consideration of the environmental impact assessment report pursuant to section 48 and section 49 and site inspection is deemed appropriate, the committee of experts or the competent official assigned by the committee shall be authorized to inspect the site of the project or activity identified in the report for which approval thereof is sought.

When the committee of experts has approved the environmental impact assessment report pursuant to section 49, the official who is legally competent to grant permission or the renewal of permission shall stipulate as the conditions of permission or renewal thereof all the mitigation measures proposed in the environment impact assessment report and all such conditions shall be deemed the conditions prescribed by virtue of the governing laws on the subject matter.

Section 51 For the purpose of compliance with section 47 and section 48, the Minister may, with the approval of the National Environment Board, require that the environmental impact assessment report as required by section 46 be prepared or certified by the person who is licensed to be a specialist in environmental impact assessment.

Application and issuance of license, qualifications of specialists who will be eligible to prepare environmental impact assessment reports, control of the licensee's performance, renewal of license, issuance of certificate in lieu of the license, suspension or revocation of the license and fee payments for the application and issuance of license shall be in accordance with the rules, procedures and conditions stipulated by ministerial regulation.

Chapter IV Pollution Control

Part 1 Pollution Control Committee

Section 52 For the purpose of pollution control under this Act, there shall be a committee called the "Pollution Control Committee" (PCC) which consists of the Permanent Secretary of the Ministry of Science, Technology and Environment as the Chairman, the Director-General of the Department of Local Administration, the Director-General of the Police Department, the Director-General of the Department of Land Transport, the Director-General of the Harbor Department, the Director-General of the Department of Public Works, the Director-General of the Department of Mineral Resources, the Director-General of the Department of Industrial Works ' the Director-General of the Health Department, the Director-General of the Department of Agriculture, the Director-General of the Department of Environmental Quality Promotion, the Secretary-General of the Office of Environmental Policy and Planning, the Permanent Secretary for the Bangkok Metropolitan Administration and not more than five qualified persons appointed by the National Environmental Board as members and the Director-General of the Department of Pollution Control as member and secretary.

Section 14 and section 15 shall apply mutatis mutandis to the holding office of the qualified members in the Pollution Control Committee.

Section 53 The Pollution Control Committee shall have the power and duty as follows:

(1)To submit an action plan for prevention or remedy of pollution hazards or contamination to the National Environment Board.

(2)To give opinion and recommend the National Environment Board on proposed amendments to or improvement of any laws concerning the control, prevention, reduction or eradication of pollution.

(3)To propose incentive measures regarding taxation and private, investment promotion in relation to pollution control and promotion and conservation of environmental quality to the National Environment Board.

(4)To recommend the National Environment Board on the determination of service fee rates for the central waste water treatment or central waste disposal services of the government.

(5)To give advice to the Minister on the setting of emission or effluent standards under section 55.

(6)To give advice to the Minister concerning the types of point sources of pollution that will be required to comply with section 68 and section 69.

(7)To make recommendation on the issuing of ministerial regulations specifying the types and categories of hazardous wastes under section 79.

(8)To coordinate government agencies, state enterprises and the private sector in their actions to control, prevent, mitigate or eradicate pollution.

(9)To prepare and submit the report on pollution situation to the National Environment Board once a year.

(10)To consider and resolve on the challenge to the order of the pollution control official under this Act.

(11)To perform other functions designated by this Act or other law to be the power and duty of the Pollution Control Committee.

(12)To carry out other matters assigned by the National Environment Board.

The Pollution Control Committee may appoint a subcommittee to consider or carry out any matter as may be assigned by the Pollution Control Committee.

Section 54 Section 16, section 17 and section 20 shall apply mutatis mutandis to the performance of functions of the Pollution Control Committee and subcommittee.

Part 2 Emission or Effluent Standards

Section 55 The Minister shall, with the advice of the Pollution Control Committee and the approval of the National Environment Board, have the power to publish notification in the Government Gazette prescribing emission or effluent standards for the control of wastewater discharge, polluted air emissions, or discharge of other wastes or pollutants from point sources into the environment, in order to meet the environmental quality standards set by virtue of this Act for the conservation of national environmental quality.

Section 56 In case there have been standards prescribed by virtue of the other laws concerning wastewater discharges, polluted air emissions, or discharge of other wastes or pollutants

from point sources of pollution into the environment and such standards are no less stringent than the emission or effluent standards set by the Minister by virtue of section 55, such standards shall continue to be effective by virtue of the laws related thereto. If however, such standards are less stringent than the emission or effluent standards set by the Minister pursuant to section 55, the government agencies empowered by such laws shall amend such standards in conformity with the emission or effluent standards under this Act. If there is any obstacle preventing from doing so, the National Environment Board shall resolve on such matter and the government agencies concerned shall act in accordance with such resolution.

Section 57 In case any government agency is empowered by the other law to prescribe emission or effluent standards in any matter, but that government agency fails to exercise its power, the Minister shall, with the recommendation of the Pollution Control Committee and with the approval of the National Environment Board, publish notification in the Government Gazette prescribing the emission or effluent standards in question and such standards shall be deemed to have been set by the governing law on such matter.

Section 58 If it is deemed reasonable, the Changwat Governor shall have the power to publish notification in the Government Gazette prescribing a special set of emission or effluent standards applicable to the pollution control area designated by section 59, higher than the standards set pursuant to section 55 or the standards set by virtue of other law which remain in force according to section 56.

Part 3 Pollution Control Area

Section 59 In case it appears that any locality is affected by pollution problems and there is a tendency that such problems may be aggravated to cause health hazards to the public or adverse impact on the environmental quality, the National Environment Board shall have power to publish notification in the Government Gazette designating such locality as a pollution control area in order to control, reduce and eliminate pollution.

Section 60 For the purpose of the Changwat Action Plan for environmental quality management to be prepared according to section 37, the local official in the locality designated as the pollution control area pursuant to section 59, shall prepare and submit an action plan for reduction and eradication of pollution in such area to the Changwat Governor in order to incorporate such plan into the Changwat Action Plan for environment quality management.
In preparing the action plan for reduction and eradication of pollution, steps shall be taken as follows :

(1) to survey and collect data concerning point sources of pollution located within the limits of that pollution control area.

(2) to make an inventory showing the number, type and size of point sources of pollution under survey and collection of data according to (1) above.

(3) to study, analyze and assess the state of pollution, as well as the scope, nature, severity of the problem and impacts on environmental quality in order to specify suitable and necessary measures for mitigation and eradication of pollution in that pollution control area.

The pollution control official shall give advice and assistance to the local official necessary for the preparation of the action plan to reduce and eradicate pollution according to the first and second paragraphs.

Section 61 The action plan for reduction and eradication of pollution in the pollution control area under section 60 shall propose the estimation and request for government budget and Fund allocations for construction or operation of the central wastewater treatment plant or the central waste disposal facility necessary to reduce and eradicate pollution in that pollution control area.

Section 62 In case it is necessary to acquire a piece of land to be used as the site of the central wastewater treatment or central waste disposal facility for any pollution control area but state-owned land is not available, steps shall be taken to select and acquire land for the siting purpose. If there are expenses, the estimate and request for government budget and Fund allocation shall be made in the Changwat Action Plan.

If it is unable to proceed under the first paragraph, suitable land shall be selected and proposed to the Minister in order to take steps to expropriate such land in accordance with the law on expropriation of immovable property.

Section 63 The Changwat Governor shall supervise and oversee the local official's actions under section 59. If no action is taken by the local official within a reasonable time, the Changwat Governor shall have the power to take action on behalf of the local authority upon notification to such local authority and the National Environment Board.

Part 4 Air and Noise Pollution

Section 64 Usable vehicle shall conform to the emission standards prescribed for such vehicle pursuant to section 55.

Section 65 If it is found that the use of any vehicle is in violation of section 64, the competent official shall have the power to prohibit the use of such vehicle permanently or until it will have been modified or improved to meet the emission standard requirements prescribed pursuant to section 55.

Section 66 In issuing the order prohibiting to use of vehicle according to section 65, the competent official shall make the sign clearly shown by the words "Use Prohibited Permanently" or "Use Prohibited temporarily" or any other sign, known and understood by the general public to have the same meaning, on any part of such vehicle.

The making or removal of the sign under the first paragraph, or the use of vehicle while the said sign is on, shall be in accordance with the rules, methods and conditions specified in the ministerial regulation.

Section 67 In performing his duty under section 65, the competent official has the power to stop and inspect the vehicle, enter into the vehicle or to do any act necessary to check and test the engine and equipment of such vehicle.

Section 68 The Minister shall, with the advice of the Pollution Control Committee, have the power to publish notification in the Government Gazette specifying the types of point sources of pollution that shall be controlled in regard to the emission of polluted air, ray, or other pollutants, in the form of smoke, fume, gas, soot, dust, ash, particle or any other form of air pollutant, to the atmosphere, in conformity with the emission standards prescribed under section 55, or standards prescribed by any government agency by virtue of the other law which remain in force according to section 56, or standards set by the Changwat Governor in special case for the pollution control area according to section 58.

The owner or possessor of the point source of pollution under the first paragraph has the duty to install or bring into operation an on-site facility for air pollution control, equipment or other instrument as determined by the pollution control official in order to control, dispose, reduce or eliminate pollutants which may affect the air quality, unless such facility, equipment or instrument has already been in place and still in a working condition upon the inspection and test by the pollution control official. For the purpose of this section, the pollution control official may also require that the operation of such facility, equipment or instrument be controlled by the Monitoring Control Operator.

The provisions of the first and second paragraphs shall apply mutatis mutandis to the point source of pollution which emit or generate noise or vibration in excess of the emission standards set pursuant to section 55, or the standards set by any government agency by virtue the other law which remain in force according to section 56, or the standards set by the Changwat Governor in special case for the pollution control area according to section 58.

Part 5 Water Pollution

Section 69 The Minister shall, with the advice of the Pollution Control Committee, have the power to publish notification in the Government Gazette specifying the types of point sources of pollution that shall be controlled in regard to the discharge of wastewaters or wastes into public water sources or into the environment outside the limits of such point sources, in conformity with the effluent standards set pursuant to section 55, or the standards set by any government agency by virtue of the other law which remain in force according to section 56, or the standards set by the Changwat Governor in special case for the pollution control area according to section 58.

Section 70 The owner or possessor of the point source of pollution under section 69 has the duty to construct, install or bring into operation an on-site facility for wastewater treatment or waste disposal as determined by the pollution control official. For this purpose, the

- pollution control official may also require that such owner or possessor commission a Monitoring Control Operator to control the wastewater treatment or waste disposal facility that shall be constructed, installed or brought into operation accordingly.
- If any point source of pollution has had an on-site facility for wastewater treatment or waste disposal before the date of notification of the Minister under section 69, the owner or possessor of such point source of pollution shall inform the pollution control official to check the functioning system of the facility. If its capability to treat wastewaters or dispose of wastes fails to meet the applicable standards, the owner or possessor has the duty to modify or improve it in conformity with the pollution control official's directions.
- Section 71 In any pollution control area or locality where a central wastewater treatment plant or a central waste disposal facility has been brought into operation by the administration concerned, the owner or possessor of the point source of pollution according to section 70, first paragraph, who has not yet constructed, installed or brought into operation the on-site facility for wastewater treatment or waste disposal according to the prescription of the pollution control official, or may not want to construct or make arrangements for such a system, shall have the duty to send the wastewaters or wastes generated by his activities to the central wastewater treatment plant or central waste disposal facility in the pollution control area or in that locality for treatment or disposal and shall have the duty to pay the service fees at the rates fixed by virtue of this Act or the other related laws.
- Section 72 In any pollution control area or locality where the central waste water treatment plant or central waste disposal facility has been brought into operation by the administration concerned, the owner or possessor of any point source of pollution, except those under section 69, shall have the duty to send wastewaters or wastes from his source of pollution to the central waste water treatment plant or the central waste disposal facility in that pollution control area or locality for treatment or disposal and shall have the duty to pay service fees at the rates fixed by virtue of this Act or the other related laws, except such point source of pollution has already had its own wastewater treatment or waste disposal facility which is capable to meet the standards prescribed under this Act.
- Section 73 No person shall be employed as a Monitoring Control Operator or as a Service Contractor, who renders for hire the services of wastewater treatment or waste disposal, without obtaining the license from the local official.
- Application and issuance of license, qualifications of the applicant, control of the licensee's performance, renewal of license, issuance of certificate in lieu of the license, suspension or revocation of the license and fee payments for the application and issuance of license shall be in accordance with the rules, procedures and conditions stipulated by ministerial regulation.
- The person who has obtained a license to be a Service Contractor shall also be deemed to have obtained a license to be a Monitoring Control Operator.
- In rendering the services of wastewater treatment or waste disposal by the Service Contractor according to the first paragraph, the service charges shall not exceed the rates fixed by the ministerial regulation.
- Section 74 In any pollution control area or locality where the central wastewater treatment or central waste disposal facility of the public service is yet to be put into operation, but there is nonetheless a Service Contractor who is licensed to render such services within that area, the owner or possessor of the point source of pollution according to section 70 and section 71 shall be required to send the wastewaters or wastes from his point source for treatment or disposal by such Service Contractor in accordance with the rules, regulations, methods and conditions prescribed by the local official, with the advice of the pollution control official.
- Section 75 In any pollution control area or locality where the central wastewater treatment or central waste disposal facility is yet to be put into service by the government and there is no licensed Service Contractor rendering services therein, the local official may, with the advice of the pollution control official, determine a temporary method necessary for the treatment of wastewaters or disposal of wastes from point sources of pollution under section 70 and section 71 until the central wastewater treatment or central waste disposal facility will have been constructed, installed and put into operation within such pollution control area or locality.

