Draft Environmental Management Plan

People's Committee of Hai Phong
Project Management Unit of Urban Upgrading Project

Vietnam Urban Upgrading Project
Hai Phong Sub-Project
Draft Environmental Management Plan

67030419

September 2003

People's Committee of Haiphong
Project Management Unit of Urban Upgrading Project

Vietnam Urban Upgrading Project Sanitation
Haiphong Sub-Project
Preface

The Government of Vietnam has received a grant from World Bank for the implementation of the Vietnam Urban Upgrading Project (VUUP) with the aims to upgrade low-income communities in Haiphong, Ho Chi Minh City, Can Tho and Nam Dinh. The VUUP will provide basic infrastructure and services improvements to low-income communities and a part of critical primary and secondary infrastructure related to the low-income communities.

The Draft Environmental Management Plan for Vietnam Urban Upgrading Project – Haiphong Sub-Project, Phase I has been prepared based on the information and data available in September 2003, when the Feasibility Studies were not approved, yet. Some of the latest information was available only in Vietnamese. All the information and data will be checked and updated during the preparation of Final Environmental Management Plan Report.
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Drawing 8 LIAs in Cat Bi and May Chai ward in Ngo Nguyen District

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List of Abbreviations

Organisations
MOC Ministry of Construction
MOF Ministry of Finance
MPI Ministry of Planning and Investment
MONRE Ministry of Natural Resources and Environment
NEA National Environmental Agency
MOSTE Ministry of Science, Technology and Environment
DOSTE Department of Science, Technology and Environment
MOST Ministry of Science and Technology
CMS Consulting Management Services
PMU Project Management Unit
TUPWS Transportation and Urban Public Works Service
VUUP Vietnam Urban Upgrading Project
WB, the Bank The World Bank
FIDIC Federation Internationale des Ingenieurs-Conseil

Other
BOLUG Building Ownership and Land Use Certificate
EIA Environmental Impact Assessment
EMP Environmental Management Plan
CEMP Community Environmental Management Plan
CUP Community Upgrading Plan
LIA Low-income Area
PIP Project Implementation Plan
RAP Resettlement Action Plan
TA Technical Assistance
O&M Operation and Maintenance
Phuong ward

September 2003
Summary

Introduction

The Vietnam Urban Upgrading Project (VUUP) aims to upgrade low-income communities in four cities, namely Ho Chi Minh, Hai Phong, Nam Dinh, and Can Tho. The VUUP will provide basic infrastructure and services improvements (referred to as tertiary infrastructure) to low-income communities already identified in the cities. To ensure that the tertiary infrastructure provided is able to operate effectively and to its optimum, critical primary and secondary infrastructure (referred to as trunk infrastructure) is also to be provided as part of the VUUP.

According to the Terms of Reference for Phase I of Vietnam Urban Upgrading Project - Haiphong Sub-Project the EIA Consultant will prepare Environmental Impact Assessment (EIA) documentation including Environmental Management Plan that corresponds to the requirements of the Government of Vietnam and the World Bank safeguard policies OP 4.01 on Environmental Assessment and OP 4.11 on Physical Cultural Resources where the concerns of impacts on cultural structures are triggered.

Objectives and Principles

The objectives of Haiphong Sub-Project, as well as the objectives of the Vietnam Urban Upgrading Project in general, are as follows:

- Alleviate poverty in urban areas by improving the living and environmental conditions of the urban poor
- Promote the participatory planning methods for urban upgrading to meet the people's demand
- Use multi-sector approach with communities' consultation in implementation process of upgrading programs.

The most important principle of the project is to active community participation in all stages of preparation, design and implementation processes. The residents, who are living in the project area, will have the right to participate in and benefit from the project as well as contribute to the upgrading works.

Scope of the Project

The project will be implemented in two phases. Phase 1 of the project will be carried out in 8 low-income areas (20 residential areas) belonging to 8 wards of five districts of the city as follows: Du Hang Kenh ward in An Hai district (3 LIAs); Trang Minh ward in Kien An district (3 LIAs); Trai Chuoi ward in Hong Bang district (1 LIA); (Niem Nghia ward in Le Chan district (3 LIAs); Tran Nguyen Han and Cat Bi ward in Le Chan district (1 LIA); Cat Dai and May Den wards in Ngo Quyen district (4 LIAs).

There are totally six components in the whole project as follows. Draft Environmental Management Plan has been done for Components 1 and 3.
Location of the Project

The location of Component 1 (Tertiary infrastructure), Component 2 (Primary and secondary technical infrastructure) and Component 3 (Housing for the poor) is presented in Drawing 2 and 3. Location of low-income areas (LIAs) in eight wards in five districts is presented in Drawings 4 – 8.

Environmental Impacts

Upgrading of tertiary infrastructure will reduce poverty in the low-income areas in Haiphong by improving infrastructure and basic services and thus providing better environment for the poor people.

Primary and secondary infrastructure will focus on rehabilitation of An Kim Hai Channel, which has many impacts on environmental pollution and landscape of the city. The upgrading works will improve significantly the environment of the area and the city as a whole. The environmental mitigation measures and management will be strictly required during construction and operation phase to reduce adverse impacts on environment and deteriorating landscape. These actions will also improve investment effectiveness on regional and city level.

Existing environmental conditions fail to achieve the environmental quality standards required by the Government policy and legislation. In order to achieve the long-term benefits, the project is expected to generate short-term adverse impacts, particularly during the construction phase due to the proposed scale of the investment. However, the majority of adverse construction phase impacts can be mitigated through:

- The incorporation of appropriate contract conditions that define operating procedures to be adopted by contractors
- Maintaining an effective consultation process that ensures effective participation of community (primary stakeholder) level in implementing the Community Environmental Management Plan (CEMP) and Environmental Management Plan (EMP)
- Ensuring the project management framework provides coherent decision making about defined actions in the event of non-compliance

Almost 26,000 residents in eight LIAs in Phase 1 can get direct socio-economic and environmental benefits through provision of public utilities, services and infrastructure. The number of indirect beneficiaries in the surrounding areas is estimated to be 7,500.

Mitigation Measures

Environmental Management Plan consists of mitigation, monitoring and institutional measures to be taken during design, construction and operation phases to eliminate adverse environmental and social impacts, offset them or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures.
The EMP helps to ensure that the proposed environmental actions in the EIA are in phase with the design and rehabilitation work. After discussing and agreeing with the project design engineers, the recommendations have been translated into a practical and action oriented EMP.

Environmental matters have to be integrated in all the design work and planning of the project. The design of the different project components will be carried out taking into consideration relevant environmental standards and minimising adverse environmental impacts on human and biophysical environment by appropriate planning and design. The designing has to be done by minimising the adverse impacts on environment using as much as possible existing facilities and selecting the location of new facilities in areas where the disturbance to environment, people and existing structures is the smallest. Where possible existing rights-of-way has to be used rather than create new ones.

All construction works including to the project will be implemented following the appropriate standards, specifications and working methods. The Contractor has to implement mitigation measures described in EMP and Contract Documents.

Communities and the concerning companies have responsibility to carry out all operation and maintenance work using proper methods and avoiding noise, odour, litter, dust, and traffic nuisance during the operation. The same health and safety instructions as during the construction phase have to be followed also during operation phase when cleaning of sewers and channel and lake dredging.

