

Ministerial Decree No. KP.4/UM.501/PHB-90

Decree of the Minister of Transport

Number: KP.4/UM.501/PHB-90 1990

Technical Guidelines for the Analysis of Impacts upon the Environment in the Ports Sector

Minister of Transport

Regarding Technical Guidelines for Preparation of Environmental Information Reports, Environmental Impact Analyses, Environmental Evaluation Reports and Environmental Evaluation Studies in the Ports Sector

Minister of Transport

Considering:

a. that in the framework of implementing the Government Regulation Number 29 of 1986 regarding the Analysis of Impacts Upon the Environment, it is necessary to enact a Decree of the Minister of Transport regarding the Technical Guidelines for Producing the Environmental Information Reports, Environmental Impact Analyses, Environmental Evaluation Reports and Environmental Evaluation Reports and Environmental Evaluation Studies for Activities in the Ports Sector.

Adhering to:

1. Act Number 4 of 1982 regarding the Basic Provisions for Environmental Management (State Gazette Number 12, State Gazette Supplement 3215);
2. Government Regulation Number 29 of 1986 regarding the Analysis of Impacts upon the Environment (State Gazette Number 42 of 1986, State Gazette Supplement Number 3338);
3. Presidential Decree Number 44 of 1974 regarding the Bases of Organization of Departments;
4. Presidential Decree Number 15 of 1974 regarding the Organizational Structure of Departments as most recently amended by Presidential Decree Number 16 of 1989;
5. Decree of the Minister of Transport Number KM.91/OT.002/Phb-80, KM.164/OT.002/Phb-80, regarding the Organization and Working Procedures of the Department of Transport, as most recently amended by the Decree of the Minister of Transport No.KM.23 of 1989;
6. Decree of the State Minister for Population and Environment Number KEP.50/MENKLH/6/1987 regarding Guidelines for Preparation of Analyses of Impacts upon the Environment;
7. Decree of the Minister of Transport Number KP.41/HK.601/Phb-88 regarding the Establishment of the Central Commission for the Analysis of Impacts upon the Environment in the Field of Transport;

Hereby Decrees:

Enacting:

Decree of the Minister of Transport regarding Technical Guidelines for Preparation of Environmental Information Reports, Environmental Impact Analyses, Environmental Evaluation Reports and Environmental Evaluation Studies and Environmental Evaluation Studies for Activities in the Ports Sector.

First:

Preparation of Environmental Information Reports, Environmental Impact Analyses, Environmental Evaluation Reports and Environmental Evaluation Studies and Environmental Evaluation Studies for Activities in the Ports Sector shall be the responsibility of the Initiator and prepared in accordance with the Technical Guidelines for Preparation of Environmental Information Reports, Environmental Impact Analyses, Environmental Evaluation Reports and Environmental Evaluation Studies as referred to in annexes I.A, I.B, I.C, and I.D of this Decree.

Second:

This Decree shall become effective as from the date of its enactment.

Enacted in: Jakarta

On: March 19, 1990

Minister of Transport

[signed]

Ir. Azwar Anas

cc.:

1. State Minister for Population and Environment; 2. Secretary General of the Department of Transport; 3. Inspector General of the Department of Transport; 4. Director General of Marine Transportation; 5. Executive Director of Perum Pelabuhan I; 6. Executive Director of Perum Pelabuhan II; 7. Executive Director of Perum Pelabuhan III; 8. Executive Director of Perum Pelabuhan IV; 9. Heads of Provincial Offices of the Department of Transport; 10. Central Commission for AMDAL of Transport; 11. Head of Administrative Bureau of State Owned Companies.

Attachment I.A to Decree of the Minister of Transport

No.: KP.4/UM.501/PHB-90

Date: 19 March 1990

Technical Guidelines for Environmental Information Reports (PIL) for Planned Activities in the Ports Sector

Chapter I. Introduction

1. Identity of Initiator -- Name and full address of initiator of the planned port construction activities.

2. Identity of PIL preparer -- Name and full address of PIL preparer

Chapter II. Brief Description of Port Construction

1. Project Description

a. Type of Port

1) Commercial Ports;

2) Non-Commercial Ports;

3) Special Ports;

b. Location of the Port plus attached map with a scale of from 1:10,000 to 1:50,000.

c. Estimation of the planned construction period, economic life and technical life.

2. Outline Plan for Port Construction

a. Pre-Construction Phase

1) Schedule and details of planning activities;

2) Planning for land appropriation and compensation: schedule, use allocation location and land area;

3) Plans for relocation and distribution of residents;

4) Plans for the use of local workers for project activities.

b. Construction Period

1) Schedule of port construction, among others:

a) Roads and Bridges

(1) Top soil removal;

(2) Type of applied road construction including the prevention of land-slip from embankments and landslide prevention;

(3) Crossing mechanism of channels and location to be used;

(4) Method of transporting materials used;

(5) Use of heavy equipment.

b) Break Water:

- (1) Dredging the shipping lanes and harbor;
 - (2) Construction type of the applied break water;
 - (3) Reclamation of waters and shores;
 - (4) Change of pattern of currents during of break water construction;
 - (5) Use of heavy equipment.
- c) Warehouse for Hazardous Materials
- 1) Reclamation of waters and shore;
 - 2) Description of the types of hazardous and toxic materials being stored as well as description of estimated capacity.
- d) Dredging of shipping lanes/harbor:
- 1) Location, type, volume of the dredged sand/mud together with expected depth;
 - 2) Method of the applied dredging of sand/mud and prevention of landslide from the embankments;
 - 3) Method of transporting the sand/mud produced from dredging;
 - 4) Location and distance of disposal of sand/mud produced from dredging.
- e) Container Terminal
- (1) Top soil removal;
 - (2) Type of applied road construction;
 - (3) Dredging of waters or shore;
 - (4) Reclamation of waters or shore;
 - (5) Piling or construction of foundations on the shore for terminal's interest;
 - (6) Method of transport and location as well as distance of disposal of the sand/mud resulting from the dredging;
 - (7) Method of transport used, location and distance of temporary stockpiling of raw materials for construction such as stone, sand, etc.
- f) Removal of coral
- (1) Type, volume and location of coral;
 - (2) Methods of destruction or blasting of coral;

- (3) Type, category and explosive power;
- (4) Method of excavation and transporting the coral to the disposal site.

g) Construction of Deep Wells

- (1) Number, location and depth of the drilled wells;
- (2) Method of drilling used;
- (3) Amount, type of chemicals used in the drilling;
- (4) Method of transporting drilling equipment, required pipes and other materials to the drilling site;
- (5) Planned hourly production capacity of wells.

h) Reclamation activities:

- (1) Location and amount of materials (sand/mud) produced;
- (2) Method of excavation and transporting the materials to the site.

i) Piers:

- (1) Dredging of waters or shore;
- (2) Construction of foundation or pile as well as floor;
- (3) Reclamation activities of waters and shore.

j) Shifting the river flow:

- (1) Location, volume and method of excavation of soil from the new river flow region and method of transport to the filling site;
- (2) Reclamation and dredging of waters and shore.
- (3) Change of river flow patten during the construction period;
- (4) Slope weighting for soil retention.

k) Dry bulk loading and unloading facilities

- (1) Reclamation and dredging of waters and shore;
- (2) Type and volume of dry bulk to be loaded or unloaded;
- (3) Type of construction of loading and unloading facilities

l) Liquid Bulk Storage (Tank Farm)

- (1) Amount and capacity of each liquid bulk tank;
- (2) Method of manufacturing the liquid bulk tank;
- (3) Method of transporting the raw materials, equipment and materials required.

m) Industry in the Port Working Environment

- (1) Dredging and reclamation of waters or shore;
- (2) Type of construction for industrial buildings.
- (3) Channels for rain water and waste;
- (4) Method of transporting the raw materials, machinery and equipment used;
- (5) Construction of Base Camp and other facilities.

n) Docking and other ship facilities:

- (1) Dredging and reclamation of waters or shore;
- (2) Construction type of docking and ship facilities;
- (3) Method of transporting the materials, machinery and equipment.

o) Passenger Terminal:

- (1) Construction type of the passenger terminal facilities;
- (2) Method of transporting the materials and equipment used.

p) Power generators:

- (1) Type and number of power generators;
- (2) Capacity and power.

2) Area to be used for the harbor construction comprising the main and support facilities.

3) Type and capacity of equipment being used;

4) Main construction materials:

a) Type and amounts;

b) Place and method of delivery;

c) Method of transport;

d) Location and distance of temporary stockpiling;

- e) Final disposal of unused materials.
- 5) Workers:
- a) Number, education, skill and status of the workers required.
 - b) Origin, age and sex of workers;
 - c) Accommodation for workers.
- c) Post-Construction Phase:
- 1) Systems and procedures for services for ships, goods, passengers etc. in the port.
 - 2) Facilities/equipment to be used;
 - 3) Capacity and type of production;
 - 4) Waste:
 - a) Types;
 - b) Amount or volume;
 - c) Management system.
 - 5) Workers:
 - a) Number, education, skill and status of the workers required.
 - b) Origin, age and sex of workers;
 - c) Accommodation for workers.
3. Relationship with other activities:
- a) Distance of the planned port site from other activities, such as residential settlements, industry and others;
 - b) Other sources affected by the port project, such as the number of residents to be relocated, area for other usage affected by the port project, and so on.
 - c) Other projects located in the vicinity of the port project as well as their relationship;
 - d) Estimation of effects of the planned port on the socio cultural and socio economic aspects as well as the security and prosperity of the surrounding community;
 - e) Plans for the relocation of residents affected by the impacts and compensation system to be used.

Chapter III. Brief Description of the Initial Environmental Characteristics

1. Climate

- a. Type of climate;
- b. Temperature (maximum/minimum);
- c. Rainfall and number of rainy days;
- d. Wind conditions (direction and velocity according to the season);
- e. Air quality and noise;
- f. Humidity.

2. Physiography and Geology:

- a. Morphology;
- b. Topography/hydrography;
- c. Geological Structure

3. Hydrology:

- a. Physical characteristics of rivers, sea, swamp (tide, fresh water);
- b. Quantity (maximum/minimum debit) and quality of river water, of sea water including the temperature and content of elements;
- c. Area of the river flow region;
- d. Sources of drinking, bathing and washing water (quality and quantity);
- e. Surface water absorption region and ground water conditions (depth, debit and quality);
- f. Other water usage such as industry, agriculture and so on.

4. Hydrooceanography: Marine hydrodynamic pattern including:

- a. Currents, waves and tides;
- b. Sedimentation and abrasion;
- c. Quality of water among others physical, microbiological and radioactive.

5. Space, soil and land:

- a. Type of soil;
- b. Structure and texture of soil;
- c. Stability and suitability of soil;

d. Layout and use of land;

e. Land use allocation.

6. Biology

a. Flora:

1) Type of flora having economic and aesthetic value both on land and in water, including the variety and similarity indexes;

2) Type of flora protected both on land and water.

b. Fauna:

1) Type of fauna having economic and aesthetic value both on land and water, comprising the population and variety index;

2) Type of fauna protected both on land and water.

7. Social Economy and Social Culture

a. Social Economy:

1) Available transport facilities and infrastructure;

2) Income and means of livelihood of the surrounding community;

3) Job and trading opportunities;

4) Mobility.

b. Social Culture

1) Population

a) Number of residents by age and sex;

b) Education;

c) Religion;

d) Health;

e) Security.

2) Attitude and perception of community towards the port construction;

3) Social cultural conditions and inheritances:

a) Physical;

- b) Non-Physical.
- 4) Other matters considered necessary.

Chapter IV. Environmental Impact Evaluation and Handling

1. Estimation of Impacts

Estimation of impacts upon the factors of climate, physiography and geology, hydrology, space and land, biology, social economy, and social culture of the community in the vicinity during the pre-construction, construction and postconstruction phases.

2. Evaluation of Impacts

Evaluation of the magnitude of environmental impacts shall be defined in accordance with:

- a. Number of population affected by the impacts;
- b. Area of impact distribution;
- c. Duration of impacts;
- d. Intensity of impacts;
- e. Number of other environmental components affected by the impacts;
- f. Cumulative character of impacts;
- g. Reversibility or irreversibility of impacts;

3. Handling

- a. Handling disturbance to ecological balance, human interest and environmental pollution during pre-construction, construction and post-construction;
- b. Workers released after pre-construction, construction, post-construction.

Chapter V. Bibliography

In this chapter, sources of data and other information should be stated which have been used such as books, magazines, papers, articles, and other media organized as follows:

1. Name of author or name of editor, either the name of a person or institution.
2. Year of publication of book, magazine, paper, article, and other media.
3. Publisher of book, magazine, paper, article, and other media.
4. Place of publication of book, magazine, paper, article, and other media.

Chapter VI. Attachments

The attached materials should be mentioned in this chapter.

1. Approval Letter of the Central Commission for AMDALHUB/Regional Commission or recommendations obtained by the Initiator up to the time at which the Environmental Impact Analysis (ANDAL) is prepared.
2. Letters of recognition, decision, qualification, reference for the implementing persons and researchers as well as the preparer of Environmental Impact Analysis (ANDAL).
3. Pictures (black and white or color) which can illustrate the environmental characteristics or proposed activities thus providing a deeper insight into the mutual relationships as well as the significant impacts which may result.
4. Diagrams, maps, figures, graphics, and tables which can support descriptions stating their sources, if they are truly cited or taken from certain bibliographical materials.
5. Other matters deemed necessary or relevant to be included in these attachments.

Chapter VII. Biodata of the PIL Preparer

The PIL Preparer must have expertise in the required discipline of knowledge and possess the basic qualification of AMDAL A or B.

Minister of Transport

Ir. Azwar Anas

Attachment I.B to Decree of the Minister of Transport

Number: KP.4/UM.501/PHB-90

Date: March 19, 1990

Technical Guidelines for Environmental Impact Analysis (ANDAL) Ports Sector Summary

The summary of ANDAL should be prepared so as to:

1. State directly the important inputs useful for decision making and management of the type of activity for the repair of environmental management.
2. Be understood by all parties including the community and easily summarized for placement in the mass media if deemed necessary.
3. Contain brief descriptions of:
 - a. Type of activities to be carried out with various significant impacts which occur as well as various efforts which are being and will be conducted by the responsible person and other party concerned to handle the significant impacts either on the pre-construction, construction and or post-construction phases.
 - b. Environmental management and monitoring which have been and will be conducted by the responsible person and other party concerned with handling significant impacts which emerge or may emerge due to the type of activity in question;

- c. Information regarding possible discrepancies in data, information, as well as various inadequacies and limitations, which will be faced during the implementation of the Environmental Impact Analysis (ANDAL);
- d. Other matters deemed highly necessary to complete this summary.