The temporary method for wastewater treatment or waste disposal according to the first paragraph shall mean to include the collection, transport or conveyance of wastewaters or wastes by whatever appropriate means to be treated or disposed by the central wastewater treatment plant or central waste disposal facility of the government in the other area; or to allow the licensed Service Contractor rendering services in the other area to render the same services in that pollution control area or locality temporarily; or to allow such licensed Service Contractor to collect and transport wastewaters or wastes to treat or dispose by his own wastewater treatment or waste disposal facility located outside that pollution control area or locality.

Section 76 Wastewaters treated by either the central wastewaters treatment plant of the government or by the wastewater treatment facility of the Service Contractor must also have the properties which meet the requirements of the effluent standards prescribed by virtue of section 55, or the standards prescribed by virtue of the other law which remain in force according to section 56, or the standards set by the Changwat Governor in special case for the pollution control area according to section 58.

Section 77 The government agency or the local authority which makes provision for the services of central wastewater treatment or central waste disposal facilities by using government budget, or revenues of the local authority, and Fund allocations under this Act shall be responsible for the management and control of such facilities. In this respect, the responsible agency or local authority may employ a licensed Service Contractor under this Act to manage and control the operation of such facilities.

Regulations, rules and methods for conveyance, collection and transport of wastewaters or wastes from the point sources of pollution to the central wastewater treatment plant or central waste disposal facility as well as prescriptions, prohibitions, restrictions and other conditions for discharging and draining of wastewaters or wastes from factories and other point sources of pollution under section 72 into the systems of central wastewater treatment or central waste disposal facilities shall be prescribed by the ministerial regulation.

Part 6 Other Pollution and Hazardous Waste

Section 78 The collection, transport and other arrangements for the treatment and disposal of garbage and other solid wastes; the prevention and control of pollution from mining both on land and in the sea; the prevention and control of pollution from the exploration and drilling for oil, natural gas and all kinds of hydrocarbon both on land and in the sea; and the prevention and control of pollution resulting or originated from the discharge of oil and the dumping of wastes and other matters from sea-going vessels, tankers, and other types of vessel, shall be in accordance with the governing laws related thereto.

Section 79 In case there is no specific law applicable thereto, the Minister shall, with the advice of the Pollution Control Committee, have the power to issue ministerial regulation specifying the types and categories of hazardous wastes generated from the production and usage of chemicals or hazardous substances in the production process of industry, agriculture, sanitation and other activities which shall be brought under control. For this purpose, rules, regulations, measures and methods must also be prescribed for the control of collection, storage, safety measures, transportation, import into the Kingdom, export out of the Kingdom, and for proper and technically sound management, treatment and disposal of such hazardous wastes.

Part 7 Monitoring, Inspection and Control

Section 80 The owner or possessor of the point source of pollution, required by virtue of section 68 or section 70, to have his own facility for treatment of polluted air, equipment or instrument for control of the discharge of polluted air or other pollutants or the wastewater treatment or waste disposal facility, shall have the duty to collect statistics and data showing the daily functioning of the said facility or equipment and instrument, and make detailed notes thereof to be kept as recorded evidence at the site of that point source of pollution, and shall submit report summarizing the functioning results of the facility, equipment or instrument to the local official of the locality where such point source is situate at least once a month. The collection of statistics and data, the making of notes and reports shall be in accordance with the rules, procedures, methods and format specified by ministerial regulation.

In case the facility for treatment of polluted air, wastewaters or waste disposal or equipment and instrument indicated in the first paragraph requires a Monitoring Control Operator as determined by the pollution control official, the Monitoring Control Operator shall have the duty to act under the first paragraph on behalf of the owner or possessor.

The Service Contractor licensed to render wastewater treatment or waste disposal services shall have the duty to do the same as the owner or possessor of the point source of pollution is required under the first paragraph.

Section 81 The local official shall gather the reports received according to section 80 and send them to the pollution control official, who has jurisdiction over that locality, on a regular basis at least once a month. In doing so, the local official may make comments for consideration of the pollution control official.

Section 82 In order to perform his functions under this Act, the pollution control official is empowered as follows:

(1) To enter into the building, place and site of the factory or point source of pollution or the site of wastewater treatment or waste disposal facility which belongs to any person, between the sun rise and sun set or during the working hours, to inspect the functioning process of wastewater treatment or waste disposal facility, air pollution control system or equipment and other instrument for the control of polluted air or other pollutants, as well as to examine the notes, statistics or data on the functioning of the said facility, equipment and instrument, or when there is a reasonable suspicion that there is a non-compliance with this Act.

(2) To issue an order in writing directing the owner or possessor, the Monitoring Control Operator, or the licensed Service Contractor rendering the services of wastewater treatment or waste disposal, to correct, change, improve or repair the air pollution control, wastewater treatment or waste disposal facility or other equipment and instrument for the control of polluted air or other pollutants. If however, the point source of pollution is a factory, the official under the law on industrial plants shall be notified to take action within his power and duty. If such official fails to do so, the pollution control official shall have the power to take action in accordance with this Act.

(3) To issue a written order directing the owner or possessor of the point source of pollution which is not a factory to pay penalties as provided under section 90, section 91 or section 92. If the point source of pollution is a factory the official under the law on industrial plants shall be notified to order the owner or possessor of such factory to pay the penalties and, in doing so, such official under the law on industrial plants shall be deemed to be the pollution control official under this Act. If, however, such official fails to issue the penalty order within a reasonable time, the pollution control official shall then have the power to issue the order directing the owner or possessor of such factory to pay the penalties.

(4) To issue a written order directing the Service Contractor licensed to render the services of wastewater treatment or waste disposal to stop or shut down his services, or revoking his license in case such Service Contractor violates or does not comply with this Act, or any ministerial regulation, local ordinance, rule, notification or condition issued or stipulated by virtue of this Act, or does not comply with the order of the pollution control official issued by virtue of this Act.

(5) To issue a written order suspending the Monitoring Control Operator under section 68 or section 70 in case such Monitoring Control Operator violates or does not comply with this Act, or any ministerial regulation, local ordinance, rule, notification, or condition issued or stipulated by virtue of this Act, or does not comply with the order of the pollution control official issued by virtue of this Act.

Section 83 In case it is deemed reasonable in the interest of co-ordination of action among agencies concerned, the pollution control official may:

(1) Recommend the official who has the legal power to control the point source of pollution, to close down its operation, to suspend or revoke the license of its owner or operator, or to bar its use or utilization in any way, especially in connection with the point source of pollution under section 68, section 69 or section 74 which has no intention to treat the polluted air, wastewaters or other wastes and illegally discharges the untreated wastes into the environment outside the limits of its site and premise.

(2) Recommend the local official to take legal action against the owner or possessor of the point source of pollution under section 71 or section 72 in order to coerce him to send wastewaters or wastes to be treated or disposed in accordance with this Act.

(3) Give advice and suggestions to the local official or the government agency concerned in connection with the operation and maintenance of the central wastewater treatment plant or the central waste disposal facility under the responsibility of such local official or government agency.

Section 84 In the performance of duty under this Act, the competent official or the pollution control

official must produce his identity card at the request of the person concerned.

The identity card of the competent official and pollution control official shall be in such a form as prescribed in the ministerial regulation.

Section 85 The owner or occupier of premises, vehicles or any person concerned shall facilitate the performance of duty under this Act by the competent official or the pollution control official who shall be official under the Penal Code.

Section 86 The performance of duty by the competent official under section 50, first paragraph, or section 65 and the performance of duty by the pollution control official under section 82 (1) shall be done in the presence of the owner or occupier of the premise or vehicles; if such person cannot be found, it shall be done in the presence of at least two other persons requested by the competent official or the pollution control official to attend as witnesses.

Section 87 The owner or possessor of the point source of pollution, the Service Contractor licensed to render services of wastewater treatment or waste disposal, the Monitoring Control Operator or any other person who is not satisfied with the order of the pollution control official under section 82 (2), (3), (4) or (5), is entitled to challenge such order by petition to the Pollution Control Committee within thirty days form the date of receiving the order of the pollution control official.

If the petitioner does not agree with the decision of the Pollution Control Committee, he shall appeal to the Minister within thirty days from the date of receiving notification of the Pollution Control Committee's decision.

The decision of the Minister shall be final.

Part 8 Service Fee and Penalty

Section 88 In any pollution control area or locality where a central wastewater treatment plant of a central waste disposal facility has been constructed and brought into operation as a public utility service, funded by government budget or revenue of the local administration and money allocated from the Fund as provided in this Act, the National Environment Board shall, with the advice of the Pollution Control Committee, fix the rates of service fee to be applicable within the limits of each pollution control area or locality, being the site of and served by the operation of such facility.

The service fee rates fixed according to the foregoing first paragraph shall be notified and published in the Government Gazette.

Section 89 The rates of service fee fixed according to section 88 for treatment of wastewaters or for disposal of wastes emanated from point sources pursuant to section 71 and section 72 may be varied as appropriate.

The owner or possessor of the point source of pollution governed by the provision of section 72, in the category of domestic household, that can be classified as a small-scale user is entitled to be exempted from the payment of service fees in accordance with the rules and conditions stipulated by the National Environment Board, with the advice of the Pollution Control Committee.

Section 90 Any owner or possessor of point source of pollution who avowedly refrains from sending wastewaters or wastes to the central wastewater treatment plant or the central waste disposal facility as required by section 71 or section 72 and illegally discharges such wastewaters or wastes into the environment outside the limits of the site of the point source owned or possessed by him, or does send the wastewaters or wastes to the central wastewater treatment plant or the central waste disposal facility of the public service for treatment but fails or refuses to make payment for the service fees without being entitled to the exemption as provided by section 89, second paragraph, shall be liable to pay as a penalty four time as much the amount of service fee that he is liable to pay at the rate fixed in accordance with section 88 until the provision of this Act is observed by him.

Section 91 Any owner or possessor of the point source of pollution, required by section 70 to have an on-site facility for wastewater treatment or waste disposal, who illegally discharges wastewaters or wastes into the central wastewater treatment plant or the central waste disposal facility of the public service, shall be liable to pay as a daily penalty four time as much the amount of daily expenses for the normal operation of his on-site facility for wastewater treatment or waste disposal throughout the duration of such illegal discharge and shall also be liable to pay damages if such illegal discharge has caused any damage or

defection to the central wastewater treatment plant or the central waste disposal facility of the public service.

Section 92 Any owner or possessor of the point source of pollution subject to the requirements of section 68 or section 70, who refrains from using his on-site facilities or equipment for the control of air pollution, noise pollution and vibrations, or refrains from operating his on-site facilities for the treatment of wastewaters or disposal of wastes and illegally discharges such untreated wastewaters or wastes into the environment outside the limits of the site of the point source of pollution, shall be liable to pay as a daily penalty four time as much the amount of daily expenses for the normal operation of his facilities, equipment or process for wastewater treatment or waste disposal throughout the duration of such illegal discharge.

Section 93 The local authority or the competent official of the government agency responsible for the operation of the public wastewater treatment plant or waste disposal facility shall have the power and duty to collect service fees, penalties and claim for damages as provided in this Part, particularly in connection with the operation of the central wastewater treatment plant or the central waste disposal facility of the public service which is made available by such local authority or government agency.

The service fees and penalties collectable in accordance with the foregoing first paragraph shall be exempted from being remitted to the Treasury as government revenues, but shall be deducted and remitted to the Fund at the ratio specified by the Fund Committee, whereas the balance therefrom shall be used as expenditures for operation and maintenance of the central wastewater treatment plant or the central waste disposal facility of the local authority or government agency which is responsible to collect such service fees and penalties.

Chapter V Promotional Measures

Section 94 The owner or possessor of any point source of pollution, who has the duty according to this Act or other related laws to install an on-site facility for treatment of polluted air or wastewaters or for disposal of any other wastes, including the procurement of equipment, instrument, tools, appliances or materials necessary for control of pollution from such point source, or the Service Contractor licensed pursuant to this Act, is entitled to request for promotional supports and assistance from the government service in the following matters:

- (1) Request for assistance regarding import duties for the import into the Kingdom of necessary machinery, equipment, instrument, tools, appliances or materials which are not available in the Kingdom.
- (2) Application for permission to bring foreign experts or specialists into the country to carry out works concerning the installation, monitoring, control or operation of air pollution control systems, wastewater treatment works or waste disposal facilities in case qualified persons within the Kingdom are not available for recruitment and commissioning to supervise and control machinery, equipment, instrument or tools imported into the Kingdom pursuant to sub-section (1), including application for exemption of income tax that will incur from the performance of work as a supervisor of such person within the Kingdom.

The owner or possessor of the point source of pollution who has no legal duty as referred to in the foregoing first paragraph, but nonetheless wishes to install an on-site facility with his own equipment, instrument, tools or appliances for air pollution control, wastewater treatment or for disposal of other wastes emanated from his activities or business undertakings, is also entitled to request for promotional supports and assistance from the government service in accordance with the foregoing first paragraph.