**Summary of Mitigation Measures**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Main mitigation measures</th>
<th>Responsible organisation</th>
</tr>
</thead>
</table>
| Design | - International and Vietnamese design criteria and standards to be used  
       - Drainage and widening of alleys designed so that need for resettlement is minimised  
       - Works designed to implemented during dry season | Design  
       Consultant  
       Design  
       Consultant |
| Construction | - Minimise dust, odour, litter, noise and traffic emissions by good operation management and site supervision  
               - Appropriate working methods have to be followed  
               - Sites have to be kept clean and safe during and after the work  
               - Safety and health regulations has to be strictly followed  
               - Transportation has to be minimised and routes selected to avoid public nuisance  
               - Transportation during rush hours and night has to be avoided  
               - Tight and proper equipment to transport sediment and garbage has to be used to avoid accidental spills and odour nuisances  
               - Construction sites and time has to be informed to the local people in advance | Contractor  
               Contractor  
               Contractor  
               Contractor  
               Contractor  
               Contractor  
               Contractor  
               Contractor  
               PMU  
               PMU  
               Communities |
| O&M | - Follow Project Operations Manual, CUPs, CEMP and EMP  
       - Minimise dust, odour, litter, noise and traffic emissions by good operation and maintenance supervision  
       - Appropriate working methods have to be followed  
       - Immediate preparation of breakages | PMU  
       PMU  
       PMU  
       Communities |

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Summary of Present Monitoring

Summary of the proposed monitoring programme of the whole Vietnam: Three Cities Sanitation Project – Haiphong Sub-Project including sludge and septage monitoring in Trang Cat disposal site is presented in Table below.

Summary of Monitoring Programmes of Vietnam: Three Cities Sanitation Project - Haiphong Sub-Project

<table>
<thead>
<tr>
<th>Type of monitoring</th>
<th>Number of samples</th>
<th>Frequency / Phase</th>
<th>Needed equipment</th>
<th>Responsible organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety during construction</td>
<td>Lot</td>
<td>During the work / Construction</td>
<td></td>
<td>Contractor</td>
</tr>
<tr>
<td>Safety during operation</td>
<td>Lot</td>
<td>During the work / operation</td>
<td>Gas detector Decibel meter</td>
<td>SADCo</td>
</tr>
<tr>
<td>Lake and channel</td>
<td>4 in lakes 6 in channels</td>
<td>2 / year operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Sludge</td>
<td>1 raw sludge 1 treated</td>
<td>2 / year operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Leachate</td>
<td>1 from pond 1 effluent</td>
<td>1 / month operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Groundwater in Trang Cat</td>
<td>Borehole</td>
<td>2 / year operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Hydrological Monitoring</td>
<td>Lot</td>
<td>1 / day during dry season / operation 1 / hour during rainy season / operation</td>
<td>Water level gauges</td>
<td>SADCo</td>
</tr>
</tbody>
</table>

The proposal to follow and monitor the Project in the communities is according to the Data for Environmental Impact Assessment and CUPs as follows:

Environmental monitoring during construction

<table>
<thead>
<tr>
<th>Upgrading activities</th>
<th>What to monitor</th>
<th>How often</th>
<th>How</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply</td>
<td>Excavated soil</td>
<td>Twice a week</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Roads</td>
<td>Dust</td>
<td>Every day</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>At night time</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Drainage</td>
<td>Excavated soil</td>
<td>Every day</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>At night time</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Sludge dredging</td>
<td>Sludge</td>
<td>2 days</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>District officer</td>
<td>2 days</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>District officer</td>
<td>2 weeks</td>
<td>Inspection</td>
<td>URENCO</td>
</tr>
</tbody>
</table>
Environmental monitoring during operation

<table>
<thead>
<tr>
<th>Upgrading activities</th>
<th>What to monitor</th>
<th>How often</th>
<th>How</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply</td>
<td>Quality</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td>Drainage</td>
<td>Sediment</td>
<td>6 month</td>
<td>Checking</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Clogging</td>
<td>Every week</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Solid waste</td>
<td>Condition around</td>
<td>Every day</td>
<td>Observation</td>
<td>Households nearby</td>
</tr>
<tr>
<td></td>
<td>Transfer site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transport</td>
<td>2 days</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Disposal site</td>
<td>year</td>
<td>Inspection</td>
<td>URENCO</td>
</tr>
<tr>
<td>Air quality</td>
<td>Odour</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td></td>
<td>Smoke</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td></td>
<td>Dust</td>
<td>3 month</td>
<td>Measuring</td>
<td>District officer</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>3 month</td>
<td>Measuring</td>
<td>District officer</td>
</tr>
</tbody>
</table>

It is recommended to include sampling points from An Kim Channel to the existing environmental monitoring programme of SADCo.

The more detailed monitoring programme will be presented in the Final Environmental Impact Assessment Report after the discussion with PMU, communities and SADCo.

Implementation organization

It is proposed that project owner, Project Management Unit (PMU), directly manages project implementation process at city level. To support and steer the PMU it is required to set up the Project Steering Unit under Haiphong People’s Committee.

It is essential to strengthen the capacity of PMU staff by recruiting experts who have experiences in procurement, bidding, project management and especially financial management. The PMU may also need additional support from international consultants to ensure that the project will be implemented favourably.

Financial Management system (FMS) need be applied for PMU. The PMU has to establish FMS that is satisfactory to the WB. This will include the items listed below:

- Professionally qualified and appropriately experienced chief accountant (satisfactory to WB’s requirements)
- Project FMS manual
- Computerized accounting system with which staff is familiar (hardware, software and training may be needed)
- Reporting system that can provide quarterly project management reports that meet the Bank’s reporting requirements.
- Appointment of an independent auditor to prepare annual audits of the project accounts

September 2003
The structure of project management and steering organization

Haiphong City Steering Committee

World Bank Group

Haiphong People's Committee

Project Management Unit

Primary & Secondary infrastructure

Tertiary infrastructure

Security of tenure

Revolving fund for housing improvement

Researching institutional & policy issues

Self control group

Monitoring group

Cash collection group

Ward/commune's people's committee

Ward/commune's project group

Planning group

Community

Structure of Project Implementation Organisation on Community Level

HAIPHONG CITY URBAN UPGRADE PROJECT MANAGEMENT UNIT

PROJECT MANAGEMENT PARTS

TERTIARY INFRASTRUCTURE UPGRADE GROUPS IN WARDS AND COMMUNES

WARD, COMMUNES PEOPLE'S COMMITTEE

PLANNING GROUPS

COMMUNITIES

SELF-MANAGEMENT GROUP

MONITORING GROUP

CASH COLLECTION GROUP

September 2003
Relationship and responsibilities of relevant departments and agencies

The Government of Vietnam will be responsible for receiving fund from the World Bank in the framework of Vietnam Urban Upgrading Project and approve Pre Feasibility Study report of Vietnam Urban Upgrading Project - Haiphong Sub-project and investment allowance.

The World Bank Group in Viet Nam will finance the project through signed agreements; appraise proposals of project on technical and financial aspects and give no-objection letter; review and give no-objection to the invitation for bidding contract packages, and provide and suggest contents of the project.