Chapter I. Introduction

The Introduction Chapter shall comprise:

1. Background

Brief description regarding the background to the implementation of ANDAL for the planned port construction and development activities/project viewed from:

- a. Applicable regulations and guidelines at either the Central or Regional level and environmental Quality Standards which must be applied as the reference for the planned activities/project.
- b. The bases of environmental management policies of all related institutions, either at Central or Regional level.
- c. Relationship of the planned port construction or development activities/project with the resulting significant impacts.

2. Objectives of Study

a. Purposes and objectives

Purposes and objectives of the ANDAL of the planned port construction or development activities/project are:

- 1) To identify the planned port construction or development activities/project particularly those resulting significant impacts upon the environment;
- 2) To identify the initial environmental characteristics, particularly those affected by the significant impacts at the site of the planned activities, inside and in the vicinity of the port's working environment;
- 3) To estimate and evaluate the significant impacts upon the environment both positive and negative, at the site of the planned activities, inside and in the vicinity of the port's working environment;
- 4) To provide advice for the environmental management and monitoring at the site of the planned activities, inside and in the vicinity of the port's working environment;

b. Benefits

The benefit of the ANDAL is to assist in the process of decision making, environmental planning and management of the planned port construction or development activities/project at the site of the planned activities/project, inside and in the vicinity of the port's working environment.

3. Scope of Study

Scope of study of ANDAL shall be determined by 2 (two) factors:

A. Regional boundaries which must be covered in the study are:

- 1) Planned activity boundaries;
- 2) Administrative boundaries;
- 3) Ecological boundaries;
- 4) Technical boundaries.

b. Environmental aspects which must be investigated in the ANDAL of the planned port construction or development activities/project, are. biological, geological, physical chemical, social economic and cultural aspects (Biogeofisik Sosekbud).

4. Methodology

Description of methodology required for the ANDAL of the planned port construction or development activities/project:

- a. Method and techniques for collection and measurement of initial environmental characteristics data;
- b. Method of analysis and evaluation of initial environmental characteristics data;
- c. Method for identification, estimation and evaluation of significant impacts.

Chapter II. Planned Port Construction or Development Activities/Project

1. Purpose and Objectives

Description of the purposes and objectives which includes:

a) Clear identification of Initiator, namely:

- 1) Name and complete address of the institution/company as the initiator of planned port construction or development activities/project;
- 2) Name and complete address of the responsible person for the implementation of the planned port construction or development activities/project.

b) Identity of ANDAL Preparer, including:

- 1) Name and complete address of the institution/company together with qualifications and references;
- 2) Name and complete address of the responsible person for the ANDAL preparation.

c) Clear Statement of Purpose and Objectives

Purpose and objectives of the planned port construction or development activities/project must be stated in systematic and concise way, coming directly to the point.

While the types of planned activities contained in the understanding of the planned port construction or development activities/project may constitute one of, a part or all of the following activities both on land and on water of the port's working environment, including:

- 1) Land appropriation and clearance in the port's working environment;
- 2) Construction of roads and bridges, highways and railway lines in the port's working environment as well as other transport facilities;
- 3) Construction of the break water;
- 4) Construction of warehouse for hazardous and toxic materials;
- 5) Dredging of shipping lanes and harbor as well as mud removal;
- 6) Construction of container terminal;
- 7) Construction of Passenger Terminal;
- 8) Destruction of rocks;
- 9) Construction of deep wells;
- 10) Reclamation activities;
- 11) Pier construction;
- 12) Shifting the river flow;
- 13) Construction of dry bulk loading/unloading facilities in the port's working environment;
- 14) Construction of site for unloading/loading of liquid bulk (tank farm) in the port's working environment;
- 15) Construction of Power Generator in the port's working environment;
- 16) Construction of factories (plants) in the port's working environment;
- 17) Construction of docking and ship facilities in the port's working environment;
- 18) Construction of ship waste water and other waste disposal facilities for the type of the proposed construction;
- 19) Location of stone quarry;
- 20) Other planned activities potentially resulting in significant impacts in the port's working environment and its surroundings.

2. Use, Needs and Alternatives

Description containing considerations of:

- a. Use and necessity for the planned port construction or development activities/project to be carried out, either viewed in terms of the interests of Initiator or in terms of support of regional construction and development programs.
- b. Precise location where the planned port construction and development activities/project will be carried out in the port's working environment.
- c. When these planned port construction and development activities/project will be carried out and its construction is completed to fulfill the expected use and necessity.
- d. Alternative Implementation Activities

If there are several alternatives for the implementation of the corresponding planned activities, then all the alternatives must be presented with their strengths and weaknesses, in terms of economic aspects, social cultural aspects and environmental conservation of each alternative.

In presenting these alternatives, equal/similar factors should be first studied for various alternatives, then the differences between alternatives.

3. Planned Activities and their Activity Components

Description in regards of:

- a. Determination of land boundaries which will be used directly by the planned activities must be shown on a maps with a scale of from 1:500 to 1:5,000 and which shows the interrelatedness and layout of the site of the planned port construction or development activities/project with other activities, such as natural settlement and environment located in the vicinity of the planned activities.

Archeological, historical remains and other sensitive regions located in or near the site of the planned port construction or development activities/project must be marked with a special symbol on the map;

- b. Relation and distance between the site of the planned port construction or development activities/project with the sources of building raw materials (stone, soil and sand) required for the planned activities. This relation should be shown on a map with an adequate scales (1:5,000);
- c. The site of the planned activities, other buildings and structures which will be built in the site of the planned activities as well as the relation of the said buildings and structures with the buildings existing in the surroundings (highways, railway tracks, piers, etc) shall be shown on a map of adequate scale (1:500). If other buildings and structures to be built turn out to deviate from the design standard, they should be clearly stated and the reasons should also be indicated why such deviations are necessary.
- d. Components of the planned activities which will result in the significant environmental problems, including:

- 1) Impacts of the port site on natural resources and environment, including:

- a) Breeding and spawning areas;
 - b) Fish catching areas;
 - c) Degradation of land and water in the vicinity including that for the residential community and other use allocations.
- 2) Impacts of the disposal of unused dredging waste:
- a) Fish production areas;
 - b) Fish catching areas;
 - c) Ecosystem in the sensitive sea (mangrove, coral reef, and seaweed);
 - d) Land use allocation;
 - e) Tourism/recreational areas.
- 3) Impacts of the oil contamination/diffusion in the harbor and which will come out from the harbor:
- a) Fish breeding and spawning areas/fish catching areas including estuaries and communal area;
 - b) Beaches, tourism and recreational areas;
 - c) Coastal communities;
 - d) Coastal forest and land ecosystem.
- 4) Impacts of the lack of unused water input in the harbor upon sanitation in the harbor.
- 5) Impacts of wastes upon the Hazardous and Toxic Materials on land to:
- a) Sanitation in the harbor;
 - b) Contamination of coastal resources outside the harbor:
 - 1) Coastal community;
 - 2) Beach, tourist and recreational area;
 - 3) **Fishery**;
 - 4) Coastal forests and land ecology.
 - c) Human safety and health.
- 6) Impacts of the lack of air controlling facilities for industry in the port area and its surroundings:

- a) Coastal Communities;
 - b) Beaches, tourism and recreational region.
- 7) Impacts of the improper management of toxic hazardous materials in the port area such as: exclusive dust, inflammable) and effects on:
- a) Contamination from the port wastes;
 - b) port security against fire, explosion and toxic impacts upon the port workers.
- 8) Impacts of inadequate management of vehicle traffic from and to the port upon:
- a) Local social economy;
 - b) Local air quality (from air contamination);
 - c) traffic safety.
- 9) Impacts upon the local social economy from:
- a) Inadequate residential availability (including slum areas);
 - b) Imperfect availability of water supply, drainage, and facilities for solid and liquid wastes and unsavory odors;
 - c) Relocation of agriculture;
 - d) Relocation of communities;
 - e) Change in land value.
- 10) Impacts upon the health of construction workers and community from the protection emerging during the construction (particularly malaria).
- 11) Impacts of excessive noise from the industry in the port on:
- a) Surrounding community;
 - b) Health and port workers.
- 12) Impacts of imperfect worker health training programs for the workers on their health safety from:
- a) Imperfect processing of sanitary waste;
 - b) Imperfect water supply (not guaranteed);
 - c) Inadequate preventive measures against leakage of toxic hazardous wastes including contamination and explosion;
 - d) Imperfect protection against excessive noise.

13) Impacts of inadequate measures in protecting the beach against the damage resulting from the change of coastal hydrology due to the implementation of the port because of:

a) Erosion;

ENFLEX Note: Paragraph b) was omitted from the original translation. The text will be revised upon receipt of the translation.

14) Impacts of inadequate measures to guarantee the safety of shipping entering and leaving the harbor, particularly those causing petroleum, oil and toxic hazardous material contamination;

15) Damage to sensitive regions such as natural or historical remains, cultural history of the community;

16) Other matters in specific situations.

4. Implementation phase of the planned port construction or development activities/project:

a) Pre-Construction/Preparatory Phase

1) Type of field survey activity, area to be surveyed and schedule of survey which has been carried out;

2) Plans for land appropriation/clearance, exploitation and method of control by observing the status of the land;

3) Plans for the relocation and distribution of residents affected by the project;

4) Plans for the use of local workers for project activities.

b) Construction Phase

1) Construction of Roads and Bridges, Highways and Rail Tracks in the Port's working environment.

-- Cutting of vegetation, land preparation, excavation or removal of top soil and rock layers in the area and its surroundings where roads will be constructed;

-- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, temporary bridges, cofferdams, construction for raising the heavy equipment and construction of other facilities;

-- Collection of building raw materials (stones, soil, sand, water, etc.);

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Filling activities or reclamation in the area of activity, including soil improvement, pre-loading or installation of sand drains to accelerate settlement;

-- Implementation of physical activities for the construction of roads and bridges in accordance with the applied construction method, including the construction of culverts, installation of piles, etc;

-- Implementation of road asphaltting activities;

-- Operation of heavy equipment required during the construction period;

(The followings should also be described: length and width of roads and bridges, method of construction applied, method of channel crossing, collection site and distance as well as method of transporting building raw materials, as well as the site for temporary stockpiling).

2) Construction of Break Water.

-- Cutting of vegetation and land preparation to make semipermanent buildings (workers huts) for temporary accommodation of workers, and other infrastructure, temporary bridges, cofferdams, construction for raising heavy equipment and construction of other facilities;

-- Collection of building raw materials (stones, soil, sand, water, etc.);

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Filling or reclamation activities (water, coast) as well as construction of the break water foundations, including land improvement;

-- Operation of heavy equipment or dredgers during the construction period;

-- Implementation of physical activities of construction of break water in accordance with the applied construction method, such as installation of stones, concrete walls, etc;

-- Change in the current circulation pattern during the break water construction period;

(The followings should also be described: length and width of break water, methods of the construction and collection of building raw materials applied, distance of collection as well as method of transporting the building raw materials, the site for temporary stockpiling).

3) Construction of Warehouse for Hazardous and Toxic Materials, Warehouse and Filling Yard.

-- Cutting of vegetation, land preparation, excavation or top soil removal and rocks layers in the area and its surroundings where the warehouse for hazardous and toxic materials will be constructed;

-- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and construction of other infrastructure;

-- Collection of building raw materials (stones, soil, sand, water, etc.) from the defined site;

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Reclamation or filling activities of water and coast;

-- Implementation of physical activities of the construction of the warehouse for hazardous and toxic materials in accordance with the applied construction methods, including the installation of piles, etc;

-- Operation of heavy equipment required during the construction period;

(The following should also be described: length and width and height as well as type of construction of the warehouse for the hazardous and toxic materials, description of the type and category as well as method of transporting the hazardous and toxic materials, method of transport and the collection site of building raw materials, as well as the site for temporary stockpiling).

4) Dredging Shipping Lanes and Harbor

-- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and other infrastructure;

-- Implementation of dredging of sand or mud at the site of activities to reach the expected depth;

-- Transport of the products of sand or mud dredging to the final disposal site;

-- Operation of dredger used;

(The followings should also be described: volume of dredging and the expected depth to reach, type of soil and sand dredged, method of dredging and type of dredger used, location of the products of dredging (coordinates));

5) Construction of Container Terminal

-- Cutting of vegetation, land preparation, excavation or top soil and rock removal in the area where the container terminal will be constructed;

-- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and construction of other infrastructure;

-- Collection of building raw materials (stones, soil, sand, water, etc.);

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Dredging activities of water or coast (harbor);

-- Activities of filling or reclamation in the site of activities, including land improvement, pre-loading or installation of sand drains to accelerate the settlement;

-- Implementation of physical activities of the construction of the container terminal in accordance with the applied construction methods, including the installation of piles, etc;

-- Operation of heavy equipment required during the construction period;

(The following should also be described: dimension and type of construction of the container terminal to be built, method of transport and method of collecting the building raw materials to be used as well as the site for temporary stockpiling).

6) Destruction of Rocks

- Land preparation and construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and construction of other infrastructure;
- Implementation of rock destruction or blasting activities applied, by observing the method of destruction applied and type of explosive used;
- Operation of heavy equipment or dredgers used during the construction period;
- Collection and transport as well as disposal of the blasted rocks to the defined disposal site, and cross section of the disposal site.

(The following should also be described: volume and type of the coral reefs to be blasted, method of destruction applied, type and power of the explosive materials used, disposal site for the blasted rocks).

7) Construction of Deep Wells

- Land preparation and construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and other infrastructure;
- Transport of pipe drilling equipment, equipment required and other materials to the drilling site;
- Technical installation and equipment used (pumps, etc.);
- Implementation of the drilling activities observing the method of drilling applied;
- Use of chemicals required or used in the drilling process (if any);

(The following should also be described: permits from the Director General of Geology and Mineral Resources: location/coordinates and number of wells to be drilled, estimation of capacity/volume and depth of wells).

8) Reclamation Activities

- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers and other infrastructure;
- Dredging of sand or mud in shipping lane, harbor or other site as collection materials;
- Transport of materials required (sand, mud) to the reclamation site;
- Implementation of physical activities of reclamation in accordance with the method applied;
- Operation of heavy equipment required during the construction period;

-- Operation of dredgers and tugboats or barges as well as trucks as a means for transporting the sand or mud.