Section 95 The request for promotional supports and assistance according to section 94 shall be made to the National Environment Board in accordance with the rules, procedures, methods and formats prescribed by ministerial regulation.

The National Environment Board shall consider and proceed with the request for promotional supports and assistance according to the foregoing first paragraph as it sees fit, taking into account the economic, financial and investment necessities of each individual applicant. In case it is considered appropriate to give assistance to the applicant, the National Environment Board shall recommend the government agencies concerned to act within their powers and functions to render promotional supports and assistance to the

applicant accordingly.

Chapter VI Civil Liability

Section 96 If leakage or contamination caused by or originated from any point source of pollution is the cause of death, bodily harm or health injury of any person or has caused damage in any manner to the property of any private person or of the State, the owner or possessor of such point source shall be liable to pay compensation or damages therefor, regardless of whether such leakage or contamination is the result of a willful or negligent act of the owner or possessor thereof, except in case it can be proved that such pollution leakage or contamination is the result of:

(1) Force majeure or war.

(2) An act done in compliance with the order of the Government or State authorities.

(3) An act or omission of the person who sustains injury or damage, or of any third party who is directly or indirectly responsible for the leakage or contamination.

The compensation or damages to which the owner or possessor of the point source of pollution shall be liable according to the foregoing first paragraph shall mean to include all the expenses actually incurred by the government service for the clean-up of pollution arisen from such incident of leakage or contamination.

Section 97 Any person who commits an unlawful act or omission by whatever means resulting in the destruction, loss or damage to natural resources owned by the State or belonging to the public domain shall be liable to make compensation to the State representing the total value of natural resources so destroyed, lost or damaged by such an unlawful act or omission.

Chapter VII Penal Provisions

Section 98 Any person who violates or refuses to observe the order issued by virtue of section 8 or obstructs any act done in compliance with such order shall be punished by imprisonment not exceeding one year or fine not exceeding one hundred thousand baht, or both.

In case the person who violates or refuses to observe the order or obstructs any act done in compliance with such order is the person who has caused danger or damage arisen from pollution, such person shall be punished by imprisonment not exceeding five years or fine not exceeding five hundred thousand baht, or both.

Section 99 Any person who illegally encroaches upon, occupies, or enters into public land to act in any manner which results in the destruction, loss or damage to natural resources or treasures worthy of being conserved, or causes the occurrence of pollution having impact on the environment within the limits of environmentally protected area designated by virtue of section 43 shall be punished by imprisonment not exceeding five years or fine not exceeding five hundred thousand baht, or both.

Section 100 Any person who violates or refrains from observing the restrictions stipulated by ministerial regulation issued according to section 44 or by notification given by the Minister according to section 45 shall be punished by imprisonment not exceeding one year or fine not exceeding one hundred thousand baht, or both.

Section 101 Any person who spreads or disseminates false information about the danger from any point source of pollution with the intention to destroy its reputation or to undermine public trust on the lawful operation of its business or activity shall be punished by imprisonment not exceeding one year or fine not exceeding one hundred thousand baht, or both.

If the spread or dissemination of information according to the foregoing first paragraph is done by means of publication, announcement, advertisement or reports through newspaper, radio, television or other forms of mass media, the person who commits such act shall be punished by imprisonment not exceeding five years or fine not exceeding five hundred thousand baht, or both.

Section 102 Any person who violates the order of competent official forbidding the use of vehicle according to section 65 shall be punished by fine not exceeding five thousand baht.

Section 103 Any person who refuses to observe the order given by competent official according to section 67 shall be punished by imprisonment not exceeding one month or fine not exceeding ten thousand baht, or both.

- Section 104 Any owner or possessor of the point source of pollution who refrains from observing the provision of section 71, or any person who refrains from observing the provision of section 72, or the rules laid down by the local authority by virtue of section 74 or section 75, first paragraph, or the ministerial regulation issued by virtue of section 80 shall be punished by imprisonment not exceeding one year or fine not exceeding one hundred thousand baht, or both.
- Section 105 Any person who renders services as a Monitoring Control Operator or as a Service Contractor for wastewater treatment or waste disposal without the license granted according to section 73 shall be punished by imprisonment not exceeding one year or fine not exceeding one hundred thousand baht, or both.
- Section 106 Any owner or possessor of the point source of pollution or any Monitoring Control Operator or any Service Contractor rendering the services of wastewater treatment or waste disposal, who refrains from collecting statistics or data or from making notes or reports as required by Section 80 shall be punished by imprisonment not exceeding one month or fine not exceeding ten thousand baht, or both.
- Section 107 Any Monitoring Control Operator or Service Contractor having the duty to make notes or reports according to this Act, who intentionally makes such notes or reports showing false information or statements shall be punished by imprisonment not exceeding one year or fine not exceeding one hundred thousand baht, or both.
- Section 108 Any person who obstructs or refuses to comply with the order of the pollution control official given in the performance of his duty according to Section 82 (2) shall be punished by imprisonment not exceeding one month or fine not exceeding ten thousand baht, or both.
- Section 109 Any Service Contractor rendering services for wastewater treatment or waste disposal ordered by the pollution control official to stop or close down his services pursuant to Section 82 (5), or any Monitoring Control Operator whose license has been revoked by the order of the pollution control official pursuant to Section 82 (6), who violates or refuses to comply with such order of the pollution control official or continues to carry on his service in violation of such order shall be punished by imprisonment not exceeding one year or fine not exceeding one hundred thousand baht, or both.
- Section 110 Any owner or possessor of the point source of pollution who employs the person, whose license to be a Monitoring Control Operator has been revoked, to supervise and monitor the operation of air pollution control, wastewater treatment or waste disposal facility that he has the duty install and operate according to this Act, shall be punished by fine not exceeding fifty thousand baht.
- Section 111 In case the offender who is liable to be punished according to this Act is a juristic person, the directors or managers of such juristic person, or any person who is responsible for the business operation of such juristic person, shall also be punishable by the same penalties prescribed by law for such offence, unless it can be proved that they have no part to play in the commission of such offence.

Interim Provisions

- Section 112 In the period during which the National Environment Board is yet to be appointed in accordance with section 12 of this Act, the National Environment Board appointed prior to the date of effectiveness of this Act shall continue to hold office in order to perform its function until the new Board shall be appointed and take over the office.
- Section 113 All ministerial regulations, rules, procedures, notifications or orders, issued by, virtue of the Enhancement and Conservation of National Environmental Quality Act, B.E. 2518 which remain in force on the date of effectiveness of this Act, shall continue to be effective, insofar as they are not in conflict with or contrary to this Act, unless and until ministerial regulations, rules, procedures, notifications or orders will have been issued in accordance with this Act.
- Section 114 The person, who has been holding a license as an eligible person to prepare reports concerning the study and measures for the prevention of and remedy for the adverse effect on environmental quality by virtue of the Enhancement and Conservation of National Environmental Quality Act, B.E. 2518, shall continue to be eligible to prepare the environmental impact assessment report provided by this Act, until such person is required

by the Minister to apply for license in accordance with this Act.

Section 115 For all the reports concerning the study and measures for the prevention of and remedy for the adverse effect on environmental quality required for any project or activity pursuant to the Enhancement and Conservation of the National Environmental Quality Act, B.E. 2518, that have been filed prior to the date on which this Act shall come into effect and still pending review by the Office of National Environment Board, the review and approval of such reports shall be further proceeded with in accordance with the rules and procedures laid down by virtue of the Enhancement and Conservation of National Environmental Quality Act, B.E. 2518. For this purpose, the power and duty of the Office of National Environment Board in become the power and duty of the Office of Environmental Policy and Planning.

Appendix 2
Notification of Ministry of Industry No. 6, B.E. 2540, A.D.
1997 Prescribing Treatment of Hazardous Waste Substances

Notification of Ministry of Industry No. 6, B.E. 2540, A.D. 1997
Prescribed Pursuant to the Factory Acts B.E. 2535
Treatment of waste or disused substances

Notified on 29 October, B.E. 2540

Published in the Government Gazette, Volume 114, Special Part 106 (Ngo) dated 13th November B.E. 2540

Under Section 13(3), 13(3)(Kor) and 13(3)(Khor) of Decree law Ref. 2/2535 prescribed pursuant to the Factory Act B.E. 2535, the minister of industry has proclaimed the following.

- 1 A person engaging in a factory business, who possesses waste or disused substances of which properties and characteristics defined in the appendix 1 at the end of this notification, has to manage to treat the waste or disused substances as defined in 2 and 3.
- 2 Prohibit to take the waste or disused substances as indicated in 1 out of the factories. With the exception that there was a permission from the minister of industry or a person entrusted by the minister of industry for detoxification, disposal, discharge or landfill according to the standards and methods defined in the appendix 2 at the end of this notification.
- 3 Report details regarding types, quantities, properties, characteristics and storage sites of the waste or disused substances including the methods of preservation, detoxification, disposal, discard, transfer and transportation using the forms Ro-Ngo 6 attached at the end of this notification to the Department of Industrial Work within 60 days counting from the date this notification comes into force. With the exception that a person engaging in a factory business who operates a factory after this notification comes into force, shall report the details within 90 days counting from the start of operation and shall report the detail next time within 30 December of each year. The report can be sent by the registered mail presuming that the postal delivering day is the reporting day.

This notification shall come into force as from the day following the day of its publication in the government Gazette.

Appendix 1

A list of properties and characteristics of waste or disused substances
Attached to the Notification of Ministry of Industry No.6, B.E. 2540

Part 1

Waste or disused substances in the forms of ignitable substances, corrosive substances, reactive substances, toxic substances and leachable substances.

Section 1 Ignitable substances, which have the following properties and characteristics.

- 1.1 A liquid substance of which flash point is lower than 60 °C (140 °F) excluding aqueous solution containing alcohol less than 24% by volume. The testing or analytical method is done by using the apparatus, Pensky Martens Closed Cup Tester according to the standard testing method of ASTM D-93-79 or D-93-80 or by using the apparatus Setaflash Closed Cup Tester according to the standard testing method of ASTM D-3278-78.
- 1.2 Non liquid substances, which can cause ignition when undergone friction, moisture, spontaneous chemical changes. Once ignited. it burns intensively and continuously causing severe danger under standard temperature and pressure. (pressure at 1 atm and temperature at 0 °C).
- 1.3 Ignitable compressed gas which is any substance or mixture contained in vessels at the absolute pressure more than 2.81 kg/cm² (40 psi) and at the temperature of 21 °C (70°F) or at the absolute pressure more than 7.31 kg/cm² (104 psi) and at the temperature of 55 °C (130°F). The testing or analytical method follows the standard testing method of ASTM D-323.
- 1.4 Oxidizer, which can oxidize rapidly and stimulate the combustion of organic compounds

for example, the compounds of chlorate permanganate inorganic peroxide and nitrate.

- Section 2 Corrosive substances, which have the following properties and characteristics.
- 2.1 Aqueous compound of which acidity or the pH value is equal to or lower than 2 and of which alkalinity or the pH value is equal or higher than 12.5. Testing or analyzing methods are done by using pH-meter according to US EPA Method 9040.
- 2.2 Liquid solution which erodes steel SAE 1020 more than 6.35 mm (0.250 in) per year at the temperature of 55°C (130°F). Testing or analyzing methods are followed NACE (National Association of Corrosion Engineers) Standard TM-01-69.
- Section 3 Reactive substances, which have the following properties and characteristics.
- 3.1 The substance that is not stable reacts rapidly and violently but without explosion.
- 3.2 The substance that reacts explosively with water.
- 3.3 The substance that forms an explosive mixture when mixed with water.
- 3.4 The substance that generates toxic gases, vapors or fumes when mixed with water in an amount that may cause hazards to human health and environment.
- 3.5 The substance that is composed of cyanide or sulfide. When the acidity or pH values are between 2 to 11.5 then it generates toxic gases, vapors or fumes when mixed with water in an amount that may cause hazards to human health and environment.
- 3.6 The substance that explodes when heated in the limited volume or reacts explosively and rapidly and may cause explosion when exposed to the standard temperature and pressure (pressure at 1 atm and temperature at 0°C).
- Section 4 Toxic substances, which have the following properties and characteristics.
- 4.1 The substance that is hazardous to human health and causes lethality with small amount. Testing or analyzing methods are done by EPA toxicity test methods.
- 4.2 The substance of which toxicity is described as follows:
When rats were used in animal tests, LD50 (Oral LD50) is lower than 50 mg per kg-body weight or LC50 (Inhalation LC50) is lower than 100 ppm in the form of vapor or gas. When rabbits were used in animal tests, LD50 (Dermal Rabbit LD50) is lower than 43 mg per kg-body weight. Here LD50 means the average (amount) of medium lethal dosage that causes mortality in 50% of a group of animals. The unit of LD50 is mg of toxic substance per 1 kg of animal body weight. LC50 means the average (concentration) of medium lethal concentration that causes mortality in 50% of a group of animals. The unit of LC50 unit is part (by volume or by weight) of toxic substance per million parts of media (by volume of by weight).
- 4.3 The substance that is generated by production processes in which carcinogenic chemicals as listed in Group 1, Group 2A and Group 2B by International Agency for Research on Cancer were included or contaminated.
- 4.4 The substance that is toxic to aquatic (Aquatic LC50) lower than 5 mg/L in 96 hours.
- 4.5 The substance that is diluted lower than 20% in concentration but is still toxic as LC50 to aquatic in 96 hours.
- Section 5 Leachable substances that were extracted by the Leachate extraction procedures and leachate analysis as defined in Section 3 of the Appendix 2 in the end of this notification. The amount of heavy metal or the toxic substances in leachate are equal to or more than any of the following values.
- | | |
|----------------------|------------------------|
| Arsenic (total) | 5.0 milligram /liter |
| Barium | 100.0 milligram /liter |
| Benzene | 0.5 milligram /liter |
| Cadmium (total) | 1.0milligram /liter |
| Carbon tetrachloride | 0.5 milligram /liter |
| Chlordane | 0.03milligram /liter |
| Chlorobenzene | 100.0milligram /liter |
| Chloroform | 6.0milligram /liter |
| Chromium (total) | 5.0milligram /liter |
| ortho-Cresol | 200.0milligram /liter |