Haiphong People’s Committee will manage Vietnam Urban Upgrading - Haiphong Sub-project; approve feasibility study report and total cost estimates; approve engineering designs and cost estimates of components; decide to set up project steering unit and project management unit; decide investment; mobilize state capital sources including local funds and fund contributed by people to project proportionally divide responsibility for all works of Haiphong sub-project on the behalf of the Government; and provide documents and figures related to project.

People’s Committee of Districts, Wards and Communes related to the project will manage project’s works in relation with each local area and be responsible for those works with superior People’s Committee; support, create good conditions for relevant units and departments to implement works of the project; take over and manage construction components after construction of the project in accordance of committed responsibility; and mobilize contributed funds from households in low-income areas for project’s expenditure.

Planning Group in low-income areas will be in charge of Community for project’s works related to low-income areas; and participate in planning and guiding communities to contribute ideas to the contents of community upgrading plan and other works of project.

Project management unit (PMU) is Project owner (Part A) under the direct management of Haiphong People’s Committee, and is responsible for all works related to project such as preparation, engineering design, construction, preparing balance-sheet, inauguration, transferring to other units; and contact with concerned parts in works of project.

Low-income communities will be direct beneficiary from project; and be responsible for participating to project through following works: consult for plans of project, contribute to project by cash and other means, and take part in managing and operation and maintenance after construction.

Non-government organizations at all levels on behalf of communities, they should be responsible for supporting communities in relevant works of project in their area and locality based on their experiences and prestige.
Environmental Training courses for PMUs

Part I: Prepare reports on the environmental status quo

- Introduction including the preparation of reports; target, specific characteristics, and principles to prepare reports on the environmental status
- Institutional considerations
- Establish database for the preparation of the Report of Environmental Status Quo including the data subject, database development, spatial data, and construction of the environmental information system.
- Environmental instructions
- Environmental status quo when carrying out the project

Part 2: Environmental Impact Assessment (EIA)

- Overviews of EIA including the birth, necessity, objects, contents and requirements of EIA
- Implementation process of EIA: including the preparation, appraisal and implementation process of EIA in Viet Nam
- Impact evaluation towards environmental elements: including elements as air, soil, water, noise, biological environment, solid waste, cultural and socio-economic environment
- Technical approaches of EIA
- Socio-economic angle of EIA
- EIA for a project: for example the rails and roads’ construction project and new urban construction project of the main point economic area
- Stipulation and guidance on EIA of international organizations: including 10 safe policies of the WB and guidance of EIA of other international organizations

Environmental Training courses for communities

Contents of the training course are similar but simpler than the training course for PMUs.

Part I: Preparation of EIA report – also having items 1, 4, 5 (introduction, instructions and situation) but no having item 3 (data base establishment) and in item 2: reducing the “planning” and “task” section.

Part 2: Impact Evaluation on environment – also having items 1, 3 (overviews, evaluation) but no having items 2, 4, 6, 7; and in item 5: only retaining 2 sections as “evaluation on social impacts” and “roles of the masses”.

During the development process of the Phase II - Component I (Tertiary Infrastructure Upgrading) as well as when developing similar projects, all activities are wished to carry out correctly following stages as mentioned above. When developing next stages, similar projects should base on specific situation to modify approaches and development methods suitably.
1 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Background of the Project

Vietnam’s cities have rapid growing populations, and infrastructure and utility service investments have lagged far behind demand. Low-income areas have developed, and are continuing to develop, in an ad-hoc unplanned manner with little infrastructure and services. This creates environmental and health hazards for their residents and the city at large. New, innovative and low cost approaches are thus required to address Vietnam’s growing urbanization challenges.

Realizing this, the Government of Vietnam has requested donor assistance to prepare a national program to upgrade low-income communities. Preparatory studies funded through the Cities Alliance have been completed to help develop a National Urban Upgrading Program. The Ministry of Planning and Investment has requested the World Bank to support a Vietnam Urban Upgrading Project (VUUP) as the first major project in the national program. The VUUP aims to upgrade low-income communities in four cities, namely Ho Chi Minh, Hai Phong, Nam Dinh, and Can Tho (Drawing 1). The VUUP will provide basic infrastructure and services improvements (referred to hereafter as tertiary infrastructure) to low-income communities already identified in the cities. To ensure that the tertiary infrastructure provided is able to operate effectively and to its optimum, critical primary and secondary infrastructure (referred to hereafter as trunk infrastructure) is also to be provided as part of the VUUP.

It is anticipated that a number of families will have to be unavoidably resettled, and therefore social housing and/or basic serviced sites for housing will be provided (referred to hereafter as housing developments). The combination of investment for tertiary and trunk infrastructure, and housing developments in each city will be referred to hereafter as the city’s sub-project. In each city, the sub-project is divided into two or three phases, each of which will be implemented over a 2-3 year period. Phase 1 will be prepared before the project is presented to the World Bank’s Board and Phases 2 and 3 will be prepared during project implementation.

1.2 Environmental Management Plan of the Project

According to the Terms of Reference for Phase 1 of Vietnam Urban Upgrading Project – Haiphong Sub-Project the EIA Consultant will prepare Environmental Impact Assessment (EIA) documentation that corresponds to the requirements of the Government of Vietnam and the World Bank safeguard policies OP 4.01 on Environmental Assessment and Annex C Environmental Management Plan and OP 4.11 on Physical Cultural Resources where the concerns of impacts on cultural structures are triggered. The EIA documentation should also give broad picture on environmental condition in the project areas of all the three phases and specify guidance to the preparation of EIA documentations for phases 2 and 3.

The scope of the environmental documentation consists of six main tasks as follows:
1. Review and amend as necessary Community Environmental Management plans (CEMPs) for Community Upgrading Plans (CUPs) for the tertiary infrastructure of Phase 1

2. Site-specific EIAs for trunk infrastructure and housing developments including
   - Description of the components of the Trunk Infrastructure and Housing Development
   - Description of the environment
   - Legislative and regulatory considerations
   - Determination of potential impacts of the proposed components
   - Analysis of alternatives to the proposed Trunk Infrastructure and Housing Development as a whole and its components
   - Develop Environmental Management plans for Trunk Infrastructure and Housing Developments (EMPs)

3. Environmental section of the Environmental and Social Safeguards Framework (ESSF) of the Project Operations Manual

4. Public consultation and public disclosure

5. Reporting

6. Project Environmental Management Plan

Draft EMP has been prepared in September 2003 before the Trunk Infrastructure Consultant has started their work. Therefore especially the information concerning the content, impacts, mitigation measures and cost estimates of the project are only preliminary and will be revised for the final report.