(The following should also be described: volume of soil or sand required, type of soil or sand of reclamation materials, method of reclamation, method of transport and type of dredger used, collection site of sand or mud).

9) Construction of Piers

- Cutting of vegetation, land preparation, excavation or top soil removal and rock layers in the area where the pier will be built and environment;
- Construction of semi-permanent buildings (workers huts) for temporary accommodation of all workers and construction of other infrastructure;
- Dredging activities of coast or water carried out (if required);
- Collection of building raw materials (stones, soil, sand, water, etc);
- Transport of building raw materials from the collection site to the site of activities or temporary stockpiling site;
- Filling or reclamation activities in the activity location area;
- Construction of kistdam (temporary cofferdam);
- Implementation of physical activities of the construction of the pier in accordance with the applied construction method, including the construction of slope, installation of piles, etc;
- Operation of heavy equipment required during the construction period;

(The following should also be described: dimensions of pier to be built, location as well method of transporting the building raw materials applied as well as the method and type of pier construction).

10) Shifting of River Flow

- Land preparation to make semi-permanent buildings (workers huts) for temporary accommodation of workers, and other infrastructure;
- Cutting of vegetation and collection or excavation of soil and rock layers on the planned activity area
- sand/mud dredging activities for reclamation materials or filling (if required);
- Transport of the excavated materials and materials used (soil, sand) from the collection site to the filling site;
- Operation of heavy equipment, or dredgers during the construction period;
- Implementation of physical activities of reclamation and filling of materials on the planned activity area;

-- Shifting of river flow pattern or the occurrence of standing water during the construction period;

-- Activities of making land retaining banks (if required).

(The following should also be described: Collection site for raw materials or materials used, method of reclamation and excavation applied, method of transporting the raw materials, type of heavy equipment and dredgers used.

11) Construction of Dry Bulk Loading/Unloading Facilities in the Port's working environment

-- Cutting of vegetation, land preparation, excavation or top soil removal and rocks layers in the area where the dry bulk loading/unloading facilities will be constructed;

-- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and construction of other infrastructure;

-- Collection of building raw materials (stones, soil, sand, water, etc.);

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Filling or reclamation activities on the site of activities;

-- Implementation of physical activities of the construction of the dry bulk loading/unloading facilities in accordance with the applied construction method, including the installation of piles, drainage, etc;

-- Operation of heavy equipment required during the construction period;

-- Implementation of physical activities of technical installation and equipment used, such as plumbing, conveyors, power generation, etc.

(The following should also be described: Collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment to be used, type of dry bulk to be unloaded-loaded as well as loading/unloading capacity).

12) Construction of Facilities for Storage and Loading/Unloading of Liquid Bulk in the Port's working environment (Tank Farm)

-- Cutting of vegetation, land preparation and excavation or top soil or rock removal in the area where the facilities for the liquid bulk collection and loading/unloading are to be constructed;

-- construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and construction of other infrastructure;

-- Collection of building raw materials (stone, soil, sand, water, etc) and other materials required (steel plates, pipes, etc.) Transport of building raw materials and materials from the collection site to the site of activities or temporary stockpiling site;

-- Dredging activities of coast and or water (if required);

- Filling or reclamation activities in the activity site area (if required);
- Implementation of physical activities of the construction of the main facilities of collection site (tank farm) and liquid bulk loading/unloading facilities in accordance with the applied construction method, including the installation of piles, etc;
- Operation of heavy equipment required during the construction period;
- Implementation of physical activities of technical installation and equipment used, such as plumbing, conveyors, power generation, pumps, etc.
- Implementation of physical activities of non-principal facility construction, such as parking lots, landscaping works, fencing, roads and bridges, drainage, etc.

(The following should also be described: collection site of the raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment used, site and number of tank farms, capacity and type of liquid bulk to be unloaded-loaded).

13) Construction of Power Generators in the Port's working environment.

- Cutting of vegetation, land preparation, excavation or peeling of soil and rock layers on the area where the Power Generator will be built;
- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and other infrastructure;
- Collection of building raw materials (stone, soil, sand, water, etc.) and other materials required (steel plates, pipes, etc.);
- Transport of building raw materials and materials from the collection site to the site of activities or to the temporary stockpiling site;
- Dredging activities of coast or water (if required);
- Activities of filling or reclamation on the site of activities (if required);
- Implementation of physical activities of the construction of the facilities for Power Generator in accordance with the applied construction method, including the installation of piles, and other activities;
- Operation of heavy equipment required during the construction period;
- Implementation of physical activities of technical installation and equipment used, such as plumbing , power generator, heater, pump, etc;
- Implementation of physical activities of non-principal facility construction, such as construction of drainage, waste water channels, parking lot, roads and bridges, etc.

(The following should also be described: collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment to be used, location and capacity of the Power Generator and so on).

14) Construction of Factories (Plants) in the Port's working environment

- Cutting of vegetation, land preparation, excavation or top soil removal and rock layers on the area to be built;
- Construction of semi-permanent buildings (workers huts) for temporary accommodation of all workers and construction of other infrastructure;
- Collection of building raw materials (stone, soil, sand, water, etc) and other materials required (steel plate, pipes, etc);
- Transport of building raw materials from the collection site to the site of activities or temporary stockpiling site;
- Dredging activities of coast and or water (if required);
- Filling or reclamation activities on the activity location area (if required);
- Implementation of physical activities of the construction of the main facilities of plant building in accordance with the applied construction method, including the activities of installation of piles, etc;
- Operation of heavy equipment required during the construction period;
- Implementation of physical activities of the construction of the technical installation and equipment used, such as plumbing, conveyer, power generator, pump, etc;
- Implementation of physical activities of the construction of non-main facilities of plant building, such as construction of drainage, waste water channels/water treatment, roads and parking lot, fences and landscaping works, lighting, etc.

(The following should also be described: collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment used, location and capacity of plant, materials or raw materials as well as production process used).

15) Construction of Dock and Ship Facilities in the Port's working environment

- Cutting of vegetation, land preparation, excavation or top soil and rock removal and in the area where the dock and ship facilities will be built;
- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and other infrastructure;
- Construction of protective constructions for the temporary building/excavation including crib, cofferdam, etc.
- Collection of building raw materials (stones, soil, sand, water, etc) and other materials required (steel plates, pipes, etc.);
- Transport of building raw materials and materials from the collection site to the site of activities or to the temporary stockpiling site;
- Dredging activities of coast and or water, as well as building location;
- Activities of filling or reclamation on the site of activities;

-- Implementation of physical activities of the construction of docks and ships in accordance with the applied construction method including the activities of installation of piles, drainage channels, etc.

-- Operation of heavy equipment, or dredgers during the construction period;

-- Implementation of physical activities of technical installation and equipment used, such as power generator, pump, etc;

(The following should also be described: Collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment used, location and capacity of the corresponding facilities of docks and ships).

16) Construction of Facilities for Waste and Waste Processing

17) Construction of Passenger Terminal

-- Cutting of vegetation, land preparation, excavation or top soil removal and rock layers on the area on which the building will be constructed;

-- Construction of semi-permanent buildings (workers huts) for temporary accommodation of workers, and construction of other infrastructure;

-- Construction of protecting building for the temporary building/excavation including crib, cofferdam, etc;

-- Collection of building raw materials (stones, soil, sand, water, etc.) and other materials required (steel plates, pipes, etc);

-- Transport of building materials and materials, from the collection site to the site of activities or the temporary collection site;

-- Dredging activities of coast and or water, as well as location of building;

-- Filling or reclamation activities on the site of activities;

-- Implementation of physical activities of the construction of dock and ship facilities in accordance with the applied construction method;

-- Operation of heavy equipment required during the construction period;

(The following should also be described: Collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment to be used, location and capacity of the corresponding docking and ship facilities).

18) Construction of other facilities within the working environment of the port

c) Operational Phase

1) Construction of Roads and Bridges, Highways and Railway Tracks in the Port's working environment.

-- Traffic of people, goods and vehicles;

- Maintenance and repair activities;
- Expected maximum initial volume;
- Plans for emergency conditions, physical supporting resources and training programs required.

2) Construction of Break Water.

- Change of hydrodynamic patterns (current, waves and tides) after the construction period as well as the occurrence of sedimentation;
- Flow and traffic of shipping and goods as well as passengers;
- Ship operation while anchored in the water of the port's working environment;
- Maintenance and repair activities on break water;

3) Construction of Warehouse for Hazardous and Toxic Materials, Warehouse and Filling Yard.

- Operation and volume of loading-unloading of goods categorized as hazardous and toxic materials;
- Road transport of hazardous and toxic materials (B3) in the port's working environment;
- Maintenance and repair activities on the warehouse for hazardous and toxic materials;
- Plans for emergency conditions, physical support resources and training programs required to handle emergency conditions;

4) Dredging of Shipping lane/Harbor

- Change of hydrodynamic patterns (currents, waves and tides) after the construction period as well as the occurrence of sedimentation;
- Size and type of ships using the shipping lane and harbor;
- Estimated need for dredging for harbor maintenance and disposal procedure for dredging wastes.

5) Construction of Container Terminal

- Traffic of containers as well as operation of container loading-unloading equipment in the container terminal;
- Operation of container ships while anchored in the harbor;
- Transport of containers from/to the surrounding area, either by road or rail;
- Maintenance and repair activities of container terminal.

6) Destruction of Rocks

- Size and type of ship as well as its operation in the harbor working region;
- Change of hydrodynamic patterns (currents, waves and tides) after the construction period as well as change in the sediment transportation mechanism.

7) Construction of Deep Wells

- Operation of suction pump motors used;
- Change of depth of surface and quality of ground water;
- Water supply in terms of location and volume.

8) Reclamation Activities

- Change of hydrodynamic patterns (currents, waves and tides) after the construction period as well as possible change in sediment transportation mechanism.
- Nature and volume of materials used for reclamation.

9) Construction of Pier

- Number, size and type of ship as well as operations at the pier;
- Change of hydrodynamic patterns (currents, waves and tides) after the construction period as well as possible sedimentation;
- loading/unloading activities of and transport of goods from/to the hinterland;
- Pier maintenance and repair activities.

10) Shifting the River Flow

- Change of debit and river flow pattern as well possible sedimentation.

11) Construction of Dry bulk Loading/Unloading Facilities in the Port's working environment

- Loading-unloading activities and operation of dry bulk loading-unloading equipment (conveyor, etc.)
- Operation of dry bulk ships during docking and anchoring in the harbor water;
- Transport of dry bulk to/from the surrounding area by road or rail;
- Maintenance and repair activities for dry bulk loading/unloading facilities.

12) Operation of Facilities for Collection Site and Loading/Unloading of Liquid bulk in the Port's working environment (Tank Farm)

- Rehabilitation and reclamation of land disturbed and damaged due to the implementation of planned activities;
- Loading-unloading activities and operation of liquid bulk loading unloading equipment;
- Operation of liquid bulk ships during docking and anchoring in the harbor water;
- Transport of liquid bulk to/from the surrounding area by road or rail;
- Maintenance and repair activities of liquid bulk loading unloading facilities;
- Possibility of pipe rupture, leak and explosion as well as fire in the collection tank (tank farm);
- Tank rinsing with or without chemicals as well as the disposal method of liquid bulk waste.

13) Construction of Power Generator in the Port's working environment.

- Method of fuel transport and fuel handling system;
- Estimated spillage in accordance with the observation to the similar facilities;
- Volume, composition, scheduling and other detail of emission to the air, liquid output, noise and solid waste disposal expected;
- Maintenance and repair activities of Power Generating facilities.

14) Construction of Factories (Plants) in the Port's working environment

- Method of transporting fuel and material input (raw materials) as well as auxiliary materials and the system of handling;
- Technology and process of production applied as well as operation of the liquid, gas or solid waste disposal system;
- Characteristics of material and raw materials used according to the physical, mechanical, chemical, electrical or magnetic properties;
- Maintenance and repair activities of the industrial (plant) facilities and installations.

15) Construction of Dock and ship facilities in the Port's working environment

- Implementation of docking works or production of ships in the corresponding docking facilities as well as welding works;
- Operation of heavy equipment required in the docking works;
- Possible petroleum, oil spillage or ballast water disposal in the implementation of docking operations;
- Maintenance and repair activities of docking facilities and ships.

Chapter III. Initial Environmental Characteristics

In this chapter, environmental information should be presented as completely as possible, regarding:

1. Environmental characteristics existing in the site of planned activities, inside and in the vicinity of port's working environment, the appropriate distance of the planned activities/project location of port construction and development before the planned activities are started.

Significant environmental components must receive specific attention such as rare wild animals, archeological remains, environmental characteristics with famous natural beauty, disputed land, as well as socio economic and social cultural conditions of the community.

2. Qualitative and quantitative conditions from various natural resources existing in the vicinity of planned activities/project location of port construction and development, either those which have been and will be utilized or those which are not yet in potential form. Description of these natural resources must be shown on a map of adequate scale from (1:500) up to (1:5,000) and equipped with the diagrams, figures, graphics or pictures.

3. Data and information of initial environmental characteristics, regarding:

a. Climate and Air Quality

1) Climate components: type, air temperature (maximum, minimum, average), air humidity (average), hours of sunlight and solar intensity (average), cloud covering (average), air pressure (average), wind (wind direction, highest velocity in one month and average velocity), rainfall (rainfall and number of rainy days) and evaporation.

(These data and information can be obtained by means of a feasibility study).

2) Periodical data of disasters (annual cycle, every five years, etc.) such as hurricanes in the location of planned port construction and development activities/project;

3) Meteorological and geophysical stations representing the location of planned activities, inside and in the vicinity of the port's working environment;

4) Air quality (ambient and emissions) in the location of the planned activities, inside and in the vicinity of the port's working environment.

(This information is obtained from the results of laboratory analysis).

5) Micro climate pattern, distribution pattern of air contamination materials, in general and in worst weather condition;

6) Sources of noise and vibration, noise and vibration level as well as its period of occurrence.

b. Physiography

1) Topography of land form (morphology) in the port's working environment and seismic information in the location of planned activities and the surroundings.

(Data and information can be obtained from the results of the feasibility study).

2) Type of soil, chemical characteristics (land fertility, elements contaminating the soil, etc) and soil physics (depth of soil, texture, structure, porosity, permeability, specific weight and color).

(Information is obtained from the results of laboratory analysis).

3) Uniqueness, particularity and sensitivity of natural and land forms as well as geologically.