meta-Cresol	200.0milligram /liter
para-Cresol	200.0 milligram /liter
Cresol (total)	200.0 milligram /liter
2-4 D	10.0milligram /liter
1,4-Dichlorobenzene	7.5 milligram /liter
1,2-Dichloroethane	0.5 milligram /liter
1,1-Dichloroethylene	0.7milligram /liter
Endrin	0.02milligram /liter
Heptachlor and its epoxide	0.008milligram /liter
Hexachlorobenzene	0.13milligram /liter
Hexachlorobutadiene	0.5 milligram /liter
Hexachloroethane	3.0 milligram /liter
Lead (total)	5.0 milligram /liter
Lindane	0.4 milligram /liter
Mercury (total)	0.2 milligram /liter
Methoxychlor	10.0milligram /liter
Methyl ethyl ketone	200.0milligram /liter
Nitrobenzene	2.0milligram /liter
2,4-Nitrotoluene	0.13milligram /liter
Pentachlorophenol	100.0milligram /liter
Pyridine	5.0 milligram /liter
Selenium	1.0 milligram /liter
Silver	5.0 milligram /liter
Tetrachloroethylene	0.7 milligram /liter
Toxaphene	0.5 milligram /liter
Trichloroethylene	0.5 milligram /liter
2,4,5-Trichlorophenol	400.0 milligram /liter
2,4,6-Trichlorophenol	2.0milligram /liter
2,4,5-TP (Silvex)	1.0 milligram /liter
Vinyl chloride	0.2milligram /liter

Part 2

Waste or disused substances from non-specific sources and specific sources.

- Section 6 Waste or disused substances from non-specific sources which have the following properties and characteristics.
- 6.1 Spent halogenated solvents used in the degreasing processes such as tetrachloroethylene, trichloro ethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, chlorinated fluorocarbon. Including those mixtures with other solvents used in the degreasing processes. The mixture prior to use contained one or more types of the above mentioned chemicals in the concentration of 10% by volume or more. Also the still bottoms from the solvent recovery process of the mentioned mixture are included.
- 6.2 Spent halogenated solvents such as tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chloro benzene, 1,1,2-trichloro-1,2,2-trifluoroethane, Ortho-dichlorobenzene, trichlorofluoro methane, 1,1,2-trichloroethane. Including those mixtures with other solvents used in the degreasing processes. The mixture prior to use contained one or more types of the above mentioned chemicals in the concentration of 10% by volume or more. Also the still bottoms from the solvent recovery process of the mentioned mixture are included.
- 6.3 Spent non-halogenated solvents, group 1 such as xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutylketone, n-butyl alcohol, cyclo hexanone and methanol. Including those mixtures with other solvents used in the degreasing processes. The mixture prior to use contained one or more types of the above mentioned chemicals in the concentration of 10% by volume or more. Also the still bottoms from the solvent recovery process of the mentioned mixture are included.
- 6.4 Spent non-halogenated solvents, group 2 such as cresols, cresylic acid and nitrobenzene. Including those mixtures with other solvents used in the degreasing processes. The mixture

- prior to use contained one or more types of the above mentioned chemicals in the concentration of 10% by volume or more. Also the still bottoms from the solvent recovery process of the mentioned mixture are included.
- 6.5 Spent non-halogenated solvents, group 3 such as toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol and 2-nitropropane. Including those mixtures with other solvents used in the degreasing processes. The mixture prior to use contained one or more types of the above mentioned chemicals in the concentration of 10% by volume or more. Also the still bottoms from the solvent recovery process of the mentioned mixture are included.
- 6.6 Wastewater treatment sludges from electroplating operations, with the exception of those sludges from aluminium anodizing processes with sulfuric acid, steel plating processes with aluminium or zinc, cleaning/stripping solution from steel plating processes with tin, zinc and aluminium, and chemicals from aluminium etching and milling processes.
- 6.7 Used solution from cyanide plating bath in metal plating processes.
- 6.8 Sludge from metal plating bath in which cyanide is used in the plating process.
- 6.9 Cleaning/ stripping solution from metal plating processes in which cyanide is used.
- 6.10 Waste materials in quenching bath and oil bath from the metal heat treating operations in which cyanide is used in the process.
- 6.11 Used cyanide solution from salt bath pot cleaning in metal heat treating operations.
- 6.12 Sludge from wastewater treatment in the quenching process of metal heat treating operations in which cyanide is used.
- 6.13 Sludge from wastewater treatment in the aluminium chemical conversion coating with the exception of zirconium phosphating in aluminium can washing process.
- 6.14 Wastes from the production or industrial application of tri- or tetrachlorophenol or the intermediates used in the production of chloro-phenol derivatives used as reactants or chemical intermediate or components in the formulating processes. However wastes from the production processes of hexachlorophene, purified 2,4,5-trichloro phenol and wastewater and used carbon in the hydrogen chloride purification process are excluded.
- 6.15 Wastes from the production or industrial application of pentachloro phenol or intermediates as derivatives of pentachloro phenol used as reactant or chemical intermediate or component in the formulating process, except wastewater and used carbon in the purification of hydrogen chloride.
- 6.16 Wastes from the production and industrial application of Tetra-, penta-, or hexachlorobenzenes in the alkaline condition used as reactant or chemical intermediate or component on formulating process, except wastewater and used carbon in the purification of hydrogen chloride.
- 6.17 Wastes from the production of any substances or compounds by the equipment for producing tri- and tetrachlorophenols, provided that wastes from the specific equipment used for producing (or operating) hexachlorophene from purified 2,4,5-trichlorophenol are not included, except wastewater and used carbon in the purification of hydrogen chloride.
- 6.18 Wastes from the production process of chlorinated aliphatic hydrocarbons by free radical catalyzed including distillation residues of heavy ends and tars, wastes from washes of reactors in the production process of chlorinated aliphatic hydrocarbons by free radical catalyzed. The carbon chain in these chlorinated aliphatic hydrocarbons may be from 1 to 5 unrelated with the number or position of chlorine substitute, provided that wastewater, sludge from wastewater treatment and spent catalysts are not included.
- 6.19 Used Condensed light ends, filter aids and desiccant in the production process of chlorinated aliphatic hydrocarbons by free radical catalyzed. The carbon chain in these chlorinated aliphatic hydrocarbons may be from 1 to 5 unrelated with the number or position of chlorine substitute.
- 6.20 Wastes from the production of any substances or compounds by the equipment for producing tetra-, penta-, hexa-chlorobenzene in the alkaline condition used as reactant or chemical intermediate or component on formulating process, except wastewater and used carbon in the purification of hydrogen chloride.
- 6.21 Discarded unused formulations that contain the components of, or contain the components of compound from tri-, tetra-, or penta chlorophenol, provided that disused substances that contain the components of hexachlorophenol derived from the synthesis of purified 2,4,5-

- trichlorophenol are not included.
- 6.22 Residues from incineration or thermal treatment of contaminated soil with waste or disused substances as indicated in Section 6.14, Section 6.15, Section 6.16, Section 6.17, Section 6.20 and Section 6.21.
- 6.23 Wastewater and residues from wood preserving process including used preservative drippage and formulations generated in the plants using chlorophenolic except wastewater that is not contaminated with chemicals in the process.
- 6.24 Wastewater and residues from the preserving process by using creosote formulation including used preservative drippage and formulations, provided that sludge of wastewater treatment from the preserving process using creosote or pentachlorophenol is not included, except wastewater that is not contaminated with chemicals in the process.
- 6.25 Wastewater and residues from the preserving process by using inorganic preservatives which contain arsenic, chromium including used preservative drippage and formulations, provided that sludge of wastewater treatment from the preserving process using creosote or pentachlorophenol is not included, except wastewater that is not contaminated with chemicals in the process.
- 6.26 Primary sludge from petroleum refinery generated in the oil waste solid separation process including sludge of oil, water or solids from the gravitational separator during the storage or wastewater treatment or wastes from oil cooling, sludge generated in oil/water/solids separators in tanks and impoundments, in ditches, in conveyances, in sumps and in stormwater units both from the those accepted or unaccepted, dry weather flow, sludge generated by the separation of cooling water and oil contaminated cooling water, activated sludge from biological treatment including sludge from other units after the biological treatment.
- 6.27 Emulsified secondary sludge from petroleum refinery generated by the separation of oil/water/solids, including sludge or any float generated by physical or chemical separation of oil/water/solid in the wastewater treatment (including waste from cooling units). Sludge includes sludge and float generated in the induced air flotation, sludge in tanks and impoundments and sludge in dissolved air flotation process (DAF), sludge generated in stormwater unit both accepted or unaccepted, dry weather flow, sludge generated by the separation of cooling water and oil contaminated cooling water, activated sludge from biological treatment including sludge from other units after the biological treatment.
- Section 7 Hazardous wastes from specific sources which have the following properties and characteristics.
- 7.1 Waste substances from wood preservation such as: sludge from wastewater treatment in the preservative process using creosote or pentachloro phenol.
- 7.2 Waste substances from inorganic pigments manufacturing industries such as: sludge from wastewater treatment in the production process of chrome yellow and orange, molybdate orange, zinc yellow, chrome green, chrome oxide green both in anhydrous and hydrated forms, iron blue including residues from oven of chrome oxide green production process.
- 7.3 Waste substances from organic chemicals manufacturing industries such as:
- 7.3.1 Distillation bottoms generated in the production process of acetaldehyde from ethylene.
- 7.3.2 Distillation side cuts generated in the production process of acetaldehyde from ethylene.
- 7.3.3 Bottom stream from wastewater strippers in the production process of acrylonitrile.
- 7.3.4 Bottom stream from acrylonitrile column in the production process of acrylonitrile.
- 7.3.5 Bottoms from acrylonitrile purification column in the production process of acrylonitrile.
- 7.3.6 Still bottoms in the distillation of benzyl chloride.
- 7.3.7 Distillation residues or heavy ends in the production process of carbon tetrachloride.
- 7.3.8 Heavy ends or still bottoms) from purification column in the production process of epichlorohydrin.
- 7.3.9 Heavy ends from fractionation column in the production process of ethyl chloride.
- 7.3.10 Heavy ends from the distillation of ethylene dichloride in the production process of ethylene dichloride.
- 7.3.11 Heavy ends from the distillation of vinyl chloride in the production process of vinyl chloride monomers.
- 7.3.12 Antimony catalyst in the production process of fluoromethane.

- 7.3.13 Distillation bottom tars in the production process of phenol/acetone from cumene.
- 7.3.14 Distillation light ends in the production process of phthalic anhydride from naphthalene.
- 7.3.15 Distillation bottoms) from the production process of phthalic anhydride from naphthalene.
- 7.3.16 Distillation bottoms from the production process of nitrobenzene by the nitration of benzene.
- 7.3.17 Stripping still tails from the production process of methyl ethyl pyridine.
- 7.3.18 Waste substances from centrifugation) and distillation in the production process of toluene diisocyanate.
- 7.3.19 Spent catalyst from the hydrochlorinator in the production process of 1,1,1-trichloroethane.
- 7.3.20 Product stream stripper in the production process of 1,1, 1-trichloroethane.
- 7.3.21 Column bottoms or heavy ends in the production process of tichloroethylene and prchloroethylene.
- 7.3.22 Distillation bottoms in the production process of aniline.
- 7.3.23 Distillation bottoms or fractionation column bottoms in the production process of chlorobenzene.
- 7.3.24 Distillation light ends in the production process of phthalic anhydride from ortho-xylene.
- 7.3.25 Distillation bottoms in the production process of phthalic anhydride from ortho-xylene.
- 7.3.26 Distillation bottoms in the production process of 1, 1, 1-trichloroethane.
- 7.3.27 Heavy ends from heavy ends column in the production process of 1, 1, 1-trichloroethane.
- 7.3.28 Waste substances from the distillation of aniline in the production process of aniline.
- 7.3.29 Wastewater from the production process of nitrobenzene and aniline.
- 7.3.30 Waste water separated from the stage of reactor product washing) in the production process of chlorobenzene.
- 7.3.31 Column bottoms from the separation process in the production of 1, 1-dimethyl hydrazine or UDMH from carboxylic acid hydrazine.
- 7.3.32 Condensed column overheads from the production separation process and the condensed of vent gases from reactor in the production of 1, 1-dimethyl hydrazine or UDMH from carboxylic acid hydrazine.
- 7.3.33 Filter cartridges from the product purification process in the production of 1, 1-dimethyl hydrazine or UDMH from carboxylic acid hydrazine.
- 7.3.34 Condensed column overheads from the intermediates separation process in the production of 1, 1-dimethyl hydrazine or UDMH from carboxylic acid hydrazine.
- 7.3.35 Wastewater in the production process of dinitrotoluene by the nitration of toluene.
- 7.3.36 Wastewater as reaction by-product from drying column in the production process of toluenediamine by hydrogenation of dinitrotoluene.
- 7.3.37 Condensed liquid light ends in the purification of toluene diamine in the production process of toluenediamine by hydrogenation of dinitrotoluene.
- 7.3.38 Vicinals in the purification of toluene diamine in the production process of toluene diamine by hydrogenation of dinitrotoluene.
- 7.3.39 Heavy ends in the purification of toluene diamine in the production process of toluenediamine by hydrogenation of dinitrotoluene.
- 7.3.40 Organic condensate from solvent recovery column in the production process of toluene diisocyanate by phosphogenation of toluene diamine.
- 7.3.41 Wastewater from reactor vent gas scrubber in the production process of ethylene dibromide by bromination of ethene.
- 7.3.42 Used absorbent solids in the purification of ethylene dibromide for the production of ethylene dibromide by bromination of ethylene.
- 7.3.43 Still bottoms from the purification of ethylene dibromide for the production of ethylene dibromide by bromination of ethylene.
- 7.3.44 Distillation bottoms in the production process of alpha-/methyl-/ring-chlorinated toluene, benzoyl chlorides and other compounds containing these functional groups with the exception of still bottoms from the distillation of benzyl chloride.
- 7.3.45 Organic residuals from the spent chlorine gas and hydrochloric acid recovery in the production process of alpha-/methyl-/ring-chlorinated toluene, benzoyl chlorides and other compounds containing these functional groups with the exception of used carbon absorbent.
- 7.3.46 Sludge generated from wastewater treatment in the production process of alpha-/methyl-/ring-chlorinated toluene, benzoyl chlorides and other compounds containing these