The Draft Environmental Management Plan is based on the following:

- Vietnam Urban Upgrading Project (VUUP) Terms of Reference for the Preparation of Environmental Impact Assessment (EIA) – Phase I, May 2003
- The World Bank OP 4.01 on Environmental Assessment, January 1999
- The World Bank OP 4.11 on Physical Cultural Resources
- Standard Bidding Documents for the Procurement of Works. The World Bank
- Vietnam construction regulation and standard, Volume I, MOC
- Law on Environmental Protection, December 1993
- Decree 175/CP Government Decree on providing Guidance for the Implementation of the Law on Environmental Protection, October 1994
- Vietnam Urban Upgrading Project (VUUP) Haiphong Sub-Project
  - Pre-Feasibility Study Haiphong Low-income Areas, Infrastructure Upgrading Project, Construction Company for Construction Vinaconsult, January 2003 (in English and Vietnamese)
  - Draft Feasibility Study Report Haiphong Low-income Areas Infrastructure Upgrading Project Division No 1 (Components: Primary and Secondary Technical Infrastructure and Tertiary Infrastructure in Phase 1) Appendix 1-8, Construction Company for Construction Vinaconsult, June 30, 2003 (in English), September 2003 in Vietnamese
1.3 Objectives and principles of the Sub-Project

The objectives of Haiphong Sub-Project, as well as the objectives of the Vietnam Urban Upgrading Project in general, are as follows:

- Alleviate poverty in urban areas by improving the living and environmental conditions of the urban poor
- Promote the participatory planning methods for urban upgrading to meet the people's demand
- Use multi-sector approach with communities' consultation in implementation process of upgrading programs.

The most important principle of the project is to active community participation in all stages of preparation, design and implementation processes. The residents, who are living in the project area, will have the right to participate in and benefit from the project as well as contribute to the upgrading works.

1.4 Location of the Project

The location of Component 1 (Tertiary infrastructure), Component 2 (Primary and secondary technical infrastructure) and Component 3 (Housing for the poor) is presented in Drawing 2 and 3. Location of low-income areas (LIAs) in eight wards in five districts is presented in Drawings 4 – 8.

1.5 Scope of the Sub-Project

1.5.1 General

The project will be implemented in two phases. Phase 1 of the project will be carried out in 8 low-income areas (20 residential areas) belonging to 8 wards of five districts of the city as follows:

- Area: 68.9 km²
- Population: 25,720 persons
- Number of households: 6,201

Phase 2 of the project will be carried out in the remaining 34 low-income areas identified in the Pre-Feasibility phase.
The detailed basic data of eight wards belonging to the Phase I is presented in Annex 1 and content of Component 1 in Annex 2.

There are totally six components in the whole project as follows: 1) Tertiary infrastructure; 2) Primary and secondary infrastructure; 3) Housing for poor; 4) Land and housing management; 5) Micro-finance for housing improvement; and 6) TA, Design and Supervision and Training.

Draft Environmental Management Plan has been prepared for components 1, 2 and 3.

1.5.2 Component 1 (Tertiary infrastructure)

New construction and upgrading of tertiary technical infrastructure (roads, drainage, sewerage, water supply, street lighting and solid waste collection) in low-income areas, which are all degraded, lack of investment and are poor quality impacting on living and environmental conditions of communities. Another part of the component is upgrading of social infrastructure such as kindergartens, schools (primary and secondary), health clinics, sites for cultural activities, services etc. (Annex 2). Location of eight LIAs is presented in Drawings 4 – 8.

Table 1-1 Component 1 Investments

<table>
<thead>
<tr>
<th>Sub-component</th>
<th>Investments</th>
<th>Unit</th>
<th>Amount Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roads (2-7 m wide)</td>
<td>(m)</td>
<td>16,000</td>
</tr>
<tr>
<td>2</td>
<td>Street lighting</td>
<td>Pole</td>
<td>400</td>
</tr>
<tr>
<td>3</td>
<td>Water meters and water supply network</td>
<td>Meter</td>
<td>2,700</td>
</tr>
<tr>
<td>4</td>
<td>Drainage and sewerage</td>
<td>(m)</td>
<td>18,000</td>
</tr>
<tr>
<td>5</td>
<td>Solid waste collection site</td>
<td>Site</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>Hand carts</td>
<td>Cart</td>
<td>97</td>
</tr>
<tr>
<td>6</td>
<td>Kindergartens</td>
<td>Unit</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Health clinics</td>
<td>Unit</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Schools (primary and secondary)</td>
<td>Unit</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Sites for cultural activities</td>
<td>Unit</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Feasibility Study, Component 1, 2, 5, 6 September 2003

Tertiary technical and social infrastructure in 8 low-income areas of 8 wards and communes in Phase 1 are according to the Haiphong People's Committee Document No. 3852/CV - WB dated August 19, 2002. Planning method of the components should be as follows to satisfy people's needs and improve effectively living condition:

- Construction projects are in line with CUPs prepared for low-income areas
- Options for each low-income area are described clearly in CUPs

The basic data of 8 selected low-income areas are as follows; the four first areas are in An Kim Hai channel area:

September 2003
Du Hang Kenh ward - An Hai district: 3 low-income areas: Area 1, Area 3 and Trai Le Area (Drawing 4) with area of 0.349 km², population of 7,869 people and number of households 1,918

Trang Minh ward - Kien An district: 3 low-income areas: Area 4, Area 5 and Area 6 (Drawing 5) with area of 0.212 km², population of 3,242 people and number of households 800

Trai Chuoi ward Hong Bang district: Area C (Drawing 6) with area of 0.065 km², population of 2,008 people and number of households 522

Niem Nghia ward - Le Chan district: 3 low-income areas: Area 3, Area 5 and Area 7 (Drawing 7) with area of 0.056 km², population of 2,053 people and number of household 560

Tran Nguyen Han ward - Le Chan district: Area 8 (Drawing 7) with area of 0.011 km²; population of 1,294 people and number of household 310

Cat Dai ward - Le Chan district: Area 8 (Nghia Dia Tay) (Drawing 7) with area of 0.025 km²; population of 1,960 people and number of household 467. This low-income area has problems with many social evils.

Cat Bi ward - Ngo Quyen district: 4 low-income areas: T1, T2, T3 and T4 (Drawing 8) with area of 0.116 km²; population of 7,257 people and number of households 1,556. This level 4 collective quarter was constructed in 1973 with low standard and is already now critically degraded.

May Chai ward - Ngo Quyen district: 3 low-income areas: May Dien, Thuy Tinh and May Chai 1 (Drawing 8) with area of 0.058 km², population of 4,903 people and number of household 1,255

1.5.3 Component 2 (Primary and secondary technical infrastructure)

The main components are as follows:
- Relevant roads such as Chua Hang road from To Hieu road to Highway No. 5 to the direction of South-East and road on top of An Kim Hai Channel
- Upgrade the drainage of An Kim Hai channel in the section from Luon culvert (Thuong Ly canal) to Cau Vuot in Lach Tray street with the length of 5.1 km
- Secondary water supply systems in Kien An and Le Chan district about 8.5 km.

1.5.4 Component 3 (Housing for the poor)

The resettlement site including service area for the urban poor / low-income families will be constructed. The area is about 9.7 ha plus 4.3 ha off-site for technical infrastructure. Total land area required to serve construction of resettlement site is 14 ha at Vinh Niem ward in Le Chan district (Tables 1-1 and 1-2 and Drawing 3). Preparation of Feasibility Study and detailed design of the resettlement site is ongoing and will be submitted for Haiphong People’s Committee for approval.
The site is located in the agricultural area on Hamlet 4 in Vinh Niem commune in An Hai rural district (at present in Le Chan district). In the North are the existing residential areas and planned Ho Sen – Cau Rao 2 road (20.5 m). In the South it is adjacent to the planned construction works of the city and Niem Bridge 2 (50.5 m), which is near the proposed JICA wastewater treatment system. In the East it is adjacent to the existing residential areas and in the West to the planned Ho Sen – Cau Rao 2 road (30m) near the Vinh Niem industrial zone.