(Information regarding the corresponding physiography should be shown on a map of a scale of 1:500 at the location of the planned activities and of 1:5,000 at the port's working environment).

c. Hydrology and Water Quality

1) Physical characteristics of rivers, swamps;

2) Average debit, monthly and annual (flood and standing water);

3) Sedimentation content (mud) and erosion level;

4) Fluctuation and potential of ground water (shallow and deep);

5) Water provision and requirement/utilization level for drinking water, industrial requirements, etc.

6) Quality of physical, chemical, and microbiological properties of water such as: temperature, dissolved oxygen content, mineral content etc in accordance with the passing season;

7) If there is heavy metal in water, heavy metal content in the sediment should be examined.

d. Hydrooceanography and Limnology

1) Marine hydrodynamic pattern such as tides, currents and waves, concerning at least two observation periods, each for two months.

The marine hydrodynamic pattern should also include information on: magnitude, velocity, long, short, frequency of waves, magnitude and frequency of tidal waves (tsunami), current circulation patterns, etc.

(These data and information can be obtained from the feasibility study).

2) Coastal interaction (sedimentation or abrasion) and interaction with weather;

3) Quality of water in terms of the physical, chemical, microbiological as well as radioactivity properties of the water such as: temperature, dissolved oxygen content, mineral content, color, turbidity, floating materials (plastic, synthetic materials, etc), oil film, organohalogen substance, mercury substance and mercury, cadmium substance and cadmium, radioactive waste, arsenic, lead and its mixtures, copper, zinc, organosilicone mixtures, cyanide, fluoride, pesticide, beryllium, chromium, nickel substance and nickel, vanadium, etc in accordance with the season;

4) Condition and process of physical oceanography and limnology or fluviology.

This information must be complete with a sounding map of a scale of from 1:500 to 1:5,000 and should be reviewed and obtain special attention on the bathietric characteristics and phases affecting navigation security.

e. Space, Land and Soil

1) Inventory of the use of soil or land and other resources when the planned port construction and development activities/project is applied and their future potential at the location of the planned port construction or development activities/project. (This information must be completed with Decree regarding the land use and its allocation, the boundaries of the port's working environment issued by the authorized institution).

2) Regional development plans, layout plans, plans for land use and other natural resources which are officially or non officially, prepared by the local Government at the Regency, Provincial or National levels at the location of the planned port construction or development activities/project and its surroundings.

(Information must be complete with the local government Master Plan).

3) Possible conflict or limitations which occurs between the plans of layout, land use and other natural resources presently prevailing with the presence of ownership/determination of location for the planned port construction and development activities/project.

4) Inventory of historical remains (biology, geology and archaeology) at the location of the planned port construction and development activities/project and its surroundings which are estimated to require protection.

5) Inventory of aesthetical values and landscape beauty as well as the recreational region existing at the location of the planned port construction and development activities/project.

f. Flora and Fauna

1) Flora

a) Map of biogeoclimatic zone of natural vegetation in the location of the planned port construction and development activities/project. If there is a natural community of tropical plants, the composition and structure of the plant community as well as its maturation level must be described;

b) Description of various plant communities located in the location of planned activities/project and its surroundings, either in the environment which is still natural or developed by human beings (land and water forests, plants, plantation, coastal ponds, cultivation, etc.);

c) Description of the community of unique, undisturbed plants, because they have historical value (natural and cultural), landscape beauty and recreational as well as specific economic and ecological value;

d) Description of the community of plants in the water zone including its unique habitat.

2) Fauna

- a) Estimation of distribution, pattern of migration, population density of animals (amphibians, reptile, birds, mammals, etc);
- b) Estimation of distribution and population density of invertebrates and insects which are considered important, because they have a roles and potential as food materials or sources of pests and disease and types of animals in number (1) above.

List of invertebrate animals together with their roles should also be arranged systematically.

Water zones should also necessarily be complete with data and information on: estimated population density of animals (plankton, fish, benthos, nectos, water bacteria) as well types of coral reefs.

- c) The life of important animals above shall include the method of breeding, cycle and life balance, methods of spawning, hatching and giving birth, raising their young, behavior in the region and their territory, as well as their habitat;
- d) Habitat of important animals which may possibly be affected by and subject to negative impacts due to the planned port construction and development activities/project, thus possibly resulting in critical conditions for the survival of important animals.

Flora and fauna survey boundaries shall be limited inside and in the vicinity of the planned port construction and development activities/project and can be extended as long as they remain related with the planned port construction and development activities/project.

g. Social Cultural and Social Economic Aspects

1) Environmental characteristics of social culture and social economy of the community in the location of the planned port construction and development activities/project and its surrounding, shall include:

- a) conditions of the social cultural and social economic activity center, means of livelihood, and income as well as applicable formal and informal taxation system;

(Data and information can be obtained from the feasibility study).

- b) population structural conditions, including total population, heterogeneity of population, as well as the existing population pattern, structure in terms of age, sex, education, health, belief, heterogeneity of prevailing values and norms;

(Data and information can be obtained from the feasibility study).

- c) daily living, customs, manners, intra and inter community group interaction, system of belief, heterogeneity of and prevailing norms;
- d) attitudes, values, and perception of various community groups in regards of their environments and their community life;
- e) distribution of power, prevailing social stratification and vertical and horizontal mobility systems, differentiation, and diversification in the community;
- f) integration and cohesion of various community groups;

- g) conditions of institutional order in the community, either traditional or modern;
 - h) relation with other regions or locations from various community groups;
 - i) experience of social change, contact with other cultures, and adaptation methods carried out;
 - j) social cultural facilities which are possibly located in the local community environment;
 - k) historical cultural remains which may possibly be affected by the impacts due to the presence of the planned port construction and development activities/project;
 - l) social problems existing in the community as well as the method of handling them;
 - n) conditions of facilities and health of the community in the vicinity;
 - o) other matters considered important.
- 2) Description of the need for settlement for the workers for the planned port construction and development activities/project being proposed and possible growth of unauthorized settlements (not planned by the initiator and local government) due to the presence of job opportunities directly or indirectly resulting from the planned port construction and development activities/project;
- 3) Description of the attitudes and responses of local community to the possibility for the implementation of the planned port construction and development activities/project in the vicinity of their residence, which will result in various impacts (the flowing of workers from various regions, investment, working opportunities, new life activity pattern, etc):
- 4) Description on the mutual relations between the present community activities and future community activities if the planned port construction and development activities/project has been started and is in operation, particularly in the analysis of possible presence of relations which:
- a) are mutually supporting;
 - b) result in conflict;
 - c) has no association with community activities before and after the planned port construction and development activities/project is conducted.

Chapter IV. Estimation of Significant Impacts

This chapter should contain the following:

1. Discussion of both positive and negative significant impacts which may possibly emerge due to various activity components in the planned port construction and development activities/project.

This discussion must be based on the data and information obtained in the field (secondary and primary data), and must cover possible short-term and long-term impacts, either in the pre-construction, construction and postconstruction phases of the planned port construction and development activities/project.

If the factual data and information are not available, or not reliable, the report needs to explicitly state that such estimation of significant impacts is based on subjective considerations, because there are discrepancies in the data and information.

2. Categorization of significant impacts due to the presence of the planned port construction or development activities/project shall be classified into direct and indirect impacts. Direct impacts are those directly resulting from the presence of the port construction and development activities/project .

While indirect impacts are those resulting from the secondary activities induced by the presence of activities/project of port construction and development.

This category shall be valid for all potential direct impacts, which may result from the presence of the activities/project of port construction and development and other activities it induces.

3. Directions for a number of topics are presented below:

a. Climate and Air Quality Potential significant impacts from the planned port construction and development activities/project which can result in the change of climate and air quality or disturbances in form of noise and vibration must be described in detail.

b. Physiography Potential significant impacts from the planned port construction and development activities/project on:

1) Slope stability, landslide (erosion due to the presence of land for the benefit of the planned activities of excavation, dredging, etc);

2) Form or properties and unique nature of the land as well as the change of land appearance and convenience;

3) Change/modification of land due to excavation, filling of soil or sand, collection of raw materials (stones, lime, sand, etc) or waste disposal in form of land filling.

c. Hydrology and Water Quality Potential significant impacts from the planned port construction and development activities/project on:

1) Disturbances to river flow and change of the surface and bodies of water (swamp, water, etc);

2) Change of flow direction in river flow patterns including the addition of water volume;

3) Change of the depth of water zone;

4) Magnitude of flood as well as destructive effects;

5) Formation of standing water;

6) Quality of surface water (water) and sedimentation, turbidity level, dirtying because of garbage and waste, contamination by hazardous and toxic materials, etc.

7) Quality of ground water.

d. Hydrooceanography Potential significant impacts from the planned port construction and development activities/project on:

- 1) Changes in physical, chemical, microbiological and radioactivity qualities/properties of sea water;
- 2) Change to the marine hydrodynamic pattern (current direction, waves and tides);
- 3) Change of sedimentation pattern and coastal geography;
- 4) Quality of water in regards of physical, chemical properties and water microbiology as well as radioactivity such as: temperature, dissolved oxygen content, mineral content, color, turbidity, floating materials (plastic, synthetic materials, etc), oil film, organohalogen substance, mercury substance and mercury, cadmium substance and cadmium, radioactive waste, arsenic, lead and its mixtures, copper, zinc, organosilicone mixtures, cyanide, fluoride, pesticide, beryllium, chromium, nickel substance and nickel, vanadium , etc in accordance with the season;
- 5) Condition and process of physical oceanography and limnology or fluviology.

e. Layout Potential significant impacts from the planned port construction and development activities/project on:

- 1) Change, limitation, dispute in the use and utilization of land, water and other natural resources due to the planned activities;
- 2) Change of natural beauty and loss of opportunity to enjoy the aesthetic and recreational sources because of oil spillage, turbidity, dirt and garbage, liquid or solid wastes, hazardous and toxic materials;
- 3) Land having natural historical remains, or a unique ecosystem which should be maintained;
- 4) Planning for regional development, layout and use of land, other resources which have been legalized by the local government.

f. Flora and Fauna

1) Flora Potential significant impacts from the planned port construction and development activities/project on:

- a) Change and loss as well as damage to plant community at the location of the planned activities and its surroundings;
- b) Sensitive plant communities and protection forest (such as mangrove along the beach and the vicinity), together with wild animals found in it;
- c) Damage of plants useful for the benefits of economy and ecology of human beings due to the oil spillage or leaks and/or oil, turbidity, dirt and garbage, liquid or solid wastes, or other hazardous and toxic materials;
- d) Green belts separating one zone with important development zone shall be preserved and maintained.

2) Fauna Potential significant impacts from the planned port construction and development activities/project on:

- a) Migration pattern of animals (fish, invertebrate, amphibians, reptile, mammals, plankton, benthos, and necton), location to find foods, place of hatching, place of spawning etc. from various types of the corresponding animals);
- b) Place of meeting, territorial region of animals, fish, birds etc;
- c) Death of animals, fish, etc. due to petroleum and or oil spillage or leaks, or lubricating oil, liquid or solid waste, turbidity, garbage and dirt or due to the use of hazardous and toxic materials in the planned activities;
- d) Extinction of animals or rare fish;
- e) Disturbances in form of expulsion or noise to wild animals.

g. Social Economic and Social Cultural Aspects Potential significant impacts from the planned port construction and development activities/project on:

- 1) Conditions in centers of economic and tourism activities, infrastructure, means of livelihood (decreasing **fishery** production, etc) and earnings of residents;
- 2) Structural of residents, including the number, density, heterogeneity of population as well as earnings of residents;
- 3) Daily life, customs, manners, intra and inter community group interaction, system of belief, heterogeneity of values and norms;
- 4) Attitudes, values, and perception of various community groups in regards of their environments and plans for relocating and distributing the residents (among others, unrest of residents);
- 5) Distribution of power, social stratification system and difference and diversification in the community;
- 6) Integration and cohesion of various community groups;
- 7) Conditions of institutional order in the community;
- 8) Relation with the region or location of various community groups;
- 9) Change, disturbances, damage of historical cultural remains which should be preserved;
- 10) Condition and order of power system;
- 11) Land speculation;
- 12) Condition of facilities and health as well as the security of the surrounding community;
- 13) Use of workers both from inside and outside the area surrounding location of planned activities.

Chapter V. Evaluation of Significant Impacts

In this chapter the following shall be described:

1. Causative relations between the planned port construction and development activities/project and environmental characteristics with positive and negative impacts which may arise, at the location of planned activities, inside and in the vicinity of the port's working environment.

It is possible that significant impacts emerge from the planned activities to the environmental characteristics, because such planned activities are carried out in a location too heavily populated, or at an income and education level which is too low, or using inappropriate technology, etc.

2. The nature of these significant impacts needs also be clearly stated, namely whether the significant impacts, either positive or negative, will continue to persist when the planned activities are taking place. Or there will be antagonistic or synergistic mutual relation between one impact and another impact.

If possible it is also necessary to describe when the limit threshold of these significant impacts will begin to emerge after the planned activities are carried out or will continue to persist after the pre-construction period and end with the completion of the planned activities. Or it may possibly continue, for example for more than one generation.

3. Community groups which will be affected by negative impacts and those affected by positive impacts.

Identification of discrepancies between the change expected and one which may possibly occur due to development activities.

4. Possible areas which will be affected the significant impacts, whether the latter can only be felt locally, regionally, nationally or even internationally, crossing the boundaries of the state of the Republic of Indonesia. Therefore, it is necessary to describe also the controlling proposal viewed from government capacity aspects of overcoming the negative impacts and developing positive impacts at the district, regency, provincial levels, central government or between states.

5. Alternative approaches in controlling negative impacts and developing positive impacts should comprise:

a. Economic Approach -- For example through the development of incentive and disintensive systems in economic fields, or assistance from the government to handle the environmental problems.

b. Technological Approach -- For example by means of limiting, isolating or neutralizing the types of hazardous and toxic materials. Or by means of changing the process to prevent or to reduce the volume of the existing effluent or possibly also by means of recycling the wastes/effluent.

c. Institutional Approach -- For example by means of enlarging the management system so that matters in regard of the handling of environmental problems shall also be included. Or by encouraging cooperation with various parties to improve supervision.

If it is possible, by means of re-planning the zoning system so that the distance between the source of contamination and residents should be considered.

Of course, the approach in controlling the negative impacts and developing the positive impacts may be optional or may also constitute a combination required either in a simultaneous or sequential period.

6. Description of alternatives for environmental management and monitoring at the site of activities, inside and in the vicinity of port's working environment, if the planned activities have been materialized.