- functional groups with the exception of sludges subjected to neutralization and biological sludge.
- 7.4 Waste from inorganic chemicals manufacture industries such as:
- 7.4.1 Brine purification muds from the production of chlorine by mercury cell, provided that separated brine prior to this process was not used.
- 7.4.2 Waste substances of chlorinated hydrocarbon from the purification process of chlorine by diaphragm cell.
- 7.4.3 Sludge of wastewater treatment from the production process of chlorine by mercury cell.
- 7.5 Waste substances from the production industries of plant or animal pesticides such as:
- 7.5.1 By-products of salts in the production process of MSMA and cacodylic acid.
- 7.5.2 Sludge of wastewater treatment in the production process of chlordane.
- 7.5.3 Wastewater and scrub) by the chlorination of cyclopentadiene in the production process of chlordane.
- 7.5.4 Filter solids from filtration of hexachlorocyclopentadiene in the production process of chlordane.
- 7.5.5 Sludge of wastewater treatment from the production process of creosote.
- 7.5.6 Still bottoms from the distillation of toluene for reuse in the production of disulfoton.
- 7.5.7 Sludge of wastewater treatment in the production process of disulfoton.
- 7.5.8 Cleaning/stripping from the production process of phorate.
- 7.5.9 Filter cake from the filtration of diethylphosphorodithioic acid in the production process of phorate.
- 7.5.10 Sludge of wastewater treatment in the production process of phorate.
- 7.5.11 Sludge of wastewater treatment in the production process of toxaphene.
- 7.5.12 Residues or heavy ends from the distillation of tetrachlorobenzene in the production of 2, 4, 5-T.
- 7.5.13 Residues of 2, 6-dichlorophenol in the production of 2, 4-D.
- 7.5.14 Wastewater from vacuum stripper in chlorinator of chlordane in the production of chlordane.
- 7.5.15 Wastewater that was not treated in the production process of toxaphene.
- 7.5.16 Wastewater that was not treated in the production process of 2, 4-D.
- 7.5.17 Wastewater, including salts, wash water, supermates and filtrates from the production process of ethylenebisdithio carbamic acid.
- 7.5.18 Wastewater from reactor vent scrubber in the production process of ethylenebisdithiocarbamic acid and salts.
- 7.5.19 Waste residues from filtration, evaporation and centrifugation in the production process of ethylenebisdithiocarbamic acid and salts.
- 7.5.20 Bag house dust and floor sweeping from the milling and packaging in the production or formulation process of ethylenebisdithiocarbamic acid and salts.
- 7.5.21 Wastewater from reactor and used sulfuric acid from acid dryer in the production process of methyl bromide.
- 7.5.22 Residues separated from wastewater and used absorbent in the production process of methyl bromide.
- 7.6 Waste substances from explosives manufacturing industries such as: sludges of wastewater treatment from the explosive production process, explosive contaminated carbon, sludges from the production, formulation or loading of initiating lead-based compounds and pink/red solution from the TNT preparation process.
- 7.7 Waste substances from petroleum refining industries such as: float from dissolved air flotation (DAF), slop oil emulsion, tank bottoms contaminated with zinc, sludge from API separator and sludge from heat exchanger bundle.
- 7.8 Waste substances from iron and steel industries such as: residues and dust from emission control in primary steel production by electric furnace and used solution for pickle from the steel finishing processes in each operation.
- 7.9 Waste substances from primary copper production industries such as: sludge and slurry blowdown from the thickening process in acid plant.
- 7.10 Waste substances from the primary lead production industries such as: residues from surface impoundment in each operation.
- 7.11 Waste substances from primary zinc production industries such as: sludge and slurry

- blowdown from acid plant.
- 7.12 Waste substances from primary aluminium production industries such as: used potliners.
- 7.13 Waste substances from secondary lead production industries such as: waste and dust from production process and used solution in leaching waste and dust from emission control with acid.
- 7.14 Waste substances from veterinary pharmaceuticals such as: sludge of wastewater treatment, residues from distillation tar, or aniline-based compounds and residues from the utilization of activated carbon in decolorization in the production process of arsenic or organo-arsenic.
- 7.15 Waste substances from the ink formulation industries such as: sludge, washes with caustic soda solvents or water from cleaning tubs and equipment in ink formulation process using pigments, driers, soaps and stabilizers in which chromium and lead are added as components.
- 7.16 Waste substances from coking industries such as:
- 7.16.1 Sludge of ammonia still lime from coking.
- 7.16.2 Tar sludges in decanter tank.
- 7.16.3 Residues from coal tar recovery process such as collecting sump residues in the production of cokes from coals or in the recovery of coke by-products.
- 7.16.4 Tar storage tank residues in the production of cokes from coals or in the recovery of coke by-products.
- 7.16.5 Residues from the recovery of light oil such as residues in stills, decanters and wash oil recovery units which is included in the recovery of coke by-products.
- 7.16.6 Residues in the wastewater sump from the distillation light oil including sludge from interception or contamination in the recovery of coke by-products.
- 7.16.7 Residues from naphthalene collection and recovery in the recovery of coke by-products.
- 7.16.8 Tar storage tank residues in the coal tar refining.
- 7.16.9 Coal tar distillation residues including still bottoms.
- 7.17 Waste substances from petrochemical industries such as residues of products contaminated with solvents, plastic residues from the incomplete polymerization or contaminated with solvents, sludge from wastewater treatment contaminated with solvents or plastic of incomplete polymerization and all kind of disused or used catalyst and intermediates.

Part 3

Waste or disused substances which have the properties and characteristics of disused or discarded or off-specification or waste chemicals in containers or any residues used for cleaning and contaminated with spilt chemicals.

Section 8 Acute hazardous chemicals as follows:

202 substances such as Aldrin (the other chemicals not listed here)

Section 9 Toxic hazardous chemicals as follows:

45 substances such as Acetaldehyde (the other chemicals not listed here)

Part 4

Waste or disused substances which have the properties and characteristics chemical wastes.

Section 10 Residues arising from industrial waste disposal operations.

Section 11 Wastes from the manufacture, formulation and use of wood preserving chemicals in industrial production processes.

Section 12 Wastes from the production, formulation and use of organic solvents in industrial production processes.

Section 13 Used lubricating oil.

Section 14 Waste mineral oils unfit for their originally intended use in which the content of petroleum oil is more than 70%.

Section 15 Waste oils/ water, hydrocarbons/ water mixture emulsions in industrial production processes.

Section 16 Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)

- Section 17 Waste tarry residues arising from refining, distillation, and any pyrolytic treatment.
- Section 18 Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish in industrial production processes.
- Section 19 Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives) in industrial production processes.
- Section 20 Wastes from production and formulation of photographic chemicals and processing substances.
- Section 21 Wastes resulting from surface treatment and plastics in industrial production processes.
- Section 22 Wastes having the following as constituents:
 - 22.1 Metal carbonyls
 - 22.2 Beryllium; beryllium compounds
 - 22.3 Hexavalent chromium compounds
 - 22.4 Copper compounds
 - 22.5 Zinc Compounds
 - 22.6 Arsenic; arsenic compounds
 - 22.7 Selenium; selenium compounds
 - 22.8 Cadmium; cadmium compounds
 - 22.9 Antimony; antimony compounds
 - 22.10 Tellurium; tellurium compounds
 - 22.11 Mercury; mercury compounds
 - 22.12 Thallium; thallium compounds
 - 22.13 Lead; lead compounds
 - 22.14 Inorganic fluorine compounds excluding calcium fluoride
 - 22.15 Organic or inorganic cyanides
 - 22.16 Acidic solutions or acids in solid form
 - 22.17 Basic solutions or base in solid form
 - 22.18 Asbestos (dust and fibres)
 - 22.19 Organic phosphorus compounds
 - 22.20 Phenols; phenol compounds including chlorophenols
 - 22.21 Ethers
 - 22.22 Halogenated organic solvents
 - 22.23 Organic solvents excluding halogenated solvents
 - 22.24 Any congener of polychlorinated dibenzo-furan
 - 22.25 Any congener of polychlorinated dibenzo -p-dioxin

Appendix 2

Standards and methods for detoxification, disposal, discharge or landfill of waste or disused substances, attached to Notification No.6, B.E. 2540

- Section 1 For detoxification, disposal, discharge or landfill of waste or disused substances as indicated in Appendix 1, a person engaging in a factory business shall take effect of either treatment or disposal or chain treatments as follows based on the characteristics and properties of the waste or disused substances with an approval from the Director of Department of Industrial Works or a person entrusted by the Director.
 - 1.1 Physical treatment such as follows:
 - 1.1.1 Centrifugation
 - 1.1.2 Steam distillation and Steam stripping
 - 1.1.3 Multi-media filtration
 - 1.1.4 Reverse osmosis, micro-/Ultra-filtration
 - 1.1.5 Evaporation
 - 1.1.6 Air flotation
 - 1.1.7 Gravity thickening
 - 1.1.8 Oil/water separator or coalescence separator
 - 1.2 Physical/chemical treatment such as follows:
 - 1.2.1 Soil washing
 - 1.2.2 Air stripping
 - 1.2.3 Activated carbon adsorption

- 1.2.4 Precipitation/Flocculation
 - 1.2.5 Dissolved air flotation
 - 1.2.6 Ion exchange
 - 1.2.7 Liquid/liquid extraction
 - 1.2.8 Filter press, dewatering, vacuum filtration and belt-press filtration
 - 1.3 Chemical treatment such as follows:
 - 1.3.1 Neutralizaion and pH adjustment
 - 1.3.2 Oxidation/reduction reactions
 - 1.3.3 Ozonation and UV/ozonation
 - 1.3.4 Electrodialysis
 - 1.3.5 Precipitation
 - 1.3.6 Dechlorination
 - 1.3.7 Dehalogenation
 - 1.4 Biological treatment such as follows:
 - 1.4.1 Attached film reactors
 - 1.4.2 Activated sludge
 - 1.4.3 Anaerobic digestion
 - 1.4.4 Composting
 - 1.4.5 Stabilization ponds
 - 1.4.6 In situ biological decomposition
 - 1.4.7 Biological detoxification
 - 1.5 Thermal processes for treatment and/or disposal such as follows:
 - 1.5.1 Wet-air oxidation
 - 1.5.2 Liquid injection incineration
 - 1.5.3 Cement kiln incineration and Rotary kiln incineration
 - 1.5.4 Fluidized bed incineration
 - 1.5.5 Solar evaporation
 - 1.6 Stabilization/fixation/solidification processes such as follows:
 - 1.6.1 Molten glass
 - 1.6.2 Chemical fixation
 - 1.6.3 Pozzolanic and cement based solidification
 - 1.6.4 Thermoplastic encapsulation
 - 1.6.5 Polymer encapsulation
 - 1.7 Land treatment and/or disposal such as follows:
 - 1.7.1 Land farming
 - 1.7.2 Spray irrigation
 - 1.7.3 Engineered, secured landfill
 - 1.7.4 Above ground long-term storage
 - 1.7.5 Deepwell injection
 - 1.8 A person engaging in a factory business can employ the other methods besides those indicated in Section 1.1 to Section 1.7 or other methods that can be verified that the treated results are equivalent or superior to the indicated methods for detoxification, dispose, discard or landfill of the waste or disused substances. Or the other methods that can reduce the waste or disused substances subjected to safety reuse and recycle such as solvent recovery, oil recovery. acid regeneration and metal recovery or that can be used as fuels blending for Co-incineration in industrial kilns/furnaces or wastes exchange for the application in production process as well as the employment of other parties' service activities in each operation.
- Section 2 Waste or disused substances that passed through the stabilization and solidification processed shall have the following properties.
- 2.1 The unconfined compressive strength tested by ASTM D-1633 and D-2166 shall not lower than 3.5 kg/cm². The treated waste or disused substance shall bear the load from upper when discarded in the secured landfill.
 - 2.2 The density shall not lower than 1.15 ton/m³.
 - 2.3 The concentration of the toxic substance in leachant or extraction fluid is corresponding to the leachate extraction procedure for the verification of the detoxification and completed

stabilization of the waste or disused substances as indicated in Section 3 prior to secured landfill.