On the proposed site, there are about 20 households, which have to be resettled. 1.4 km long and 35 m wide access road will be constructed to the resettlement site.

Preparation of resettlement site should be carried out in priority in Phase I of the project because it is the basic for other components to be implemented according to the time schedule.

The more detailed information will be presented in Final Environmental Impact Assessment Report when Resettlement Site Feasibility Study and Draft Resettlement Action Plan are available.

Table 1-1 Land use of Vinh Niem Resettlement Site, September 2003 situation

<table>
<thead>
<tr>
<th>No.</th>
<th>Land use</th>
<th>Area (m²)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture land</td>
<td>106672</td>
<td>70.45</td>
</tr>
<tr>
<td>2</td>
<td>Housing land</td>
<td>39614</td>
<td>26.16</td>
</tr>
<tr>
<td>3</td>
<td>Water area of Tay Nam canal</td>
<td>1040</td>
<td>0.69</td>
</tr>
<tr>
<td>4</td>
<td>Cemetery area</td>
<td>2346</td>
<td>1.55</td>
</tr>
<tr>
<td>5</td>
<td>Transportation area</td>
<td>1739</td>
<td>1.15</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>151,421</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Table 1-2 Infrastructure of Vinh Niem Resettlement Site, September 2003 situation

<table>
<thead>
<tr>
<th>Land use</th>
<th>Area (m²)</th>
<th>(%)</th>
<th>Average Floor</th>
<th>Construct density</th>
<th>Land use factor</th>
<th>Plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public land</td>
<td>9306</td>
<td>7.28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market</td>
<td>4653</td>
<td>1.5</td>
<td>30</td>
<td>0.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>4653</td>
<td>3</td>
<td>40</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation land, car park</td>
<td>59113</td>
<td>46.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tree, gymnastics area</td>
<td>10155</td>
<td>7.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>49228</td>
<td>38.55</td>
<td>2</td>
<td>90</td>
<td>1.8</td>
<td>1092</td>
</tr>
</tbody>
</table>

1.6 Present Environmental Setting

Many of the environmental problems in Haiphong are widely spread over most of the city area, some are more localised and act mostly as point-source polluters. The coastal delta area has been populated for hundreds of years, because it is favourable for cultivation and the sea is located nearby. Population density is high, with almost no uncultivated or unbuilt area. The area of lakes is decreasing because of encroachment for housing purposes.

Air emissions in Haiphong mainly originate from industry, traffic, burning of coal bricks that are used in households for cooking and burning of waste. Monitoring of air emissions in Haiphong is not systematic, and no action has been taken to reduce air pollution. However, in Haiphong there are still plenty of green areas, which improve the local air quality.
All surface waters around the city centre, except some lakes and ponds and constructed irrigation channels, are saline as the rivers are affected by tidal fluctuation.

The problems of sanitation and drainage cause the most significant environmental and public health risks in Haiphong. There are no operating wastewater treatment facilities (except a small package treatment plant in Bong Sen village). Two treatment plants have been constructed for hospital effluent, at Children’s Hospital and Viet Tiep hospital. These treatment plants have been out of operation for several years. Domestic and industrial wastewater is mainly discharged directly to the channels, lakes, or rivers, where the aquatic ecosystem provides the only wastewater treatment. The system of lakes and channels also stores storm water during high tide. The sea is the ultimate recipient of the city effluents.

The lakes and channels are already overloaded with sewage and their natural cleaning capacity has therefore drastically decreased. They have turned to smelling, heavily polluted and inaesthetlic water bodies creating amounts of mosquitoes, which cause a public health risk.

Although the collection of recyclable material at the source of generation is quite efficient in Haiphong, the waste collection, recycling, treatment and disposal need further improvements. The main streets in Haiphong are mainly clean of waste, but the back streets and open areas are in many places covered by garbage. Dumping of waste in the ground in urban areas, where it remains for considerable time before being collected, if at all, clogs the drains and causes risks to the environment (contamination of soil, surface and groundwater) and to public health. No proper treatment or storage of industrial and hazardous waste exists so far. One serious problem is the common habit to throw garbage straight to channels and lakes.

The public awareness on environmental problems has risen in Vietnam during the past few years. However, the complexity of the problems and lack of money have retarded this positive development.
2 ENVIRONMENTAL LEGISLATION

2.1 Environmental Management

Until now the Ministry of Science, Technology and Environment (MOSTE) has been the top decision-making body with overall responsibility within the environmental sector. Besides the Ministry, there have been several other agencies involved in the management and protection of the environment. MOSTE’s main role has been to assist the Government in the strategies and policy-planning issues related to science, technology and environment.

Within the Ministry, the National Environmental Agency (NEA) has been the environmental arm, whose main task is to act as co-ordinating body for other Ministries with environmental responsibilities. It is also charged with developing legislation, regulations and guidelines, programs, control and monitoring systems to enforce the production of the environment throughout the country.

National Assembly has approved the government’s proposal to create the Ministry for Natural Resources and Environment (MONRE) by decision 02/2002/QH11 on August 5, 2002. Decree No 86/2002/ND-CP on November 5, 2002 provides in general functions, tasks, powers and organisation structure of the ministry and ministerial agencies. Decree No 91/2002/ND-CP on the functions, tasks, powers and organisational structure of the Ministry of Natural Resources and Environment has been given on November 11, 2002. The new ministry will co-operate with the General Department of Land Administration, the General Hydro-Meteorology Department and environmental offices that now operate under the Ministry of Science, Technology and Environment.

MONRE is a government body to exercise the state function of management over the land, water resources, minerals, environment, meteorology, hydrogeography, measuring and mapping in the national scope; exercise the governance over the public services and represent the owner of state capital in enterprises using state budgets relating to natural resources of land, water, minerals, environment, meteorology, hydrogeography, measuring and mapping specified by laws.

Concerning environment the tasks and authorities are as follows:

- Direct and supervise the implementation of the regulations and measures for the protection of the environment, the programs and projects on the prevention of combat and overcoming the degradation and pollution, environmental breakdown as assigned by the government
- Uniformly manage the national environmental monitoring system; summarise and treat data resulted from environmental monitoring and regularly assess the environment; forecast the environmental changes
- Appraise environmental impact assessment reports of the projects and business, and production units; regulate environmental standards and uniformly manage the licensing, restoring the environmental standards satisfied certificates according to the regulations of the laws
- Mobilise the donor resources, receive the investment capital from the State to support programmes, projects, activities and tasks to protect the environment and manage the utilization of Vietnam Environmental Protection Fund.

2.2 Environmental Law and Decree

In Vietnam, the basic national environmental policy is based on the Law on Organisation of the Government (September 30, 1992), the Law on Environmental Protection (December, 27, 1993) and the Decree No. 175-CP (October 18, 1994).