This description should include the following:

- a. The start of environmental management and monitoring programs and their frequency.
 - b. Environmental management and monitoring methods comprising not only biogeophysical-chemical factors, but also social economic and social cultural aspects.
 - c. Utilization of the results of environmental management and monitoring as feedback for the improvement of environmental control system into, or outside the planned activity boundaries.
7. Analysis of disasters and analysis of risks if the planned activities are in the region of natural disasters or near the source of natural disaster.

Chapter VI. Attachments

The attached materials should be mentioned in this chapter.

1. Approval Letter of the Central Commission for AMDALHUB/Regional Commission or recommendations which has been obtained by the Initiator up to the time when the Environmental Evaluation Study (SEL) is made.
2. Letters of recognition, decision, qualification, reference for the implementation persons and researchers as well as the producer of Environmental Evaluation Study (SEL).
3. Pictures (black and white or color) which can illustrate the environmental characteristics, proposal of activities thus providing a better understanding of the mutual relation as well as to allow for the significant impacts to result.
4. Diagrams, maps, figures, graphics, and tables which can support all description stated by their sources, if they are truly cited or taken from certain bibliographical materials.
5. Other matters deemed necessary or relevant to be included in these annexes.

Chapter VII. Biodata of the ANDAL Producer

PIL Producer must have expertise in the required discipline of knowledge and possess the basic qualification of AMDAL A or B.

Minister of Transport

Ir. Azwar Anas

Attachment I.C to Decree of the Minister of Transport

Number: KP.4/UM.501/PHB-90

Date: March 19, 1990

Technical Guidelines for Environmental Evaluation Report (PEL)

Ports sector

Chapter I. Introduction

1. Identity of Responsible Person Name and complete address of the responsible person.
2. Identity of PEL Preparer Name and complete address of the PEL preparer.

Chapter II. Brief Description of Port Activities

1. Type of Port.
2. Location of port together with the maps of a scales from 1:10,000 to 1:50,000.
3. Estimation of the period of port activities Economic lifetime and technical lifetime.
4. Outlines of Port Activities:
 - a. Construction Phase
 - 1) General description of activities and schedule, among others:
 - a) Roads and Bridges:
 - (1) Top soil removal in the areas on which roads will be constructed;
 - (2) Type of road construction applied including the protection against landslip of embankments and landslide prevention;
 - (3) Channel crossing mechanism and location;
 - (4) Method of transport used;
 - (5) Handling of disturbances to ecological balance, human interest and environmental contamination during the construction period;
 - (6) Use of heavy equipment;
 - (7) Handling of workers released after the construction period.
 - b) Break Water:
 - (1) Dredging of shipping lane and harbor;

- (2) Type of break water construction applied;
- (3) Reclamation of coastal waters;
- (4) Change of current patterns during the construction period of break water;
- (5) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (6) Use of heavy equipment and dredgers;
- (7) Handling of workers released after the construction period.

c) Storehouse:

- (1) Reclamation of water and coast;
- (2) Type of break water construction applied;
- (3) Reclamation of water and coast;
- (4) Change of current pattern during the construction period of break water;
- (5) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (6) Use of heavy equipment;
- (7) Handling of workers released after the construction period.

d) Dredging of shipping lane/harbor:

- (1) Location and depth, as well as type and volume of sand/mud dredged;
- (2) Method of sand/mud dredging applied and prevention of landslide from the shore;
- (3) Method of raising the sand/mud resulted from the dredging;
- (4) Location and distance of collection of the sand/mud resulting from the dredging;
- (5) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (6) Use of heavy equipment and dredgers;
- (7) Handling of workers released after the construction period.

e) Container Terminal:

- (1) Top soil removal in the area on which the container terminal will be built;
- (2) Type of container terminal construction applied;

- (3) Reclamation of water and coast:
- (4) Construction of piles or foundation on the shore in the interests of the terminal;
- (5) Dredging the water or coast (harbor);
- (6) Method of transport and location as well as distance of collection of sand/mud resulting from the dredging;
- (7) Method of transport used, location and distance of temporary stockpiling of building materials such as stones, sand, soil, etc;
- (8) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (9) Use of heavy equipment;
- (10) Handling of workers released after the construction period.

f) Destruction of rocks:

- (1) Type, volume and location of rocks to be blasted;
- (2) Method of destruction or blasting of rocks applied;
- (3) Type, category and explosive power of the explosive materials used;
- (4) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (5) Method of collection and transport of rocks to the collection site;
- (6) Handling of workers released after the construction period.

g) Construction of deep wells:

- (1) Number, location and depth of the wells drilled;
- (2) Method of drilling used;
- (3) Amount, type of chemicals used in the drilling;
- (4) Method of transporting the drilling equipment, pipes required and other materials to the drilling site;
- (5) Capacity of well production every hour;
- (6) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (7) Handling of workers released after the construction period.

h) Reclamation activities:

- (1) Amount and location of materials (sand and mud) obtained;
- (2) Method of collection and transport of materials to the reclamation site;
- (3) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (4) Use of heavy equipment and dredgers;
- (5) Handling of workers released after the construction period.

i) Piers:

- (1) Dredging of water or coast;
- (2) Reclamation activities for water and coast:
- (3) Construction of foundation or piles for the corresponding pier;
- (4) Method of transporting the equipment and building materials;
- (5) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (6) Use of heavy equipment and dredgers;
- (7) Handling of workers released after the construction period.

j) Rerouting of rivers:

- (1) Volume, location and method of soil collection for the new river flow region and method of transport to the filling site;
- (2) Reclamation and dredging activities of the river flow:
- (3) Change of river flow pattern during the construction period;
- (4) Construction of land retaining banks;
- (5) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
- (6) Handling of workers released after the construction period.

k) Dry bulk loading/unloading facilities:

- (1) Reclamation and dredging of water or coast;
- (2) Type and volume of dry bulk to be loaded/unloaded;

- (3) Method of construction of loading/unloading facilities used;
 - (4) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
 - (5) Use of heavy equipment;
 - (6) Handling of workers released after the construction period.
- l) Liquid bulk filling site (tank farm):
- (1) Number of tanks and capacity of each liquid bulk tank;
 - (2) Type of liquid bulk tank used;
 - (3) Method of transporting the raw materials, equipment and materials required to the site;
 - (4) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
 - (5) Use of heavy equipment;
 - (6) Handling of workers released after the construction period.
- m) Liquid bulk filling site (tank farm):
- (1) base camp and other facilities:
 - (2) Dredging and reclamation of water and coast;
 - (3) Type of industrial building construction applied:
 - (4) Channels for rain water and plant wastes;
 - (5) Method of transporting the raw materials, machines and equipment used;
 - (6) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;
 - (7) Use of heavy equipment;
 - (8) Handling of workers released after the construction period.
- n) Facilities for docks and ships:
- (1) Dredging and reclamation of water and coast;
 - (2) Type of construction of facility for docks and ships used:
 - (3) Method of transporting the raw materials, machinery and equipment used;

(4) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;

(5) Use of heavy equipment;

(6) Handling of workers released after the construction period.

o) Passenger terminal:

(1) Type of construction of passenger terminal facilities;

(2) Method of transporting the raw materials, machinery and equipment used;

(3) Handling of disturbances to the ecological balance, human interest and environmental contamination during the construction period;

(4) Handling of workers released after the construction period.

p) Power generator:

(1) Type and number of power generators;

(2) Capacity and power.

2) Area used for the said activities;

3) Type and capacity of equipment used.

4) Main building materials shall comprise:

a) Type and amount;

b) Collection site and method;

c) Temporary collection site and distance;

d) Final disposal of effluent materials.

5) Workers:

a) Number, education and skills of the workers required;

b) Origin, age and sex of the workers;

c) Accommodation for workers.

b. Post-Construction Phase (operational)

1) Types of activities at the harbor shall comprise:

a) Ship anchorage;

- b) Ship towing;
- c) Piloting;
- d) Docking;
- e) Loading/unloading;
- f) Storage/stockpiling of goods;
- g) Passenger services;
- h) Other supporting services.

ENFLEX Note: Paragraphs 2) and 3) were omitted from the original translation. The text will be revised upon receipt of the translation.

4) Wastes:

- a) Type;
- b) Amount/volume;
- c) Management system.

5) Workers:

- a) Number of workers, education and skill;
- b) Sex/age;
- c) Origin of the worker;
- d) Accommodation.

c. Relation with other activities:

- 1) Distance of port activity location from other activities such as residential areas, factories located in the vicinity of port, etc;
- 2) Other sources affected by the activity impacts, such as the number of residents relocated, area for other uses affected by the port project etc;
- 3) Other activities located in the vicinity of port activities and their relationship;
- 4) Effects of port activities on the social cultural, social economic activities, security and prosperity of the surrounding community.

Chapter III. Brief Description of the Environmental Characteristics

1. Climate

- a. Type of climate;
 - b. Temperature (maximum/minimum);
 - c. Rainfall and number of rainy days;
 - d. Wind conditions (direction and velocity according to the season);
 - e. Air quality and noise;
 - f. Humidity.
2. Physiography and Geology:
 - a. Morphology;
 - b. Topography and hydrography;
 - c. Geological structure, location of faults and seismic.
3. Hydrology:
 - a. Physical characteristics of river, sea, swamp (low tide, current);
 - b. Quantity (maximum/minimum debit) and quality of river water, of sea water including physical, chemical, biological and radioactivity properties;
 - c. Area of the river flow region;
 - d. Sources of drinking, bathing and washing water (quality and quantity);
 - e. Surface water absorption region and ground water conditions (depth, debit and quality);
 - f. Other water allocations such as industry, agriculture and so on.
4. Hydrooceanography: Marine hydrodynamic pattern comprising:
 - a. Currents, waves and tides;
 - b. Sedimentation and abrasion;
5. Space, soil and land:
 - a. Type of soil;
 - b. Structure and texture of soil;
 - c. Stability and suitability of land;
 - d. Layout and use of land;
 - e. Land allocation (including land aesthetic value as a percentage of its value).

6. Biology

a. Flora:

- 1) Type of flora having economic and aesthetic value both on land and water, comprising the variety and similarity indexes;
- 2) Type of flora protected both on land and water.

b. Fauna:

- 1) Type of fauna having economic and aesthetic value both on land and water, comprising the population and variety index;
- 2) Type of fauna protected both on land and water.

7. Social Economy and Social Culture

a. Social Economy:

- 1) Available transport facilities and infrastructure;
- 2) Income and means of livelihood of the surrounding residents;
- 3) Job and trade opportunities;
- 4) Mobility.

b. Social Culture

1) Population

- a) Number of residents by age and sex;
- b) Education;
- c) Religion;
- d) Health;
- e) Security.

2) Attitude and perception of community towards the port construction;

3) Social cultural conditions and traditions:

- a) Physical;
- b) Non-Physical.

4) Other matters considered necessary.

Chapter IV. Environmental Impact Evaluation and Its Handling

1. Estimation of Impacts -- Estimation of impacts upon the factors of climate, physiography and geology, hydrology, space and land, biology, social economy, and social culture of the community in the vicinity during both the construction and operational phases.

2. Evaluation of Impacts -- Evaluation of the magnitude of environmental impacts shall be defined in accordance with:

- a. Number of population affected by impacts;
- b. Area of impact distribution;
- c. Duration of impacts;
- d. Intensity of impacts;
- e. Number of other environmental components affected by the impacts;
- f. Cumulative property of impacts;
- g. Reversibility or irreversibility of the impacts;

3. Alternative Handling of Impacts

- a. Handling of disturbance to ecological balance, human interest and environmental pollution during pre-construction, construction and postconstruction;
- b. Workers released after pre-construction, construction, post-construction.

Chapter V. Bibliography

In this chapter, sources of data and other information which have been used should be stated such as books, magazines, papers, articles, and other media organized as follows:

1. Name of author or name of editor, either name of person or name of institution.
2. Issuance year of book, magazine, paper, article, and other media.
3. Publisher of book, magazine, paper, article, and other media.
4. Place of issuance of book, magazine, paper, article, and other media.

Chapter VI. Attachments

The attached materials should be mentioned in this chapter.

1. Approval Letter of the Central Commission for AMDALHUB/Regional Commission or recommendation which has been obtained by the Initiator up to the time that the Environmental Evaluation Study (SEL) is made;

2. Letters of recognition, decision, qualification, reference for the implementing persons and researchers as well as the producer of Environmental Evaluation Study (SEL);
3. Pictures (black and white or color) which can illustrate the environmental characteristics, proposal of activities hence thus providing better understanding of the mutual relations as well as to allow for significant impacts to result;
4. Diagrams, maps, figures, graphics, and tables which can support all description stated by their sources, if they are truly cited or taken from certain bibliographical materials;
5. Other matters deemed necessary or relevant to be included in these annexes.

Chapter VII. Biodata of the Preparer of Environmental Evaluation Presentation (PEL)

PEL Preparer must have expertise in the required discipline of knowledge and possess the basic qualification of AMDAL A or B.

Minister of Transport

Ir. Azwar Anas

Attachment I.D to Decree of the Minister of Transport

Number: KP.4/UM.501/PHB-90

Date: March 19, 1990

Technical Guidelines for the Environmental Evaluation Study (SEL) Ports Sector Summary

Summary of Environmental Evaluation Study (SEL) should be prepared so that it can:

1. State directly the important inputs useful for decision making and management of the type of activity in improvement to environmental management.
2. Be easily understood by all parties including the community and easily summarized for placement in the mass media if deemed necessary.
3. Contain brief descriptions of:
 - a. Type of activities which have been carried out with various significant impacts which occur as well as various efforts which are being and will be conducted by the responsible person and other party concerned to handle the significant impacts either during the construction and or postconstruction phases.
 - b. Environmental management and monitoring which have been and will be conducted by the responsible person and other concerned parties to handle the significant impacts which emerge or possibly emerge due to the corresponding activity;
 - c. Information regarding the possible discrepancy in data, information, as well as various inadequacies and limitations, faced during the implementation of Environmental Evaluation Study (SEL);
 - d. Other matters deemed highly necessary to complete this summary.

Chapter I. Introduction

The Introduction Chapter shall comprise:

1. Backgrounds Brief description of the background to the implementation of Environmental Evaluation Study (SEL) for the port operational activities and its planned development viewed from:

- a. Applicable regulations and guidelines either at the Central or Regional level and environmental Quality Standards which must be applied as the reference for the recent activities/project.
- b. The bases of environmental management policies of all related institutions, either at Central or Regional level.
- c. Relation of the port operation activities and its planned development with significant impacts resulting and which may emerge due to the port operation as well as environmental impacts to the port.