- Section 3 Leachate extraction procedure and the analyzing method for the concentration of the hazardous leachant or extraction fluid are as follows:
- 3.1 Extraction for the quantitative analysis of leachable from waste and disused substance and testing whether the waste and disused substances have undergone the detoxification or stabilization completely by employing the following procedures.
- 3.1.1 If the sample of waste or disused substances is solution or the content of dry solids is lower than 0.5%, filter the solution with glass fiber filter of which pore diameter is around 0.6 to 0.8 micrometer, then analysis the filtrate by the method indicated in Section 3.2.
- 3.1.2 If the sample of waste or disused substances contains dry solids more than 0.5% then operate the following procedures.
- (1) Grind the sample of waste or disused substances into powder and then screen through the sieve of which pore diameter is 9.5 mm.
 - (2) To the 100 g sample obtained from (1), add leachant or synthetic acid rain extraction fluid comprised of distilled water and sulfuric acid and nitric acid (in the ratio of 80 to 20 by weight) until the pH of the mixture is constant at 5. Then adjust the volume of the mixture to make the ratio of leachant to sample weight equal to 20.
 - (3) Shake the mixture with a rotary agitator at the rotation rate of 30 rpm at 25°C for 18 hours.
 - (4) Filter the leachate with a fiber glass filter of which pore diameter is 0.6 to 0.8 micron.
 - (5) Analyze the filtrate as indicated in Section 3.2.
- 3.2 The analysis for toxic substances in filtrate from Section 3.1.1 or Section 3.1.2 follows the standard method US EPA SW 846 or the standard method indicated in Notification of Ministry of Industry Ref 2/2539, date 14 June B.E. 2539 for wastewater analysis. In the case the analysis of solution in leachate higher than standard as indicated in Section 5 Part 1 of the Appendix 1, it has to conduct the detoxification again to acquire the definite properties.

Attached to the Notification of Ministry of Industry No.6, B.E. 2540 (A.D. 1997)
(Format RO - GO9)

Report on the details of waste or disused substances

Date: Day, Month, Year

I (name) a person engaging in a factory business.
The office is located on the _____ Village _____ Side street
_____ Road _____ - _____ Tambon _____ District _____
Province _____ Telephone _____ FAX _____ factory
registration No. _____ . The factory is located on the _____
Village _____ Side street _____ Road _____ Tambon _____
District _____ Province _____ Telephone _____ FAX _____
_____. I would like to report the details of the waste or disused
substances as follows:

Section 1 The details of waste or disused substances and the
methods of disposal (indicated in the document serial No. 1)
Section 2 Layouts indicating sites of storage, detoxification,
disposal, discard, or landfill in outline (indicated in the document
serial No. 2)
Section 3 Transfer and transportation (indicated in the
document serial No. 3)
Section 4 Landfill and monitoring plans (indicated in the
document serial No. 4)
Section 5 Emergency response in the case of accident during
storage, detoxification, disposal, discard, or landfill (indicated in
the document serial No. 5)

Signature _____
a person engaging in factory business
()

(Document serial No.1)

The details of waste or disused substances and the methods of disposal

Order	As inicated in Appendix I		Names of waste or disused substances	Amount	Disposal	Remarks
	Part	Section				

Signature _____
a person engaging in factory business
()

Appendix 3
Current State of Environmental Practices of Japanese
Companies in Thailand and Other Asian Countries
(from the 1995 Research on Trends in Environmental Considerations
related to Overseas Activities of Japanese Companies)

1. Summary of the Survey

In order to assess the environmental practices of Japanese companies engaged in business in four Asian countries; the Philippines, Thailand, Indonesia and Malaysia, a survey consisting of a questionnaire and on-site interviews was conducted in 1995 with the cooperation of the respective local Japanese Chamber of Commerce and Industry. The questionnaire was distributed to all 2,070 companies (including non-manufacturers and small local offices) on the Japanese Chambers of Commerce and Industry's list of members for each of the four host countries (individual and nonprofit corporate members were excluded from the survey). Of these, 425 companies responded. (The return rate was 20.5%). For the survey in Thailand, the questionnaire was sent to 1,028 companies, of which 133 responded. The return rate was 12.9%.

The breakdown of the companies that responded by type of industry was: 69.2% by those in manufacturing (compared to 63.7% - the average of the other three Asian countries. Likewise, the figures in the parentheses hereafter show the average of the other three Asian countries.) and 25.6% (33.9%) by those in the non-manufacturing sector (construction, wholesale, finance, insurance, etc.). As for the number of employees, companies with less than 100 were 24.1% (34.6%), those with 100 through 500 were 33.8% (31.2%), and those with 1,000 or more were 19.5% (20.2%).

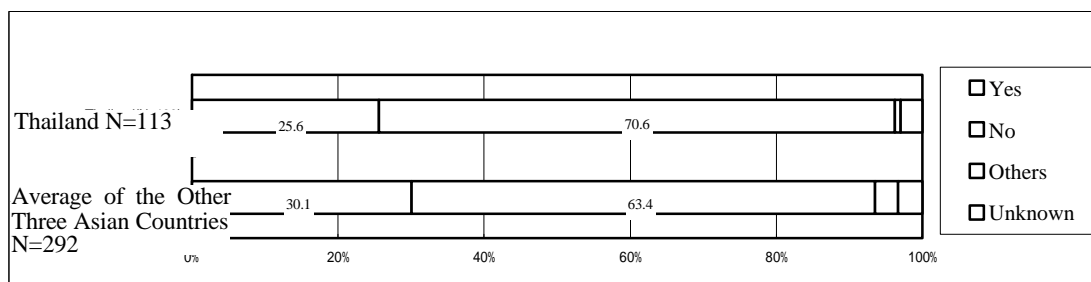
The current state of environmental practices of the Japanese companies in Thailand is summarized hereunder in comparison with the average of the other three Asian countries (292 returns).

2. Results of the Survey

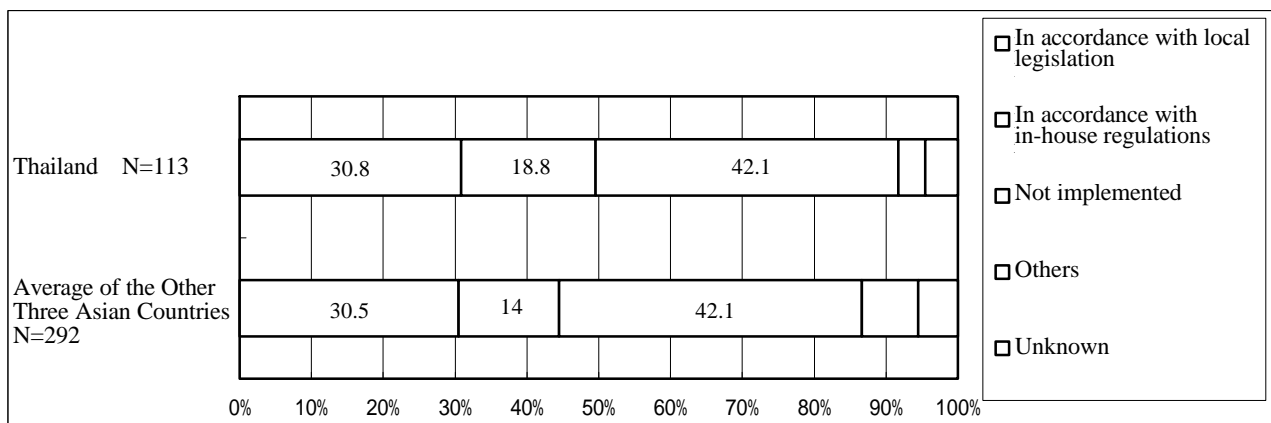
(1) Environmental considerations before establishing business overseas

In Thailand, the companies legally obliged to carry out environmental assessments accounted for 25.6% (30.1%) as shown in App3-Figure 1. However, the survey showed that, in fact, a far larger percentage of 49.6% (44.5%) of all companies that responded conducted environmental assessments (refer to App3-Figure 2). [30.8% (30.5%) did so in accordance with the local legislation of the host countries while 18.8% (14.0%) did so based on in-house regulations.]

App3-Figure 1 Was Environmental Assessment Legally Obligatory?



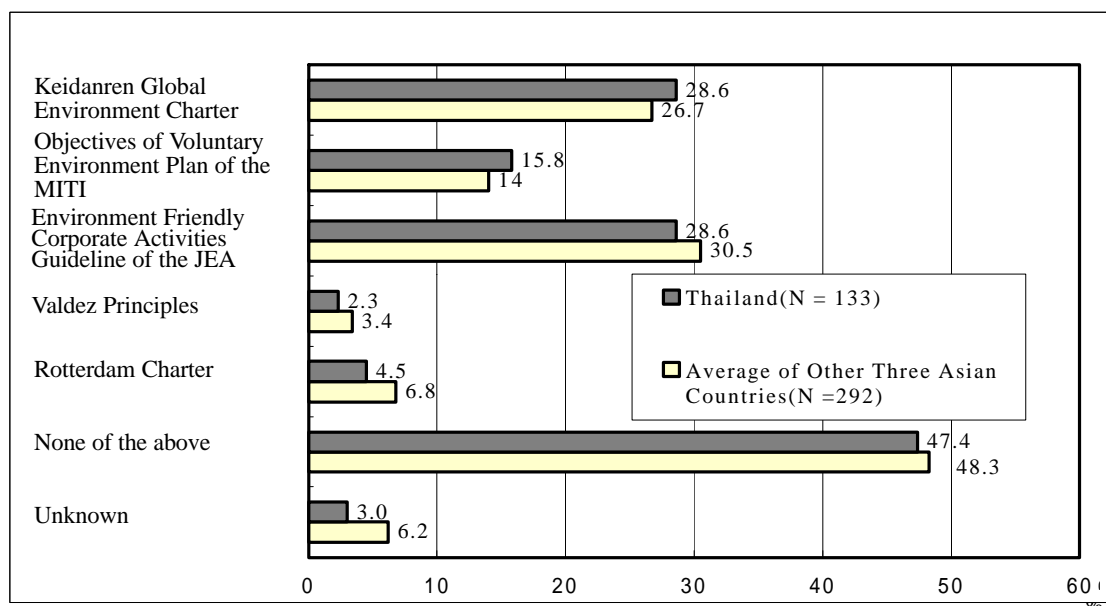
App3-Figure 2 Implementation of Environmental Assessment



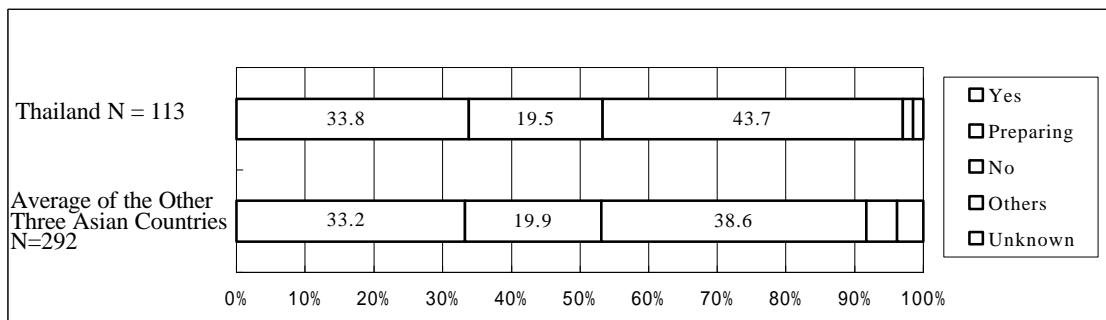
(2) In-house system and organization for promoting environmental measures

While 28.6% (30.5%) of the companies were acquainted with "Environment Friendly Corporate Activities Guideline" as published by the Japanese Environment Agency, 28.6% (26.7%) were aware of "Keidanren Global Environment Charter" by the Federation of Economic Organizations (Keidanren)(cf. App3-Figure 3, where multiple answers permitted). 53.3% (53.1%) had already established or were in the process of establishing corporate environmental policies (cf. App3-Figure 4). 52.6% (50.8%) said that they had some kind of section or personnel engaged in environmental management (cf. App3-Figure 5). [11.3% (11.0%) had a section exclusively designated for that purpose, 3.8% (4.5%) had exclusively designated staff, and 37.5% (35.3%) had staff assigned for environmental management with additional responsibilities.]