The National Assembly ratified the Law on Environmental Protection on December 27, 1993, and the decree has been issued on October 18, 1994. In the Law, there are very clear articles to prevent environmental pollution in general, and also articles concerning wastewater management. The Government Decree provides the guidance for implementation of the law on environmental protection.

The general provisions of the law are described in Chapter 1, which defines the meaning of the terms (Law on Environmental Protection, 1993).

Article 2 defines waste, pollutants and environmental pollution as follows:
“Wastes mean substances discharged from daily life, production processes or other activities. Wastes may be in a solid, gaseous, liquid or other forms. Pollutants mean factors that render the environment noxious. Environmental pollution means alteration in the properties of the environment, violating environmental standards”.

2.3 Laws and Regulations on Environmental Impact Assessment

The Articles 17 and 18 describe the EIA-procedure. According to the Law on Environmental Protection, Article 18:

Organisations, individuals when constructing, renovating production areas, population centres or economic, scientific, technical, health, cultural, social, security and defence facilities, owners of foreign investment or joint venture projects, and owners of other socio-economic development projects, must submit EIA reports to the State Management Agency for environmental protection for appraisal. The result of the appraisal of EIA reports shall constitute one of the bases for competent authorities to approve the projects or authorise their implementation. The Government shall stipulate in detail the formats for the preparation and appraisal of EIA reports and shall issue specific regulations with regard to special security and defence establishments mentioned in Article 17 and in this article. The National Assembly shall consider and make decision on projects with major environmental impacts. The Standing Committee of the National Assembly shall determine a schedule of such types of projects.

In October 18, 1994, the Government of Vietnam issued a decree providing Guidance for the Implementation of the Law on Environmental Protection, which includes assessment of environmental impacts. This decree, together with other documents needed for an EIA, was published in 1995 by MOSTE as a separate guideline document.

Until now MOSTE has been the responsible authority of the approval of Environmental Impact Assessments, but according to the Decree 91/2002/ND-CP
under MONRE has been established among many other departments Environmental Impact Assessment and Appraisal Department. The EIA can, however, be appraised by the local DONRE based on their knowledge of local conditions and further be delivered to PC for approval, if delegated by MONRE.

2.4 Environmental Standards and Regulations

The Government shall stipulate the nomenclature of environmental standards and delegate the authority at different levels for promulgating and supervising the implementation of such standards.

MOSTE has published 1995, 1998, 1999, 2000 and 2001 Vietnamese Environmental Standards, and standardisation work is in progress. From now on MONRE will continue the work. In cases, where the applicable Vietnamese standard is inadequate, not regulated or applicable, project agencies must obtain MONREs approval for the use of equivalent standards of the countries that have provided the technology and equipment to Vietnam, or apply equivalent standard from a third country. At least the following environmental standards are related to water and wastewater quality (Table 2-1). Besides water related standards there are several standards concerning air quality, noise and soil quality.

Table 2-1 Vietnamese environmental standards (MoSTE 1995, 1998, 1999, 2000, 2001)

<table>
<thead>
<tr>
<th>Number of standard</th>
<th>Name of standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCVN 5524-1995</td>
<td>General requirements for protecting surface water against pollution</td>
</tr>
<tr>
<td>TCVN 5525-1995</td>
<td>General requirements for protection of underground water</td>
</tr>
<tr>
<td>TCVN 5942-1995</td>
<td>Surface water quality standards for raw water supply and general use</td>
</tr>
<tr>
<td>TCVN 5944-1995</td>
<td>Groundwater quality standard</td>
</tr>
<tr>
<td>TCVN 6772:2000</td>
<td>Water quality – Domestic wastewater standards</td>
</tr>
<tr>
<td>TCVN 6774:2000</td>
<td>Water quality – Fresh-water quality guidelines for protection of aquatic sites</td>
</tr>
<tr>
<td>TCVN 6982:2001</td>
<td>Water quality – Standards for industrial effluent discharged into rivers using for water sports and recreation</td>
</tr>
<tr>
<td>TCVN 6983:2001</td>
<td>Water quality – Standards for industrial effluent discharged into lakes using for water sports and recreation</td>
</tr>
<tr>
<td>TCVN 6984:2001</td>
<td>Water quality – Standards for industrial effluents discharged into rivers using for protection of aquatic life</td>
</tr>
<tr>
<td>TCVN 6985:2001</td>
<td>Water quality – Standards for industrial effluent discharged into lakes using for protection of aquatic life</td>
</tr>
<tr>
<td>TCVN 5937-1995, 5940-1995</td>
<td>Monitoring system for the air quality</td>
</tr>
<tr>
<td>TCVN 5948-1999</td>
<td>Allowed limitation values for road motor vehicle noise</td>
</tr>
<tr>
<td>TCVN 5949-1998</td>
<td>Allowed limitation values for noise in public and residential areas</td>
</tr>
<tr>
<td>TCVN 6962:2001</td>
<td>Vibration and shock – Vibration emitted by construction works and factories – Maximum permitted levels in the environment of public and residential areas</td>
</tr>
</tbody>
</table>
2.5 **Hygienic Regulations**

The Council of Ministers promulgated the Hygienic Regulations and Administrative Penalty in Health Service in July 1991 (No: 23/HDBT). These are based on the Organisation Law and the People Health Protection Law. There are directive principles for raising awareness among the public; preventive measures, environmental improvement and cleansing; assurance of occupational health and food hygiene.

2.6 **World Bank Guidelines**

The environmental impact assessment study for the sanitation project was designed to evaluate its status with respect to all applicable World Bank environmental and operational policies and guidelines.

During the EA process for this project, a review of World Bank environmental and operational policies was carried out with respect to their relevance to this project. The policies directly relevant to this project are Environmental Assessment (OP 4.01), Cultural Property (OP 4.11) and Involuntary Resettlement (OP 4.30). The specific World Bank guidelines that were identified as being applicable to this project are Environmental Assessment Sourcebook, Volume I and II (1991) and Pollution Prevention and Abatement Handbook 1997.

For all Category A projects proposed for IBRD or IDA financing, during the EA process, the borrower consults project-affected groups and local nongovernmental organisations (NGOs) about the project's environmental aspects and takes their views into account. For Category A projects, the borrower consults these groups at least twice: shortly after environmental screening and before the terms of reference for the EA is finalised; and once the draft EA report is prepared.

For meaningful consultations between the borrower and project-affected groups and local NGOs on all Category A projects for IBRD or IDA financing, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.

For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes draft EA report available at a public place accessible to project-affected groups and local NGOs.