2. Objectives of Study

a. Purpose and objectives Purpose and objectives of the implementation of Environmental Evaluation Study (SEL) for the port operation and its development are:

- 1) To identify the activities/project of port construction and development particularly those causing significant impacts upon the environment;
- 2) To identify the initial environmental characteristics, particularly those which have been and will be affected by significant impacts at the site of the planned activities, inside and in the vicinity of the port's working environment;
- 3) To estimate and evaluate the significant impacts upon the environment both positive and negative, at the site of the activities, inside and in the vicinity of the port's working environment;
- 4) To give suggestions for environmental management and monitoring at the site of the activities, inside and in the vicinity of the port's working environment;

b. Benefits

Benefits of the Environmental Evaluation Study (SEL) is to assist in the process of decision making, environmental planning and management of the port operation and its development inside and in the vicinity of the port's working environment.

3. Scope of Study

Scope of the Environmental Evaluation Study (SEL) shall be determined by 2 (two) matters:

A. Regional boundaries which must be covered in the study are:

- 1) Planned activity boundaries;
- 2) Administrative boundaries;

- 3) Ecological boundaries;
- 4) Technical boundaries.

b. Environmental aspects which should be investigated in the Environmental Study (SEL) are: those of geology, physiography, hydrology, air quality and noise, quality of land and ground water, flora and fauna, social economy and social culture.

4. Methodology

Description of methodology required in the Environmental Evaluation Study (SEL) of the port operation activities and its development:

- a. Method and technique of collection and measurement of initial environmental characteristics data;
- b. Method of analysis and evaluation of initial environmental characteristics data;
- c. Method for identification, estimation and evaluation of significant impacts.

Chapter II. Recent and Current Port Operation Activities and Development

1. Statement of Purpose and Objectives Give description of the purpose and objectives including:

- a) Clear identification of the Responsible Person for the activities including:
 - 1) Name and complete address of the institution/company as the initiator;
 - 2) Name and complete address of the responsible person for the implementation.
- b) Identity of the Preparer of the Environmental Evaluation Study comprising:
 - 1) Name and complete address of the institution/company together with its qualifications and references;
 - 2) Name and complete address of the responsible person for the production of Environmental Evaluation Study (SEL).
- c) Statement About the Clear Purposes and Objectives Purposes and objectives of the port operation activities and planned port development (recently/and currently) shall be stated in a systematic and concise way, coming directly to the point.

While the types of activities included under port operation activities and its planned development as follows:

- 1) Land appropriation, clearance and transfer in the port's working environment;
- 2) Operation and development of roads and bridges, highways and train rail tracks in the port's working environment;
- 3) Presence and development of the break water;

- 4) Operation and development of warehouse, storehouse for hazardous and toxic materials as well as field for fertilization;
- 5) Dredging the shipping lane and harbor as well as mud removal;
- 6) Operation and development of Passenger Terminal;
- 7) Operation and development of Container Terminal;
- 8) Destruction of rocks;
- 9) Operation and development of deep wells;
- 10) Reclamation activities;
- 11) Operation and development of Pier;
- 12) Rerouting river flow;
- 13) Operation and development of dry bulk loading/unloading facilities in the port's working environment;
- 14) Operation and development of site of filling and unloading/loading of liquid bulk (tank farm) in the port's working environment;
- 15) Operation and development of the PLTU (Steam Power Generation Plant), Power Generator in the port's working environment;
- 16) Operation and development of industry (plant) in the port's working environment and the port interest region;
- 17) Operation and development of docking and ship facilities in the port's working environment;
- 18) Operation and development of the collection of ship waste and other waste from port activities;
- 19) Operational activities at the harbor, among others: ship washing, ship movement;
- 20) Other activities having potential of capable resulting significant impacts in the port's working environment and its surroundings.

2 Use, Necessity and Alternatives Description containing the considerations about:

- a. Use and necessity why the port activities are carried out, either viewed from the interest aspect of Initiator or from the aspects supporting the regional construction and development programs;
- b. Appropriate location where the planned development will be carried out in the port's working environment, hence its appropriate use is known;
- c. When the port construction and development will start to be carried out and its construction is completed to fulfill the expected use and necessity.

d. Alternatives for the implementation which have been prepared so that the activities which have been in progress shall satisfy and conform to the existing policies and planning of development, either locally, regionally or nationally as well as feasible according to the feasibility study.

In presenting these alternatives, equal/similar factors should first be studied from various alternatives, then their differences between one alternative and other alternative be stated.

3. Description of Activities and their Components Description in regards of:

a. Determination of boundaries of land which will be used directly for the activities. Determination of these land boundaries must be shown on maps of a scales of from 1:1,000 to 1:10,000 which can show the interrelatedness and layout of the site of the activities and port development with other activities, such as settlement (general settlement developed by human beings) and natural environment located in the vicinity of the activities.

Archeology, historical remains and other sensitive, critical and specific regions located in or near the sites of the port activities and development must be marked with special sign on the maps.

b. Relation and distance between the sites of the port activities and development with the sources of building raw materials (stone, soil and sand), water resources, energy, human resources required by the such activities. This relation should be stated in the maps with adequate scale (1:5,000);

c. The site of the activities shall be shown on maps showing the relation between the buildings and other structures: highways, train rail tracks, pier, container terminal and so on to be built in the site with maps having adequate scale (1:500).

If other buildings and structures which have been and will be built turn out to experience deviation from the design standard, they should be cautiously stated and reasons should also be indicated why such deviations are necessary.

d. Components of the activities which are estimated to have resulted or will result in significant environmental problems, among others:

1) Impacts of the port site to the natural resources and environment, among others:

- a) Breeding and spawning areas;
- b) Fish catchment area;
- c) Degradation of land and water in the vicinity including the residential community and other allocation.

2) Impacts of the disposal of unused dredging wastes:

- a) Fish breeding and spawning area;
- b) Fish catchment area;
- c) Ecosystem in the sensitive sea (mangrove, coral reef, and seaweed);

- d) Land allocation;
 - e) Tourism/recreational area.
- 3) Impacts of oil contamination/diffusion in the port and which will come out from the harbor:
- a) Fish breeding and spawning area/fish catchment area including estuaries and communal areas;
 - b) Coastal, tourism and recreational areas;
 - c) Coastal community;
 - d) Coastal forest and land ecosystem.
- 4) Impacts of the lack of unused water supply in the harbor upon the sanitation in the harbor.
- 5) Impacts of the lack of the liquid, soil, gas waste and hazardous and toxic materials management facility to L a) Sanitation in the harbor;
- b) Contamination of coastal resources outside the port:
 - 1) Coastal community;
 - 2) Beach, tourist and recreational area;
 - 3) **Fishery**;
 - 4) Coastal forests and land ecology.
 - c) Human safety and health.
- 6) Impacts of inadequate management of the hazardous and toxic materials in the port such as: explosive and inflammable materials upon:
- a) Contamination to the harbor wastes;
 - b) Security of harbor against fire, explosion and impact of toxicity to the harbor workers.
- 7) Impacts of inadequate management of vehicular traffics from and to the port on:
- a) Local social economy;
 - b) Local air quality (from air contamination);
 - c) Traffic safety.
- 8) Impacts upon local social economy of:
- a) Availability of inadequate residential area (including the slum area hazards);

- b) Inadequate availability of water supply. drainage and facility for the disposal of solid and liquid wastes, including the unfavorable aroma;
 - c) Transfer of agricultural and **fishery** regions;
 - d) Transfer of community;
 - e) Change in land value.
- 9) Impacts of excessive noise from industry at the port on:
- a) Surrounding community;
 - b) Health of port workers.
- 10) Impacts of imperfect health training programs for the port workers to the safety and security due to:
- a) Imperfect management of sanitation waste;
 - b) Inadequate water supply (not guaranteed);
 - c) Inadequate measures for protection against leakage of hazardous and toxic wastes/contamination including toxic and inflammable materials;
 - d) Imperfect protection from excessive noise.
- 11) Impacts of inadequate measures in protecting the shore against the damage resulting from the change of coastal hydrology due to the implementation of port because of:
- a) Erosion;
 - b) Siltation.
- 12) Impacts of imperfect measures in guaranteeing the safety of sailing for the ships entering and leaving the harbor, particularly those causing the oil and toxic hazardous material contamination;
- 13) Damage of the prone region such as nature historical remains, cultural history of the community;
- 14) Other specific matters.
4. Implementation phase of the planned port construction or development activities/project:
- a) Construction Phase
 - 1) The following matters should be described:
 - (a) Schedule for every construction activity;

(b) Method of implementation of activities, particularly those resulting in the sedimentation in the river, noise in the settlement, toxic wastes, unrest in the community;

(c) Collection of materials which may possibly disturb the daily life smoothness and environmental harmony;

(d) Efforts of handling various environmental problems, during the construction period (temporary disturbances at the process of ecology, environmental contamination, smoothness of various living activities of the community.

2) Types of activities which need to be observed are as follows:

(a) Construction of Roads and Bridges, Highways and Railway Tracks in the Port's working environment.

-- Cutting of vegetation, land preparation, excavation or top soil removal and rocks layers in the area and its surroundings where the building will be constructed;

-- Construction of semi-permanent buildings (workers huts), road and temporary bridge, cofferdam, construction for raising heavy equipment and construction of other facilities;

-- Collection of building raw materials (stones, soil, sand, water, etc.);

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Filling activities or reclamation on the area of activity, including the land improvement, pre-loading or installation of sand drains to accelerate the settlement;

-- Implementation of physical activities of construction of roads and bridges in accordance with the applied construction method, including the construction of culverts, installation of piles, etc;

-- Implementation of road asphaltting activities;

-- Operation of heavy equipment required during the construction period;

(The following should also be described: length and width of road and bridges, method of the construction applied, channel crossing mechanism, collection site and distance as well as method of transporting the building raw materials, as well as the site for temporary stockpiling).

(b) Construction of Break Water.

-- Cutting of vegetation and land preparation to make semi-permanent buildings (workers huts) and other infrastructure.

-- Construction of semi permanent building (workers huts), temporary bridge, cofferdam, construction for raising the heavy equipment and construction of other facilities;

-- Collection of building raw materials (stones, soil, etc.);

- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;
- Filling or reclamation activities (water, coast) as well as construction of the break water foundation, including land improvement;
- Operation of heavy equipment and or dredgers during the construction period;
- Implementation of physical activities of the construction of break water in accordance with the applied construction method, such as installation of stones, concrete walls, etc.
- Change of current circulation pattern during the break water construction period.

(The following should also be described: length, width and height of break water, methods of construction and collection of building raw materials applied, site and distance of collection as well as method of transporting the building raw materials, the site for temporary stockpiling).

(c) Construction of the Storehouse for Hazardous and Toxic Materials

- Cutting of vegetation, land preparation, excavation or top soil and rock removal in the area and its surroundings where the storehouse will be constructed;
- Construction of semi-permanent buildings (workers huts) and construction of other infrastructure;
- Collection of building raw materials (stones, soil, sand, water, etc.) from the defined site;
- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;
- Reclamation or filling activities of water and coast;
- Implementation of physical activities of the construction of the warehouse for the hazardous and toxic materials in accordance with the applied construction method, including the installation of piles, etc;
- Operation of heavy equipment required during the construction period;

(The following should also be described: length, width and height as well as type of construction of the building of warehouse for the hazardous and toxic materials, description of the type and category as well as method of transporting the said hazardous and toxic materials, method of transport and the collection site of building raw materials, as well as the site for temporary stockpiling).

(d) Dredging of Shipping lane and Harbor

- Implementation of sand or mud dredging at the site of activities, to reach the expected depth;
- Transport of the products of sand or mud dredging to the final disposal site;
- Disposal of the products of sand or mud dredging in the disposal site;

-- Operation of dredgers used;

(The following should also be described: volume of dredging and the expected depth to reach, type of soil or sand dredged, method of dredging and type of dredgers used, location of the products of dredging (coordinates));

(e) Construction of the Container Terminal

-- Cutting of vegetation, land preparation, excavation or top soil removal and rocks layers on the area where the container terminal will be constructed;

-- Construction of semi-permanent buildings (workers huts) and construction of other infrastructure;

-- Collection of building raw materials (stones, soil, sand, water, etc.);

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Dredging activities of water or coast (harbor) including the land improvement;

-- Activities of filling or reclamation on the site of activities;

-- Implementation of physical activities of the construction of the container terminal in accordance with the applied construction method, including the installation of piles, etc;

-- Operation of heavy equipment and or dredger during the construction period.

(The following should also be described: dimension and type of construction of the container terminal to be built, method of transport and method of collecting the building raw materials applied as well as the site for temporary stockpiling).

(f) Destruction of Rocks

-- Land preparation and construction of semipermanent buildings (workers huts) and construction of other infrastructure;

-- Implementation of rock destruction or explosion activities to be applied, by observing the method of destruction applied and type of explosive used;

-- Operation of heavy equipment or dredgers used during the construction period;

-- Collection and transport as well as disposal of the destructed rocks to the defined disposal site.

(The following should also be described: volume and type of the corral reefs to be exploded, method of destruction applied, type and power of the explosive materials used, disposal site for the destructed rocks).

(g) Construction of Deep Wells

-- Land preparation and construction of semipermanent buildings (workers huts) and other infrastructure;

- Transport of pipe drilling equipment, equipment required and other materials to the drilling site;
- Technical installation and equipment used (pumps, plumbing, etc.);
- Implementation of the drilling activities observing the method of drilling applied;
- Use of chemicals required or used in the drilling process (if required);

(The following should also be described: Location/coordinates and number of wells to be drilled, estimation of capacity/volume and depth of well).

ENFLEX Note: Paragraph (h) does not appear in the original Indonesian decree.

(i) Reclamation Activities

- Construction of semi-permanent buildings (workers huts) and other infrastructure;
- Collection of filling materials;
- Transport of filling materials required (sand, mud) to the reclamation site;
- Implementation of physical activities of reclamation in accordance with the method applied;
- Operation of heavy equipment used during the construction period;
- Operation of dredgers and tug or barges as well as trucks as the transport vehicles.

(The following should also be described: volume of land or sand required, type of soil or sand of reclamation materials, method of reclamation, method of transport and type of dredger used, collection site of sand or mud).