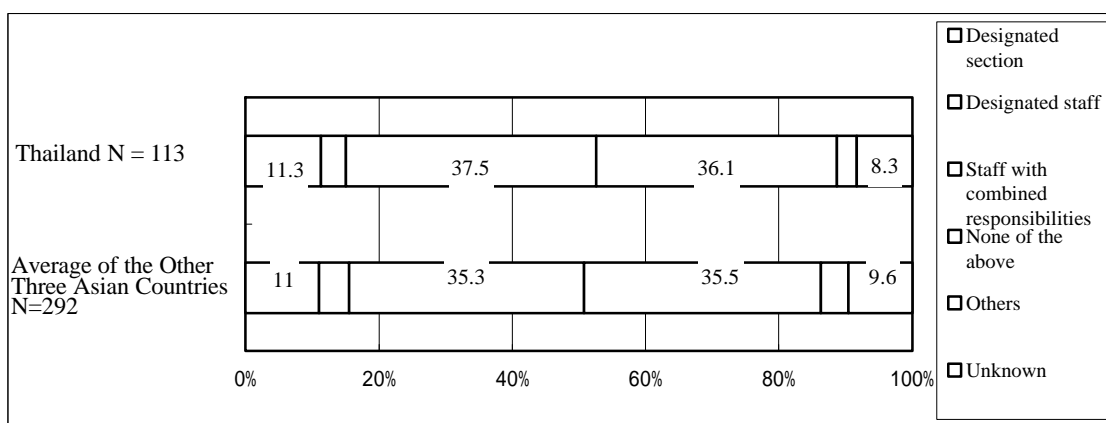
App3-Figure 3 Level of Awareness of Established Guidelines and Charters (Multiple answers permitted)



App3-Figure 4 Does Your Company Have Environmental Policies?



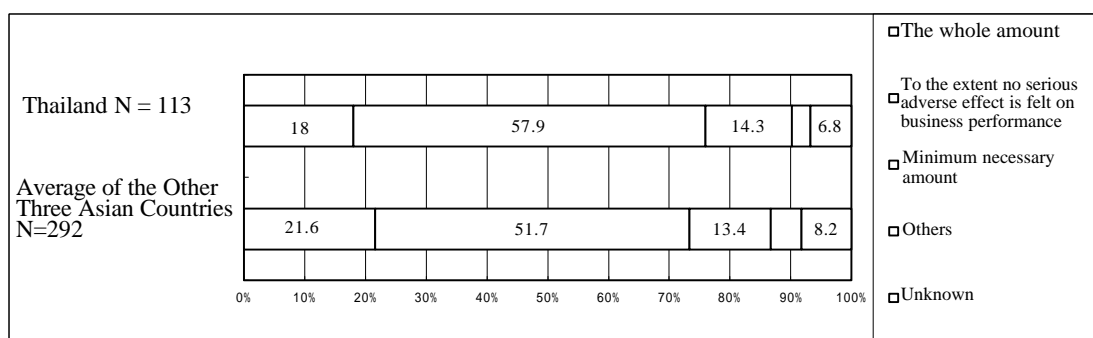
App3-Figure 5 Does Your Company Have Sections or Personnel Assigned to Environmental Management?



(3) Attitudes of companies toward environmental issues

Regarding the expenditures or investments for environmental conservation, 75.9% (73.3%) of those responded were willing to do more than the minimum requirements to satisfy the current regulations (cf. App3-Figure 6). [18.0% (21.6%) of these were willing to bear the necessary cost regardless of the company's business performance and 57.9% (51.7%) were willing to do so to the best of their ability so long as it had no serious effect on the business performance.]

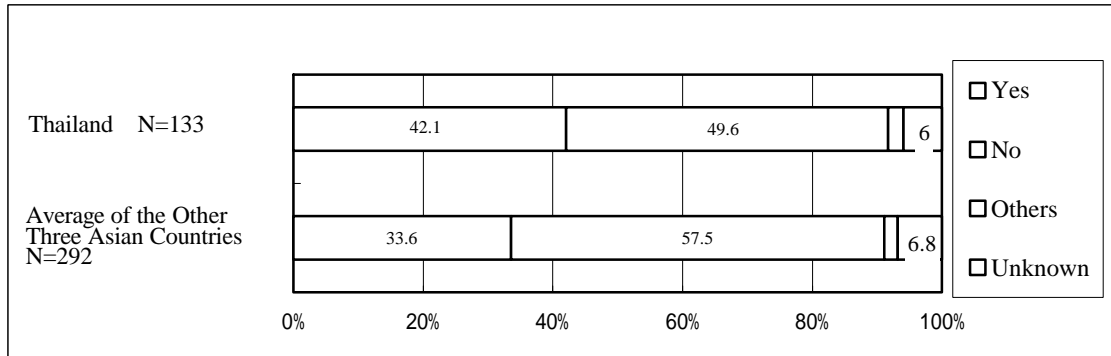
App3-Figure 6 Attitude toward Environmental Conservation in Relation to Expense



(4) Environmental issues surrounding operations in the host countries.

Of all those that responded, 42.1% (33.6%) were subject to the regulations of the local governmental bodies in terms of air and water pollution, etc. (cf. App3-Figure 7).

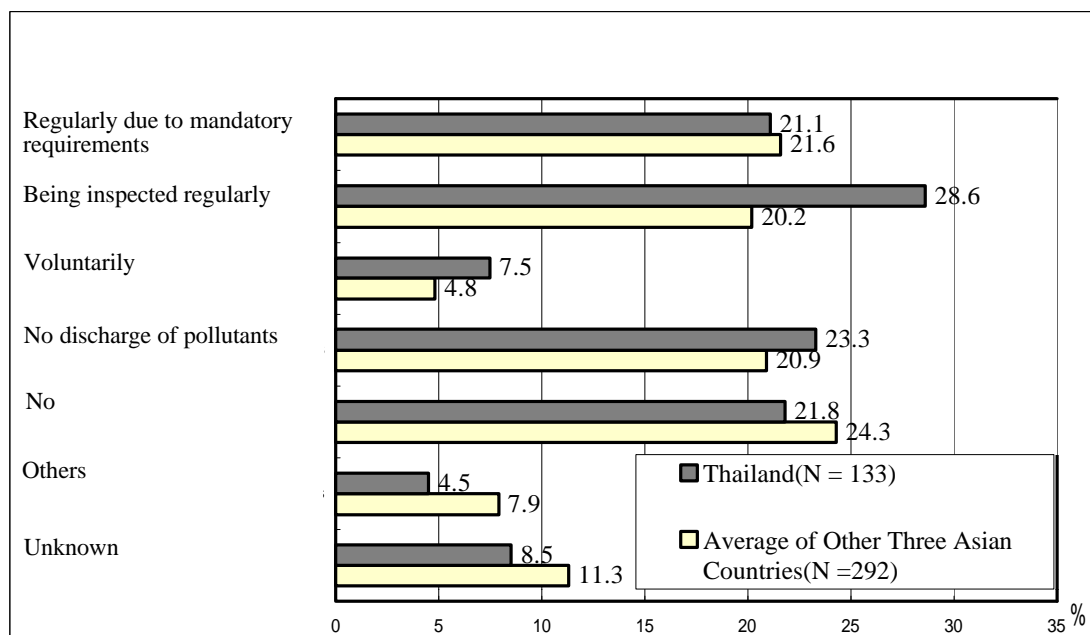
App3-Figure 7 Is Your Company Subject to Environmental Regulations?



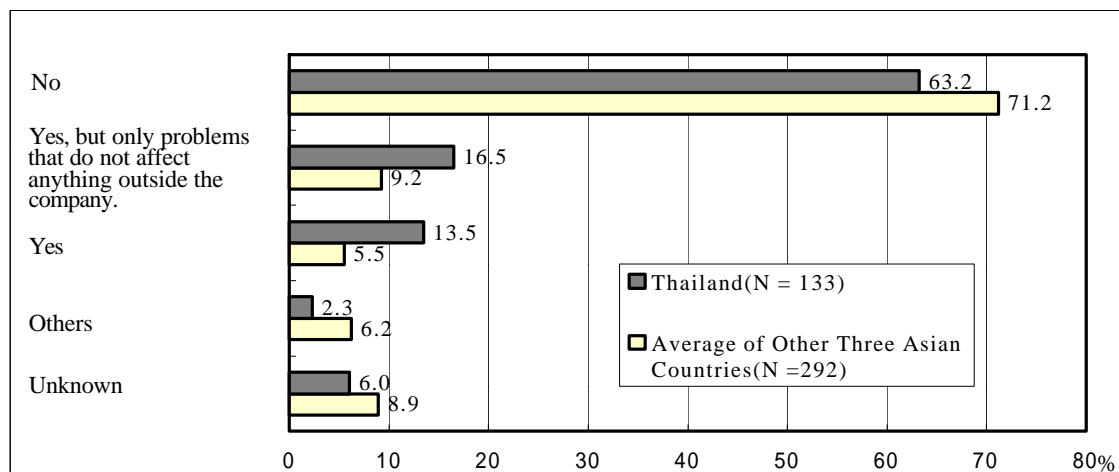
The questionnaire revealed that 28.6% (26.4%) reported the results of measurements of air and water pollution to the local authorities (cf. App3-Figure 8). [21.1% (21.6%) filed the reports on a regular basis because of mandatory requirements, while 7.5% (4.8%) reported on a voluntary basis. 28.6% (20.2%) were subject to mandatory periodic inspections.]

30.0% (14.7%) of the companies had encountered some environmental problems in the course of operation, including minor ones such as those with little or no significant effects outside the company premises (cf. App3-Figure 9).

App3-Figure 8 Does Your Company Report Measurement Results on Air and Water Quality? (multiple answers permitted)

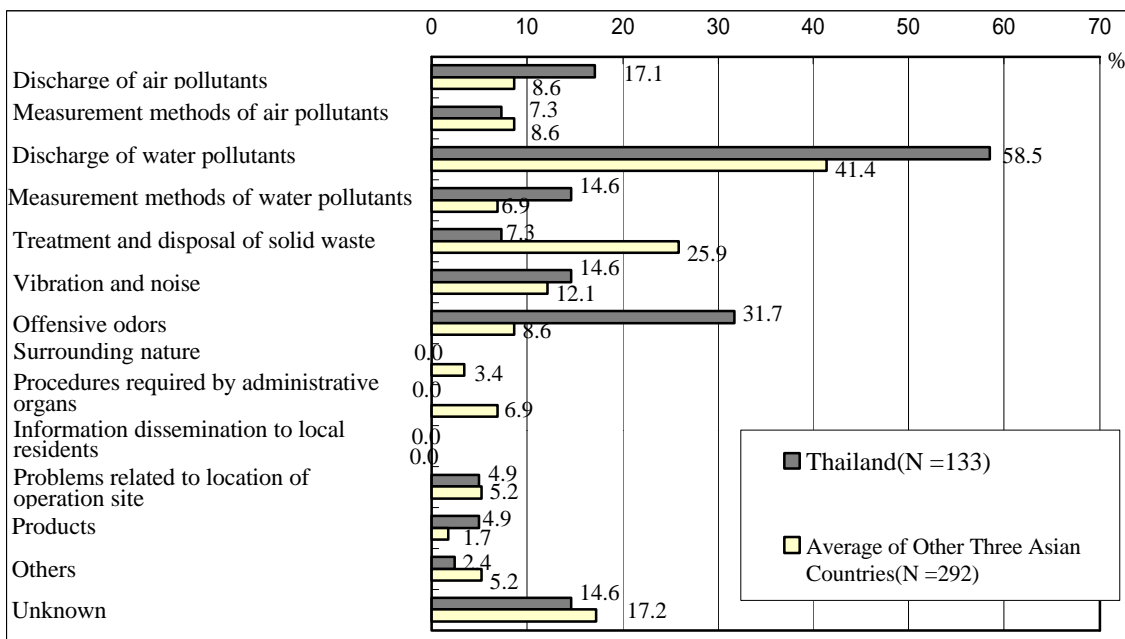


App3-Figure 9 Has Your Company Encountered any Environmental Problems and What Kinds of Problems ?



Among the environmental problems encountered, the issue related to discharge of pollutants into water showed the highest, accounting for 58.5% (41.4%), followed by issues related to odors accounting for 31.7% (8.6%), air pollutants 17.1% (8.6%), and vibration and noise 14.6% (12.1%). 14.6% (6.9%) had problems with measurement methods of water pollutants discharged into pollutants. Compared with the average of the other three Asian countries, Indonesia reported fewer problems with the treatment and disposal of the solid waste but reported higher figures for odor problems (cf. App3-Figure 10, where multiple answers permitted).