Once the borrower officially transmits the Category A EA Report to the Bank, the Bank distributes the summary (in English) to the executive directors (EDs) and makes the report available through its InfoShop. If the borrower objects to the Bank's releasing an EA report through its InfoShop, Bank staff (a) do not continue processing an IDA project or (b) for IBRD project, submit the issue of further processing to the EDs.
According to the World Bank Operational Policy 4.01 – Annex C Environmental Management Plan:

1. A project's environmental management plan (EMP) consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also includes the actions needed to implement these measures. Management plans are essential elements of EA reports for Category A projects; for many Category B projects, the EA may result in a management plan only. To prepare a management plan, the borrower and its EA design team (a) identify the set of responses to potentially adverse impacts; (b) determine requirements for ensuring that those responses are made effectively and in a timely manner; and (c) describe the means for meeting those requirements. More specifically, the EMP includes the following components

Mitigation

2. The EMP identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the EMP

(a) identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous people or involuntary resettlement);

(b) describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;

(c) estimates any potential environmental impacts of these measures; and

(d) provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

Monitoring

3. Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation measures described in the EMP. Specifically, the monitoring section of the EMP provides

(a) specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and
(b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

Capacity Development and Training

4. To support timely and effective implementation of environmental project components and mitigation measures, the EMP draws on the EA's assessment of the existence, role, and capability of environmental units on site or at the agency and ministry level. If necessary, the EMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of EA recommendations. Specifically, the EMP provides a specific description of institutional arrangements—who is responsible for carrying out the mitigatory and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

Implementation Schedule and Cost Estimates

5. For all three aspects (mitigation, monitoring, and capacity development), the EMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the total project cost tables.

Integration of EMP with Project

6. The borrower's decision to proceed with a project, and the Bank's decision to support it, are predicated in part on the expectation that the EMP will be executed effectively. Consequently, the Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and its assignment of institutional responsibilities, and it must be integrated into the project's overall planning, design, budget, and implementation. Such integration is achieved by establishing the EMP within the project so that the plan will receive funding and supervision along with the other components.
3 ENVIRONMENTAL IMPACTS

3.1 General

Upgrading of tertiary infrastructure will reduce poverty in the low-income areas in Haiphong by improving infrastructure and basic services and thus providing better environment for the poor people.

Primary and secondary infrastructure will focus on rehabilitation of An Kim Hai Channel, which has many impacts on environmental pollution and landscape of the city. The upgrading works will improve significantly the environment of the area and the city as a whole. The environmental mitigation measures and management will be strictly required during construction and operation phase to reduce adverse impacts on environment and deteriorating landscape. These actions will also improve investment effectiveness on regional and city level.

Existing environmental conditions fail to achieve the environmental quality standards required by the Government policy and legislation. In order to achieve the long-term benefits, the project is expected to generate short-term adverse impacts, particularly during the construction phase due to the proposed scale of the investment. However, the majority of adverse construction phase impacts can be mitigated through:

- The incorporation of appropriate contract conditions that define operating procedures to be adopted by contractors
- Maintaining an effective consultation process that ensures effective participation of community (primary stakeholder) level in implementing the Community Environmental Management Plan (CEMP) and Environmental Management Plan (EMP)
- Ensuring the project management framework provides coherent decision making about defined actions in the event of non-compliance

Almost 26,000 residents in eight LIAs in Phase I can get direct socio-economic and environmental benefits through provision of public utilities, services and infrastructure. The number of indirect beneficiaries in the surrounding areas is estimated to be 7,500.

Environmental impact matrixes for each component are presented in Annex 3 n Tables 3.1–3.10.

3.2 Component 1: Tertiary Infrastructure

3.2.1 Design Phase

Design criteria adopted for upgrading tertiary infrastructure in LIAs will be achieved through extended consultation with residents and community groups to achieve all the interventions proposed aim to clear social, economic and environmental benefits.
3.2.2 Construction Phase

During the upgrading and construction of roads, lanes, drainage and sewerage, street lighting, upgrading solid waste collection and construction of kindergartens and schools there will be various adverse impacts on the environment at different levels. Construction will cause short-term air and noise pollution. Sorting of solid waste is a new concept and might be difficult to adopt in the beginning.

The means of transport, construction equipments and manpower will be in the continuous work during the whole construction process. These will cause inconvenience to people and risk of pollution to environment.

The gathering of large number of manpower for construction could cause some impacts on the life and surrounding environment at the construction sites. In already densely populated areas this would increase traffic problems, chaotic security and generation of new type of wastes especially at the sites where the workers are concentrated.

The construction of drainage and sewerage system could also cause some adverse impacts to the environment, if not properly mitigated:
- Low sanitation and bad-looking condition of construction site
- Temporary flooding due to the flowing of sediments into the other drainage and/or blocking the flows of the existing drainage
- Scattering of the construction material and excavated soil around the construction and along the transportation routes cause inconvenience, unpleasant odour and air pollution

3.2.3 Operation Phase

The implementation of CUP prepared for the LIAs will give clear socio-economic and environmental benefits to residents through the provision of improved public utilities and services and approaching improved conveniences.

3.3 Component 2: Primary and Secondary Infrastructure

3.3.1 Design Phase

Upgrading of An Kim Hai Channel, improving roads and street will have impact on around 835 households, of which about 417 households have to be relocated and more than 400 households are partially affected. These socio-economic impacts on the living conditions of the people have to be considered in the design selecting options to minimise the need of resettlement.

3.3.2 Construction Phase

Construction will have temporary impacts on air quality. Ground levelling and transportation need a considerable amount of equipment and means of transport. The dust and smoke arising from equipment, means of transport and scattered construction materials will impact on health of workers and residents living in
surroundings. All kind of equipment will create exhaust fumes including CO, CO\textsubscript{2}, NO\textsubscript{x}, SO\textsubscript{x} and dust on construction sites and along transportation routes.

The equipment will cause noise, which has impact on nervous system of workers and residents living in the area. The noise level depends on the types, density and technical condition of the means of transport, but normally, the noise for heavy vehicles is about 100 dBA.

There might be several impacts on water environment. Water discharged or leaching to channels from construction sites might be contaminated and having soil, sediment and garbage, but also oil spilled from construction equipment and means of transport.

There might be temporarily problems in the surrounding areas, if wastewater from households living along both sides of the An Kim Hai Channel and roads will not be collected properly during the construction of drainage system. During the construction of box culverts the flow of An Kim Hai Channel will be blocked, which might cause flooding and other problems without mitigation measures.

For the time being An Kim Hai Channel is almost full of solid waste and sediment, which have to be removed before construction of box culverts and the road on the top of section 2. Collection and transportation of the excavated material will cause temporary nuisance around the construction site and along transportation routes.

The scenery and environment of the area around An Kim Hai Channel and Du Hang and Lam Tuong Lakes will be changed remarkable due to the construction. During the construction there will be temporary adverse impacts, but in the long-term now untidy and charmless scenery will be improved. Also the safety of the area will be improved due to the street lighting and for the time being too common social evils will decrease.

3.3.3 Operation Phase

During operation the impacts are mainly positive and due to the improved infrastructure, especially improved traffic conditions and improved quality of An Kim Hai Channel.

3.4 Component 3: Resettlement Site

3.4.1 Design Phase

Selection the location of needed resettlement site is always complicated, because in the densely populated areas there are is no vacant and uninhabited area available. Therefore location of resettlement site is always a compromise and usually causes an additional need of resettlement of the people who live in the proposed area. Land use and existing activities in the surrounding areas have to be considered, too.

The proposed resettlement in Vinh Niem commune in An Hai District is for the time being mostly agricultural area and the land use and scenery will be changed totally. The design and location of facilities should be adjusted to the existing scenery. On
the other hand the area is located near already existing Vinh Niem industrial zone, which has already changed the land use in the area, and next to the site will be constructed Ho Sen – Cau Rao 2 road. There is also proposal to construct wastewater treatment plant next to the proposed resettlement site, but no approval or construction decision have not been made, yet.