(j) Construction of Pier

- Cutting of vegetation, land preparation, excavation or top soil removal and rock layers on the area where the pier will be built and its surrounding;
- Construction of semi-permanent buildings (workers huts) and construction of other infrastructure;
- Dredging activities of coast or water carried out (if required);
- Collection of building raw materials (stones, soil, sand, water, etc.).
- Transport of building materials from the collection site to the site of activities or temporary collection site;
- Filling or reclamation activities on the activity location area;
- Construction of kistdam (temporary cofferdam) during the construction period;

-- Implementation of physical activities of the construction of the pier in accordance with the applied construction method, including the construction of slope, installation of piles, etc;

-- Operation of heavy equipment and or dredger during the construction period;

(The following should also be described: dimensions of pier to be built, location as well method of transporting the building raw materials applied as well as the method and type of pier construction).

(k) Shifting the River Flow

-- Land preparation to make semi-permanent buildings (workers huts) and other infrastructure;

-- Cutting of vegetation and collection or excavation of soil and rock layers on the planned activity area;

-- sand/mud dredging activities for reclamation materials or filling (if required);

-- Transport of the excavated materials and materials used (soil, sand) from the collection site to the filling site;

-- Operation of heavy equipment, or dredgers during the construction period (if required);

-- Implementation of physical activities of reclamation and filling of materials on the planned activity area;

-- Shifting of river flow pattern or the occurrence of standing water during the construction period;

-- Activities for preparation of land retaining slopes(if required).

(The following should also be described: Collection site for raw materials or materials used, method of reclamation and excavation applied, method of transporting the raw materials, type of heavy equipment and dredgers used.

(l) Construction of Dry bulk Loading/Unloading Facilities in the Port's working environment

-- Cutting of vegetation, land preparation, excavation or top soil removal layer and rocks in the area where the dry bulk loading/unloading facilities will be constructed;

-- Construction of semi-permanent buildings (workers huts) and other infrastructure;

-- Collection of building raw materials (stones, soil, sand, water, etc.);

-- Transport of building raw materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Filling or reclamation activities on the site of activities;

-- Implementation of physical activities of the construction of the dry bulk loading/unloading facilities in accordance with the applied construction method etc;

-- Operation of heavy equipment during the construction period;

-- Implementation of physical activities of technical installation and equipment used, such as plumbing, conveyer, power generation, etc.

(The following should also be described: Collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment to be used, type of dry weight to be unloaded-loaded as well as loading-unloading capacity).

(m) Construction of Facilities for Collection Site and Loading/Unloading of Liquid bulk in the Port's working environment (Tank Farm)

-- Cutting of vegetation, land preparation and excavation or peeling of soil and rock layers on the area where the facilities for the collection site and liquid bulk loading/unloading;

-- construction of semi-permanent buildings (workers huts) and other infrastructure;

-- Collection of building raw materials (stone, soil, sand, water, etc) and other materials required (steel plates, pipes, etc.)

-- Transport of building raw materials and materials from the collection site to the site of activities or temporary stockpiling site;

-- Dredging activities of coast and or water (if required);

-- Filling or reclamation activities in the activity site area (if required);

-- Implementation of physical activities of the construction of the main facilities of collection site (tank farm) and liquid bulk loading/unloading facilities in accordance with the applied construction method;

-- Operation of heavy equipment required during the construction period;

-- Implementation of physical activities of technical installation and equipment used, such as plumbing, conveyer, power generation, pump, etc.

-- Implementation of physical activities of non-main facility construction, such as parking lot, landscaping works, fencing, roads and bridges, drainage, etc.

(The following should also be described: collection site of the raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment used, site and number of tank farms, capacity and type of liquid bulk to be unloaded-loaded).

(n) Construction of Power Generator in the Port's working environment.

-- Cutting of vegetation, land preparation, excavation or top soil and rock removal in the area where the Power Generator will be built;

-- Construction of semi-permanent buildings (workers' huts) for temporary accommodation of workers, and other infrastructure;

-- Collection of building raw materials (stone, soil, sand, water, etc.) and other materials required (steel plates, pipes, etc.);

- Transport of building raw materials and materials from the collection site to the site of activities or to the temporary stockpiling site;
- Dredging activities of coast or water (if required);
- Activities of filling or reclamation on the site of activities (if required);
- Implementation of physical activities of the construction of the facilities of Power Generator in accordance with the applied construction method;
- Operation of heavy equipment required during the construction period;
- Implementation of physical activities of technical installation and equipment used, such as plumbing, power generation, air conditioner, heater, pump, etc;
- Implementation of physical activities of non-main facility construction, such as construction of drainage, waste water channels, parking lot, roads and bridges, etc.

(The following should also be described: collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment to be used, location and capacity of the Power Generator).

(o) Construction of Industries (Plants) in the Port's working environment

- Cutting of vegetation, land preparation, excavation or top soil and rock removal on the area to be built;
- Construction of semi-permanent buildings (workers huts) and other infrastructure;
- Collection of building raw materials (stone, soil, sand, water, etc) and other materials required (steel plate, pipes, etc);
- Transport of building raw materials and materials from the collection site to the site of activities or temporary collection site;
- Dredging activities of coast and or water, as well as building location;
- Filling or reclamation activities on the activity location area (if required);
- Implementation of physical activities of the construction of the main facilities of plant building in accordance with the applied construction method;
- Operation of heavy equipment required during the construction period;
- Implementation of physical activities of the construction of the technical installation and equipment used, such as plumbing, conveyer, power generator, pump, etc;
- Implementation of physical activities of the construction of non-main facilities of plant building, such as construction of drainage, waste water treatment, gas, liquid and solid, roads and parking lot, fences and landscaping works, lighting, etc.

(The following should also be described: collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment used, location and capacity of plant, materials or raw materials as well as production process used).

(p) Construction of dock and ship facilities in the Port's working environment

-- Cutting of vegetation, land preparation, excavation or top soil removal and rock layers on the area where the dock and ship facilities will be built;

-- Construction of semi-permanent buildings (workers huts) and other infrastructure;

-- Construction of protecting building for the temporary building/excavation including crib, cofferdam, etc.

-- Collection of building raw materials (stones, soil, sand, water, etc) and other materials required (steel plates, pipes, etc.);

-- Transport of building raw materials and materials from the collection site to the site of activities or to the temporary stockpiling site;

-- Dredging activities of coast and or water, as well as building location;

-- Activities of filling or reclamation on the site of activities;

-- Implementation of physical activities of the construction of docks and ships in accordance with the applied construction method including the activities of installation of piles, drainage channels, etc.

-- Operation of heavy equipment, or dredgers during the construction period;

-- Implementation of physical activities of technical installation and equipment used, such as power generator, pump, etc;

(The following should also be described: Collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment used, location and capacity of the corresponding facilities of docks and ships).

(q) Construction of Facilities for Waste Disposal and Processing

(r) Construction of Passenger Terminal

-- Cutting of vegetation, land preparation, excavation or top soil removal layer and rocks on the area on which the building will be constructed;

-- Construction of semi-permanent buildings (workers huts) and other infrastructure;

-- Construction of protecting building for the temporary building/excavation including crib, cofferdam, etc;

-- Collection of building raw materials (stones, soil, sand, water, etc.) and other materials required (steel plates, pipes, etc);

- Transport of building materials from the collection site to the site of activities or temporary stockpiling site;
- Dredging activities of coast and or water, as well as location of building;
- Filling or reclamation activities on the site of activities;
- Implementation of physical activities of the construction of facilities of docks and ships in accordance with the applied construction method;
- Operation of heavy equipment and or dredgers required during the construction period;

(The following should also be described: Collection site for raw materials or materials as well as method of transport used, method of reclamation applied, type of heavy equipment to be used, location and capacity of the corresponding facilities of docks and ships).

(s) Construction of other Facilities in the Port Working Area.

b. Post-Construction Phase (Operational)

1) Operation of Roads and Bridges, Highways and Train Rail Tracks in the Port's working environment.

- Rehabilitation of land disturbed or damaged due to the implementation of planned activities;
- Regulation of Traffic of people, goods and vehicles;
- Maintenance and repair activities.

2) Operation of Break Water.

- Rehabilitation of land disturbed or damaged due to the implementation of planned activities;
- Monitoring of circulation patterns of current and wave as well as change of sediment transport characteristics (Abrasion and Accretion);
- Maintenance and repair activities of break water.

3) Operation of Warehouse for Hazardous and Toxic Materials, Warehouse and Filling Yard.

- Rehabilitation of land disturbed or damaged due to the implementation of planned activities;
- Operation entering and exit of goods including the category of hazardous and toxic materials;
- Maintenance and repair activities of the storehouse for hazardous and toxic materials.

4) Dredging the Shipping lane/Harbor

- Change of circulation patterns of current and wave as well as the occurrence of sedimentation and erosion;

- Maintenance of shipping lane and harbor.

5) Construction of the Container Terminal

- Regulation and monitoring of traffic of containers as well as operation of container loading-unloading equipment in the container terminal;

- Operation of container ships while anchored in the harbor water;

- Transport of container ships from/to the hinterland, either through highway or train transport;

- Maintenance and repair activities of container terminal.

6) Destruction of Rocks

- Monitoring after the change of circulation patterns of currents and waves after the construction period as well as the change in the sediment transport mechanism.

7) Construction of Deep Wells

- Change of surface depth and quality of ground water.

8) Reclamation Activities

- Change of circulation patterns of currents and waves after the construction period as well as possible changes to the sediment transport mechanism.

- Monitoring of the decreased land surface.

9) Construction of Piers

- Regulation and monitoring the current and traffic of ships and its operation in the water of port working area;

- Change of circulation patterns of current and wave after the construction period as well as possible occurrence of sedimentation;

- Monitoring of loading/unloading activities;

- Maintenance and repair activities of pier.

10) Rerouting of Rivers

- Rehabilitation and reclamation of land disturbed or damaged due to the implementation of planned activities;

- Change of debit and river flow pattern as well possible sedimentation.

11) Operation of Dry bulk Loading/Unloading Facilities in the Port's working environment

-- Loading-unloading activities and operation of dry bulk loading-unloading equipment (conveyor, etc.)

-- Operation of dry bulk ships during docking and anchoring in the harbor water;

-- Transport of dry bulk from/to the hinterland, either through highway or train transport;

-- Maintenance and repair activities for dry bulk loading-unloading facilities;

12) Construction of Facilities for Collection Site and Loading/Unloading of Liquid bulk in the Port's working environment (Tank Farm)

-- Loading-unloading activities and operation of liquid bulk loading unloading equipment;

-- Operation of liquid bulk ships while anchored in the harbor water;

-- Transport of liquid bulk from/to the hinterland, either by road or by rail;

-- Maintenance and repair activities of liquid bulk loading unloading facilities;

-- Possible pipe rupture, leak and explosion as well as fire in the tank farm;

-- Tank rinsing with or without chemicals as well as the disposal method of liquid bulk dirt.

13) Construction of Power Generator in the Port's working environment.

-- Transport of fuel and fuel handling system;

-- Operation of combustion (boiler) system, exhaust gas, cooling system, boiler water processing system and consumption water, liquid and ash waste disposal system;

-- Maintenance and repair activities;

-- Control of exhaust gas emission.

14) Operation of Industries (Plants) in the Port's working environment

-- Transport of fuel and material input (raw materials) as well as auxiliary materials used as well as the system of handling;

-- Technology and process of production applied as well as operation of the liquid, gas or solid waste disposal system;

-- Characteristics of material and raw materials used according to the physical, mechanical, chemical, electrical or magnetic properties;

-- Maintenance and repair activities of the industrial (plant) facilities and installations.

15) Construction of Dock and ship facilities in the Port's working environment

- Implementation of docking works or production of ships in the corresponding docking facilities as well as welding works;
- Operation of heavy equipment required in the docking works;
- Possible petroleum, oil spillage or ballast water disposal in the implementation of docking works;
- Maintenance and repair activities of docking facilities and ships.

16) Operation of Waste Disposal and Processing Facilities

- Liquid waste monitoring and processing;
- Solid waste monitoring and processing.

17) Operation of Passenger Terminal.

- Monitoring of passengers and services;
- Operation of passenger ship in the harbor.

Chapter III. Environmental Characteristics when the Study is Conducted

In this chapter, environmental information should be presented as completely as possible, regarding:

1. Environmental characteristics existing in the site of activities, inside and in the vicinity of port's working environment, determine also the appropriate distance of the site activities of port development when such activities are carried out.

Environmental components having significant meaning should necessarily receive specific attention such as rare wild animals, archeological remains, environmental characteristics with famous nature beauty, disputed land, as well as socio economic and social cultural conditions of the community etc.

2. Qualitative and quantitative conditions from various natural resources existing in the vicinity of the site of activities and port development, either those which have been and will be utilized or those which are not yet in potential form.

Presentation of these natural resource conditions should necessarily be stated in the maps having adequate scales and if necessary it must be equipped with the diagrams, figures, graphics or pictures.

3. Data and information of initial environmental characteristics at the initial period of Environmental Evaluation Study (SEL) is carried out, shall comprise:

a. Climate and Air Quality

- 1) Climate components: type, air temperature (maximum, minimum, average), air humidity (average), radiation duration and solar intensity (average), cloud covering (average), air pressure (average), wind (wind direction, highest velocity in one month and average velocity), rainfall (rainfall and number of rainy days) and evaporation.

- 2) Periodical data of disasters (annual cycle, every five years, etc.) such as the hurricane in the location of planned port construction and development activities/project;
- 3) Air quality (ambient and emission) in the location of the planned activities, inside and in the vicinity of the port's working environment;
- 4) Distribution pattern of air contamination materials, in general and in the worst weather condition;
- 5) Sources of noise and vibration, noise and vibration level as well as its period of occurrence.

b. Physiography

- 1) Topography of land form (morphology) in the port's working environment and seismic information in the location of planned activities and the surroundings.
- 2) Type of soil, soil characteristics and physics (depth of land, texture, structure, porosity, permeability, specific weight and color).
- 3) Uniqueness, particularity and proneness of landscape and form of land as well rock geologically.

c. Hydrology and Water Quality

- 1) Physical characteristics of rivers, swamps;
- 2) Average debit, monthly and annual (flood and puddle);
- 3) Sedimentation content (mud) and erosion level;
- 4) Fluctuation and potential of ground water (shallow and deep);
- 5) Water provision and requirement/utilization level for drinking water, industrial requirement, etc.
- 6) Quality of physical, chemical, and microbiological properties of water such as: temperature, dissolved oxygen content, mineral content etc in accordance with the passing season;
- 7) If there is heavy metal in water, heavy metal content in the sediment should necessarily be examined.

d. Hydroceanography and Limnology 1) Marine hydrodynamic pattern such as low tide, current and wave.