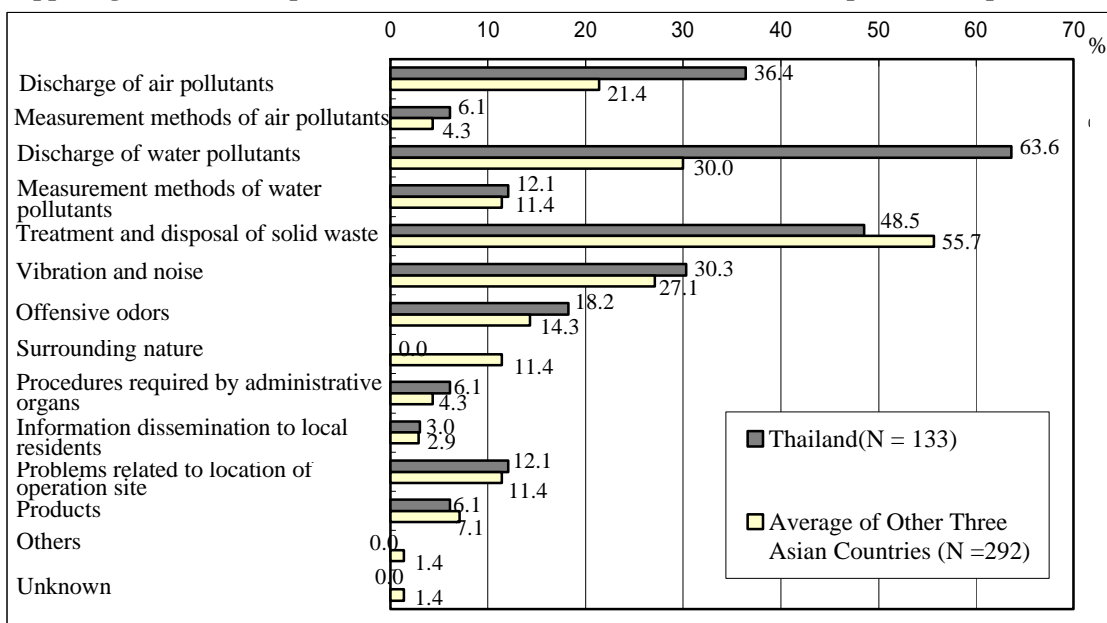
App3-Figure 10 Past Environmental Problems and Issues (multiple answers permitted)



According to the on-site interviews in all of the four Asian countries surveyed, the most advanced measures available in the host countries are employed in the treatment of waste water from the manufacturing operations; however some companies did not properly treat human daily waste water within the operation site. The on-site interviews also revealed that, some companies, unable to find proper disposal sites, kept the solid waste within the premises. This issue need to be tackled because it may lead to environmental problems in the future unless some appropriate measures are taken.

24.8% (24.0%) of the companies anticipate the possibility of some environmental problems arising. Among the issues anticipated, issues related to discharge of water pollutants reached 63.6% (30.0%), treatment and disposal of solid waste 48.5% (55.7%), and emission of air pollutants 36.4% (21.4%) (cf. App3-Figure 11, where multiple answers permitted).

App3-Figure 11 Anticipated Environmental Problems and Issues (multiple answers permitted)

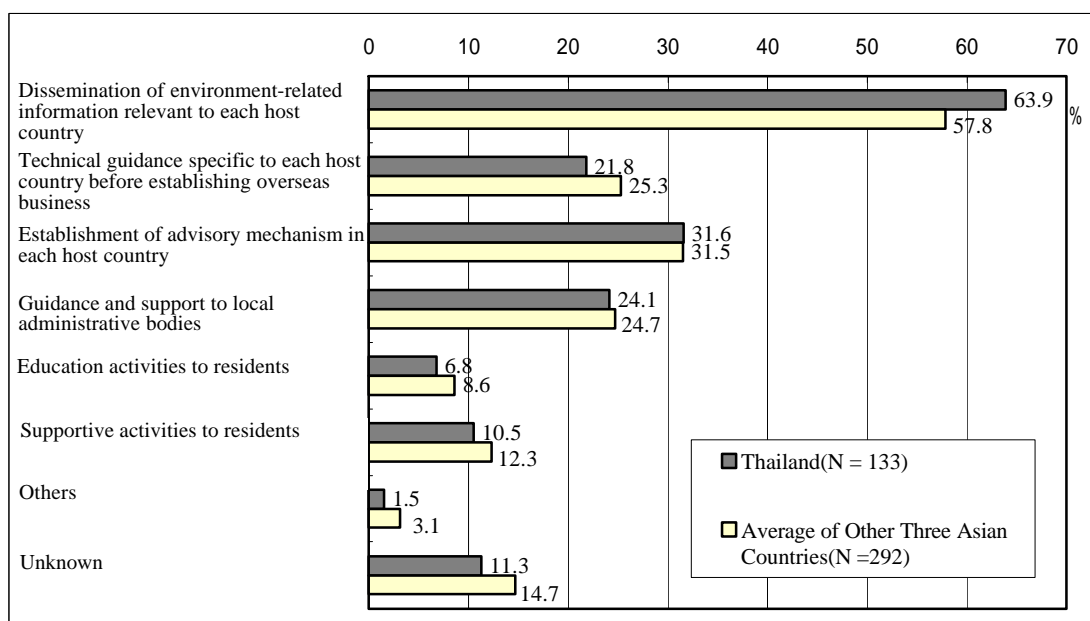


(5) Actions expected from the Japanese government

The questionnaire revealed that the Japanese government is expected to take the following actions for the furtherance of environmental measures by Japanese companies engaged in business operation overseas. Dissemination of environment-related information relevant to each host country (i.e. preparation of manuals); 63.9% (57.8%), establishment of an advisory mechanism in each host country; 31.6% (31.5%), provision of guidance and support and the acceptance of trainees by local administrative bodies of each host country for improvement of environmental and measurement technologies; 24.1% (24.7%), and provision of environmental technical guidance on measurement methods, for example, specific to each host country, in advance, to companies about to set up branches overseas; 21.8% (25.3%) (cf. App3-Figure 12, where multiple answers permitted).

Also during the on-site interviews, there were requests for the preparation of manuals summarizing environmental laws and regulations, and the current environmental problems and issues for each country. A compilation of the case studies about environmental measures from previous experiences of the companies already established there was also requested.

App3-Figure 12 What Do You Expect from the Japanese Government?



Appendix 4
Sources of Environmental Information
in Thailand and Japan

1. タイ / in Thailand

(1) タイ政府機関及びその他機関 / Thailand government agencies and other institutions

- 1) 科学技術環境省 / MOSTE: Ministry of Science, Technology and Environment
 - ・公害管理局水質管理部 / Water Quality Management Division, Pollution Control Department
404 Phahonyothin Center Bldg. Phahon Yothin Rd., Phayathai, Bangkok 10400, Thailand
phone+66-2-619-2299 ~ 2304
 - ・公害管理局大気・騒音管理部 / Air Quality and Noise Management Division, Pollution Control Department
404 Phahonyothin Center Bldg. Phahon Yothin Rd., Phayathai, Bangkok 10400, Thailand
phone+66-2-619-2214
 - ・公害管理局固形廃棄物・有害廃棄物管理部 / Hazardous Substance and Waste Management Division, Pollution Control Department
404 Phahonyothin Center Bldg. Phahon Yothin Rd., Phayathai, Bangkok 10400, Thailand
phone+66-2-619-2300 ~ 2305
 - ・環境政策・環境計画事務室環境影響評価部 / Environmental Impact Evaluation Division, Office of Environmental Policy and Planning
60/1 Soi Pibulwatana 7, Rama 6 Road, Bangkok 10400, Thailand
phone+66-2-279-7180 ~ 7189
 - ・環境研究研修センター / ERTC: Environmental Research and Training Center
Technopolis, Amphone Klong Luang, Pathumthani 12120, Thailand
phone+66-2-577-1136 ~ 1140
- 2) 工業省 / MOI: Ministry of Industry
 - ・工業局 / Department of Industrial Works, Ministry of Industry
75/6 Rama 6 Road, Rajthevee, Bangkok 10400, Thailand
phone+66-2-202-4000/202-3967
 - ・工業局有害物質管理部 / Hazardous Substances Control Bureau
75/6 Rama 6 Road, Rajthevee, Bangkok 10400, Thailand
phone+66-2-202-4227/202-4229
- 3) タイ投資委員会 / BOI: The Board of Investment
555 Vipawadee Rangsit Road, Chatuchak, Bangkok 10900, Thailand
Phone+66-2-537-8111
- 4) タイ工業団地公社 / IEAT: Industrial Estate Authority of Thailand
618 Thanon Nikhom Makkasan, Phayathai, Bangkok 10400, Thailand
phone +66-2-253-0561
- 5) バンコク都環境政策推進部 / Environmental Policy and Promotion Division, Bangkok Metropolitan Administration
173 Din Sor Road, Pra Nakorn District, Bangkok 10200, Thailand
phone+66-2-224-3059
- 6) タイ環境研究所 / TEI: Thailand Environment Institute
210 Sukhumvit 64, Refinery Buliding 4 Prakanong, Bangkok 10260, Thailand
phone +66-2-331-0060/331-0047

(2) 日本政府機関及びその他機関 / Japanese government agencies and other institutions

- 1) 在タイ日本国大使館 / Embassy of Japan in Bangkok
1674 New Petchburi Road, Bangkok 10320, Thailand
phone +66-2-252-6151 ~ 6159
fax +66-2-255-6999
- 2) 日本貿易振興会バンコクセンター / JETRO, Bangkok Center
JETRO Building., 159 Rajadamri Road, Lumpini, Bangkok 10330, Thailand
phone +66-2-253-6441 ~ 6445
- 3) 国際協力事業団タイ事務所 / JICA: Japan International Cooperation Agency, Thailand Office
1674/1 New Petchburi Road., Bangkok 10320, Thailand
phone +66-2-251-2735
- 4) 盤谷日本人商工会議所 / Japanese Chamber of Commerce, Bangkok
15th Floor, Amarin Tower, 500 Ploenchit Road. Bangkok 10330, Thailand
phone +66-2-256-9170 ~ 9173
fax +66-2-256-9621
- 5) 海外経済協力基金 / OECF: Overseas Economic Cooperation Fund
17th Floor, Thai Farmer Bank Building 400, Phaholyothin Road, Bangkok 10400, Thailand
phone +66-2-270-1001 ~ 1003
- 6) 国際交流基金バンコク日本文化センター / Japan Foundation, Japan Cultural Center, Bangkok
10th Floor, Serm-mit Building, 159 Sukhumvit 21 Asoke Road, Bangkok 10110, Thailand
phone +66-2-261-7500 ~ 7504

2. 日本 / in Japan

(1) 日本政府及びその他日本機関 / Japanese government agencies and other institutions

- 1) 環境庁企画調整局地球環境部環境協力室 / Office of Overseas Environmental Cooperation, Global Environment Department, Environment Agency
〒100-0013 東京都千代田区霞が関 1-2-2
1-2-2 Kazumigaseki, Chiyoda-ku Tokyo 100-0013 Japan
phone(03)3581-3351(代)
fax(03) 3581-3423
- 2) 日本貿易振興会(ジェトロ) / JETRO
〒105-0001 東京都港区虎ノ門 2-2-5
2-2-5 Toranomom, Minato-ku Tokyo 105-0001 Japan
phone(03) 3582-5522(広報課 / PR Division)
- 3) 海外経済協力基金 / Overseas Economic Cooperation Fund
〒100-0004 東京都千代田区大手町 1-4-1
1-4-1 Otemachi Chiyoda-ku Tokyo 100-0004 Japan
phone(03) 3215-1304

- 4) 日本輸出入銀行 / Export-Import Bank of Japan
〒100-0004 東京都千代田区大手町 1-4-1
1-4-1 Otemachi, Chiyoda-ku Tokyo 100-0004 Japan
phone(03)3287-9108
- 5) 国際協力事業団 / JICA; Japan International Cooperation Agency
〒151-0053 東京都渋谷区代々木 2-1-1 新宿マインズタワー
Shinjuku Maynds Tower Bldg., 1-1-2 Yoyogi, Shibuya-ku Tokyo 151-0053 Japan
phone(03) 5352-5311 ~ 4
- 6) 日本貿易振興会アジア経済研究所 / Institute of Developing Economies
〒162-0845 東京都新宿区市ヶ谷本村町 42
42 Ichigayahonmuracho, Shinjuku-ku Tokyo 162-0845 Japan
phone(03)3353-4231
- 7) 経済団体連合会 / Keidanren, Japan Federation of Economic Organizations
〒100-0004 東京都千代田区大手町 1-9-4
1-9-4 Otemachi, Chiyoda-ku Tokyo 100-0004 Japan
phone(03) 3279-1411
- 8) 日本商工会議所国際部中小企業国際化推進室 / International Division, Japan Chamber
of Commerce & Industry
〒100-0005 東京都千代田区丸の内 3-2-2
3-2-2 Marunouchi, Chiyoda-ku Tokyo 100-0005 Japan
phone(03)3283-7851
fax(03) 93216-6497
- 9) 東京商工会議所産業政策部 / Tokyo Chamber of Commerce and Industry
〒100-0005 東京都千代田区丸の内 3-2-2
3-2-2 Marunouchi, Chiyoda-ku Tokyo 100-0005 Japan
phone(03)3283-7657
fax(03) 3283-7633
- 10) 大阪商工会議所国際部 / International Division, Osaka Chamber of Commerce and
Industry
〒540-0029 大阪府中央区本町橋 2-8
2-8, Hommachibashi, Chuo-ku Osaka, 540-0029 Japan
phone(06)6944-6405
fax(06) 6944-6409

(2) タイ政府機関 / Thailand government agencies

- 1) 在日タイ王国大使館経済・投資部 / Embassy of Thailand, Division of Economy &
Investment
〒107-0052 東京都港区 2-11-3 福田ビル・ウエスト 8 階
8th Floor Fukuda Building West, 2-11-3, Akasaka Minato-ku Tokyo Japan
phone(03) 3582-1806
fax(03) 3589-5176