This marine hydrodynamic pattern should also include the information on: magnitude, velocity, length, breadth, frequency of wave, magnitude and frequency of tidal wave (tsunami), current circulation patterns, etc.

- 2) Coastal interaction (sedimentation or abrasion) and interaction with weather;

- 3) Quality of water in regards of physical, chemical, microbiological of water, heavy metal and other contaminants;
- 4) Condition and process of physical oceanography and limnology or fluviology.

This information must be completed with the maps with adequate scales.

e. Space, Land and Soil

- 1) Inventory of the use of soil or land and other resources in the port and their possible potential in the future in the site of activities of port construction and development;
- 2) Regional development plans, layout plans, plans for land use and other natural resources which are officially or non officially, prepared by the local Government at the Regency, Provincial or National levels at the location of the port activities and its surroundings.
- 3) Possible conflict or limitations which occurs between the plans of layout, land use and other natural resources presently prevailing with the presence of ownership/determination of location for the port activities;
- 4) Inventory of historical remains (biology, geology and archaeology) at the location of port and its surroundings which are estimated to require protection.
- 5) Inventory of aesthetic value and landscape beauty as well as the recreational regions existing at the location of port and its surroundings.

f. Flora and Fauna

1) Flora

- a) Natural vegetation in the location of the port activities. If there is still a natural community of tropical plants, the composition and structure of the plant community as well as its maturation level must be described;
- b) Description of various plant communities located in the location of port activities and its surroundings, either in the environment which is still natural or developed by human beings (land and water forests, plants, plantation, coastal ponds, cultivation, etc.);
- c) Description of the community of unique, undisturbed plants, because they have historical values (natural and cultural), landscape beauty and recreation as well as specific economic and ecological values;
- d) Description of the community of plants in the water zone including its unique habitat.

2) Fauna

- a) Estimation of distribution, pattern of migration, population density of animals (amphibians, reptile, birds, mammals, etc);
- b) Estimation of distribution and population density of invertebrata and insects which are considered important, because they have roles and potential as food materials or sources of pests and disease and types of animals in number (1) above.

List of invertebrate animals together with their roles should also be arranged systematically.

Water zones should also be complete with data and information on: estimation of population density of animals (plankton, fish, benthos, nectos, water bacteria) as well types of coral reefs.

c) Habitat of important animals which may possibly be affected by and subject to the negative impacts due to the planned port activities.

Flora and fauna survey boundaries shall be limited inside and in the vicinity of the port activities and can be extended as long as they still have relation with the planned port development.

g. Social Cultural and Social Economic Aspects 1) Environmental characteristics of social culture and social economy of the community in the location of the port activities and its surrounding, shall include among others:

a) Conditions of the activity center of economy, infrastructure, means of livelihood, and income as well as applicable formal and informal taxation system;

b) Population structural conditions, including the population number, heterogeneity of population, as well as the existing population pattern, structure of age, proportion in accordance with the sex, education, health, belief, heterogeneity of the prevailing values and norms;

c) Daily living, customs, manners, intra and inter community group interaction, system of belief, heterogeneity of and prevailing norms;

d) Attitudes, values, and perception of various community groups in regards of their environments and their group life;

e) Distribution of power, prevailing social stratification and vertical and horizontal mobility systems, differentiation, and diversification in the community;

f) Integration and cohesion of various community groups;

g) Conditions of institutional order in the community, either traditional or modern;

h) Relation with other region or location from various community groups;

i) Experience level with social change, contact with other culture, and adaptation methods carried out;

j) Social cultural facilities which possibly located in the local community environment;

k) Historical cultural remains which may possibly affected by the impacts due to the presence of the port activities;

l) Social problems existing in the community as well as the method of handling them;

n) Conditions of facilities and health of the community in the vicinity;

o) Other matters considered important.

2) Description of the need of settlement for the workers for the port activities and possible growth of unauthorized settlement (not planned by the initiator and local government) due to the presence of job opportunity directly or indirectly resulting from the port activities;

3) Description of the attitudes and responses of local community to the possibility for the implementation of the port activities in the vicinity of their residence, which will result in various impacts (the flowing of workers from outside region, investment, working opportunity, new life activity pattern, etc):

4) Description on the mutual relation between the present community activities and future community activities if the port activities, particularly in the analysis of possible presence of the relation which:

a) is mutually supporting;

b) results in conflict;

c) has not any association with the community activities before and after the port activities.

Chapter IV. Estimation of Significant Impacts which Exist and which may Possibly Emerge

In this chapter, the following should be contained:

1. Discussion of significant impacts which exist and may possibly emerge due to various activity components in the port development activities (which have been in progress), both positive and negative impacts.

This discussion must be based on the data and information obtained in the field (secondary and primary data), and must cover possible short-term and long-term impacts, either during the construction and post-construction of the port development planned activities.

If the factual data and information is not available, or not reliable, the report needs to explicitly state that such estimation of significant impacts is based on subjective considerations, because there are discrepancies in data and information.

2. Categorization of significant impacts due to the presence of these port development activities shall be classified into direct and indirect impacts. Direct impacts are those directly resulted from the presence of port development activities.

While indirect impacts are those resulted from the secondary activities induced by the presence of activities/project of port construction and development.

This category shall be valid for all potential direct impacts, which may result from the presence of port development activities and other activities it induces.

3. Directions for several topics as follows:

a. Climate and Air Quality -- Potential of significant impacts from the activities/project of port construction and development which have resulted and will result in the change of micro climate and air quality and disturbances in the form of noise and vibration must be described in detail.

b. Physiography -- Potential of significant impacts from the port development activities on:

- 1) Slope stability, landslide (erosion due to the presence of land for the benefit of the activities of excavation, dredging, etc);
- 2) Form or properties and unique nature of the land as well as the change of land appearance and convenience;
- 3) Change/modification of land due to excavation, filling of soil or sand, collection of raw materials (stones, lime, sand, etc) or waste disposal in form of filling.

c. Hydrology and Water Quality -- Potential of significant impacts from the port development activities/project to:

- 1) Disturbances to river flow and change of the surface and body of water (swamp, water, etc);
- 2) Change of flow direction of the river flow pattern including the addition of water volume;
- 3) Change of the depth of water zone;
- 4) Magnitude of flood as well as destructive effects;
- 5) Formation of standing water;
- 6) Quality of surface water and sedimentation, turbidity level, dirt because of garbage and dirt, contamination by hazardous and toxic materials, etc.
- 7) Quality of ground water including sea water intrusion.

d. Hydrooceanography -- Potential of significant impacts from the port development activities to:

- 1) Change the physical, chemical, and microbiological quality/properties of sea water;
- 2) Change to the marine hydrodynamic pattern (current direction, waves and tides);
- 3) Change of sedimentation pattern and coast erosion;
- 4) Quality of waterway in regards of physical, chemical properties and water microbiology, heavy metal content and other contaminants oil film, organohalogen substance, mercury substance and mercury, cadmium substance and cadmium, radioactive waste, arsenic, lead and its mixtures, copper, zinc, organosilicone mixtures, cyanide, fluoride, pesticide, beryllium, chromium, nickel substance and nickel, vanadium, etc. in accordance with the passing season;
- 5) Condition and process of physical oceanography and limnology or fluviology.

e. Layout Potential of significant impacts from the port development activities development to:

- 1) Change, limit, or create disputes in the use and utilization of land, water and other natural resources due to the planned activities;

- 2) Change of natural beauty and loss of opportunity to enjoy the aesthetical and recreative sources because of oil spillage, turbidity, dirt and garbage, liquid or solid waste, hazardous and toxic materials;
- 3) Land having natural historical remains, unique ecosystem which should be maintained;
- 4) Planning for regional development, layout and use of land, other resources which have been legalized by the local government.

f. Flora and Fauna

- 1) Flora Potential of significant impacts from the port development activities to:
 - a) Change and cause loss as well as damage of plant community at the location of the planned activities and its surroundings;
 - b) Sensitive plant communities and protection forest (such as mangrove along the beach and the vicinity), together with wild animals found in it;
 - c) Damage of plants useful for the benefits of economy and ecology of human being due to the petroleum and or oil spillage or leakage and or oil, turbidity, dirt and garbage, liquid or solid waste, or other hazardous and toxic materials;
 - d) Green belts separating zones from important development zone shall be preserved and maintained.
- 2) Fauna Potential of significant impacts from the activities of port development to:
 - a) Migration pattern of animals (fish, invertebrate, amphibians, reptile, mammals, plankton, benthos, and necton), location to find foods, place of hatching, place of spawning etc. from various types of the corresponding animals);
 - b) Place of meeting, territorial region of animals, fish, birds etc;
 - c) Death of animals, fish, etc. due to petroleum and or oil spillage or leakage, or lubricating oil, liquid or solid waste, turbidity, garbage and dirt or due to the use of hazardous and toxic materials in the planned activities;
 - d) Extinction of animals or rare fish;
 - e) Disturbances in form of expulsion, noise to the wild animals.

g. Social Economic and Social Cultural Aspects -- Potential of significant impacts from the proposals of activities and port development to:

- 1) Conditions of the center of economic and tourism activities, infrastructure, means of livelihood (decreasing **fishery** production, etc) and earnings of residents;
- 2) Structural condition of residents, including the number, density, heterogeneity of population as well as earnings of residents;
- 3) Daily life, customs, manners, intra and inter community group interaction, system of belief, heterogeneity of values and norms;

- 4) Attitudes, values, and perception of various community groups in regards of their environments and plans for transferring and distributing the residents (among others, unrest of residents);
- 5) Distribution of power, social stratification system and difference and diversification in the community;
- 6) Integration and cohesion of various community groups;
- 7) Conditions of institutional order in the community;
- 8) Relation with region or location from various community groups;
- 9) Change, disturbances, damage of historical cultural remains which should be preserved;
- 10) Condition and order of power system;
- 11) Speculation in land price;
- 12) Condition of facilities and health as well as the security of the surrounding community;
- 13) Use of workers both from inside and outside in the surrounding location of planned activities.

Chapter V. Evaluation of Significant Impacts

In this chapter the following shall be described:

1. Causative relations between the activities of port development (which is in progress) and environmental characteristics with positive and negative impacts which may emerge, at the location of activities, inside and in the vicinity of the port's working environment.

It is possible that significant impacts emerge from the activities on the environmental characteristics, because such activities are carried out in a location which is too heavily populated, or at an income and education level which is too low, using inappropriate technology, etc.

2. The nature of these significant impacts needs to be clearly stated, namely whether the significant impacts, either positive or negative, will continuously persist as long as such activities are taking place or if there will be antagonistic or synergistic mutual relations between one impact and other impact.

If possible it is also necessary to describe when the limit threshold of these significant impacts will begin to emerge after these activities are carried out or will continue to persist after the construction period and end with the completion of the activities. Or if they will continue, for example for more than one generation.

3. Community groups which will be affected by negative impacts and those by positive impacts.

Identification of discrepancy between the changes expected and those which may occur due to development activities.

4. Possible areas which will be affected the significant impacts, whether the latter can only be felt locally, regionally, nationally or even internationally, crossing the boundaries of the state of the Republic of Indonesia. Therefore, it is necessary to describe also the controlling proposal viewed from government capacity level aspects of overcoming the negative impacts and developing positive impacts at the district, regency, provincial levels, central government or between states.

5. Alternative approaches in controlling negative impacts and development of positive impacts should comprise:

a. Measures for Handling of Impacts which have been carried out:

1) Economic Approach -- Description of the magnitude of government assistance which has been provided to handle environmental problems which emerge and will emerge.

2) Technological Approach -- Description on how far the current technological capacity which has been used, is capable of limiting, isolating contamination, such as by hazardous and toxic materials etc.

3) Institutional Approach -- Description on how far the cooperation of various parties in the integrated environmental management measures, which will also include the handling of environmental problems.

b. Handling of Impacts can be carried out by means of:

1) Economic Approach -- For example through the development of incentive and disintensive systems in economic fields, or assistance from the government to participate in handling the environmental problems.

2) Technological Approach -- For example by means of limiting, isolating or neutralizing the types of hazardous and toxic materials. Or by means of changing the process to prevent or reduce the volume of the existing effluent or possibly also by means of recycling the wastes/effluent.

3) Institutional Approach -- For example by means of enlarging the management system so that matters in regards of the handling of environmental problems shall also be included in it. Or by encouraging the cooperation with various parties to improve supervision.

If it is still possible, by means of re-planning the zoning system hence the distance between the source of contamination and residents should be considered.

Of course, the approach in controlling negative impacts and development of positive impacts may be optional or may also constitute a combination required either in simultaneous or sequential period.

6. Description of the alternative for environmental management and monitoring at the site of activities, inside and in the vicinity of port's working environment, if the planned activities have been materialized.

In this description, the following matters should be included:

a. The start of environmental management and monitoring programs and their frequency.

- b. Environmental management and monitoring method comprising not only biogeophysical-chemical factors, but also the social economic and social cultural aspects.
 - c. Utilization of the results of environmental management and monitoring as feedback for the improvement of environmental control systems into, or outside the planned activity boundaries.
7. Analysis of disasters and analysis of risks if the planned activities are in the region of natural disaster or near the source of natural disaster.

Chapter VI. Bibliography

In this chapter, sources of data and other information which have been used should be stated such as books, magazines, papers, articles, and other media organized as follows:

1. Name of author or name of editor, either in name of person or name of institution.
2. Year of Publication of book, magazine, paper, article, and other media.
3. Publisher of book, magazine, paper, article, and other media.
4. Place of publication of book, magazine, paper, article, and other media.

Chapter VII. Attachments

The attached materials should be mentioned in this chapter.

1. Approval Letter of the Central Commission for AMDALHUB/Regional Commission or recommendation which has been obtained by the Initiator up to the time when the Environmental Impact Analysis (ANDAL) is made.
2. Letters of recognition, decision, qualification, reference for the implementing persons and researchers as well as the preparer of THE Environmental Impact Analysis (ANDAL).
3. Pictures (black and white or color) which can illustrate the environmental characteristics, proposal of activities thus providing a deeper understanding the mutual relation as well as to allow for the significant impacts to result.
4. Diagrams, maps, figures, graphics, and tables which can support all description stated by sources, if they are truly cited or taken from certain bibliographical materials.
5. Other matters deemed necessary or relevant to be included in these annexes.

Chapter VIII. Biodata of the Producer of Environmental Evaluation Study (SEL) SEL

Producer must have expertise in the required discipline of knowledge and possess the basic qualification of AMDAL A or B.

Minister of Transport

Ir. Azwar Anas