3.4.2 Construction Phase

Construction of infrastructure and houses at large, 9.7 ha, resettlement site will cause temporary, but reasonable long-lasting inconvenience to the surroundings. Especially the amount of traffic will increase remarkably during the whole construction period and the existing road to the proposed site is not wide enough for transportation during construction and operation. Construction will also cause temporary noise problems in the tranquil agriculture area.

Large construction works needs a big number of workers, which might cause temporary inconvenience and decrease of security in the area. On the other hand to provide different kind of services to the workers increase the possibility for small business i.e. food-stalls, cafes etc.

3.4.3 Operation Phase

During the operation the resettlement site causes the same type of impacts than any other living area. However, impact of wastewater is smaller than normally because there is wastewater treatment plant in the area.

High density of population, construction and living activities of residents in resettlement site will affect originally tranquil agricultural area. It might be also difficult for people to settle down in new area especially if needed services are not constructed timely. New social network is difficult to establish and this might cause problems and uncomfortable feelings in the beginning.
4 MITIGATION MEASURES

4.1 Mitigation Measures during Design Phase

4.1.1 General Design Instructions

Environmental matters have to be integrated in all the design work and planning of the project. The designing has to be done by minimising the adverse impacts on environment using as much as possible existing facilities and selecting the location of new facilities in areas where the disturbance to environment, people and existing structures is the smallest. Where possible existing rights-of-way has to be used rather than create new ones. The key mitigation measures are noticed in the Feasibility Study Main Report, Project Implementation Plan Bidding Documents and Contract Documents.

According to the Vietnamese Construction Regulation Standard Article 3.3 Protection of Natural Resources and Environment construction projects should:

- Not cause adverse effect to environment, and technical regulations on scenery and environment protection should be observed
- Protect the natural preservation areas, and historical, cultural and architectural places
- Extracting natural resource must ensure the rationality and cause no obstacle to the next exploitation
- Respect traditional customs, practices, religions of people living in and around the construction area.

In Construction Regulation Standard there are instructions especially for master plan including general instructions for designing sewerage and drainage system. Urban drainage system should be assured:

- To discharge all types of urban waste water
- To have suitable solution for treating wastewater so that the urban area is not flooded, and environment and water sources are not polluted.

In Standard Branch Sewerage and Drainage System and Works, Standard Designs there are more detailed design instructions. However, international design standards have to be introduced and used in design work.

The construction works should be implemented stepwise in order to minimize the moving/transfering of equipment as well as to avoid chaos for the surrounding communities.

In spite of the general mitigation measured concerning the whole project local special mitigation measures described in each CEMP of 8 LIAs have to be considered and followed.
4.1.2 Component 1: Tertiary Infrastructure

Design of Roads

The design has to be done according to with the communities agreed standards described in Community Upgrading Plans (CUPs) and Feasibility Study Report. The location and the width of roads and alleys have to be adjusted to the local circumstances to avoid unnecessary resettlement.

Design of Street Lighting

The Vietnamese design standards and safety regulations have to be followed in the design. In the design of electricity facilities special attention has to be paid to the safety regulations to prevent possibility of accidents.

Design of Water Supply Facilities

The design of water supply for proposed two wards has to be done in co-operation with Haiphong Water Supply Company following the standards and norms used in the design of water supply of the other wards of the city.

Design of Drainage and Sewerage

To prevent the possibility of contamination water supply system a special attention has to be paid to the crossing of water pipes and possible sewers. It is not allowed to have water pipes going through the drainage manholes or box culverts. If possible the drainage system should be designed as far as possible from water pipelines.

Discharging points of the drainage system have to be selected so that the adverse impact is minimised and the back flow of drainage water to pipes has to be prevented.

Drainage design principles have to be selected in co-operation with the other projects implemented in the same area, especially with Vietnam: Three Cities Sanitation Project – Haiphong Sub-Project (1B Project), to avoid overlapping and to optimise the effectiveness of drainage system.

Design of Solid Waste Collection

Wards, communes and residential areas should set up self-management groups to collect solid waste under the support of URENCO. The location of solid waste collection points has to be selected together with communities to avoid complains from the people. Community participation campaigns implemented in URENCO should be continued and expanded during design phase. Already available brochures prepared for URENCO should be delivered and people should be trained how to sort solid waste also to these areas.

Design of Social Infrastructure

Location and size of the different construction should be done according to the needs of communities described in CUPS and Feasibility Study. The Vietnamese construction standards, regulations and dimensioning instructions have to be followed.

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4.1.3 Component 2: Primary and Secondary Infrastructure

Design of Upgrading An Kim Hai Channel

Drainage design principles have to be selected in co-operation with the other projects implemented in the same area, especially with Vietnam: Three Cities Sanitation Project – Haiphong Sub-Project (1B Project), to avoid overlapping and to optimise the effectiveness of drainage system.

The design has to be done by minimising the need of resettlement. Transportation and disposal of excavated material has to be designing and necessary area reserve from Trang Cat landfill for disposal.

Proper access to the construction sites has to be designed, too.

Design of Roads

Road alignments have to be designed avoiding possible cultural and historical monuments i.e. pagodas, temples and communal houses, also the need of resettlement has to be minimised.

Design of Street Lighting

The Vietnamese design standards and safety regulations have to be followed in the design. In the design of electricity facilities special attention has to be paid to the safety regulations to prevent possibility of accidents.

4.1.4 Component 3: Design of Resettlement Site

The resettlement site need to be planned as a complete residential area with sufficiently functions according to Vietnam planning standards and the Haiphong City Master Plan. The technical standards applied for resettlement site design should be considered carefully to conform affordability of the modern households. Housing for the poor should be designed suitably with the affordability of the poor households.

In the design of resettlement site has to be followed good design standard for new urban areas. Different facilities have to be located in the logical way, i.e. kindergarten and school near parks and recreational areas. There has to be easy access to market also with motorbikes and cars, and enough parking place has to be reserved and from the very beginning. Houses should be faced in the optimal way to protect from direct sunshine.

In the design of the location of facilities of Vinh Niem resettlement site has to be considered the construction of Ho Sen – Cau Rao 2 road and in the future possible construction of wastewater treatment plant in the vicinity of the resettlement site. There should be buffer zone between resettlement site and wastewater treatment plant site. In the design has to be paid special attention to the existing and planned natural and man-made structures and facilities and utilize them as much as possible. The entire necessary infrastructure has to be designed according to the relevant regulations and standards.
The proposed area is low-lying, 50 cm lower than the city foundations, and this has to be considered in the sewerage and drainage design. Proper access road to the resettlement site has to be designed, too.

4.1.5 Public Hearings and Awareness

Although there has been community participation from the very beginning of project preparation and Community Upgrading Plans have been prepared and Community Environmental Management Plans will be prepared, it is necessary to inform people about the progress of the works during the design phase.

Draft Environmental Impact Assessment report has to be available in agreed public place in Vietnamese and leaflets have to be delivered to the people.

4.1.6 Linkage with Resettlement Action Plan

Living conditions and rights of the people already living on resettlement site should be considered in design. Design has to be done so that selected options require as little as possible resettlement. Site clearance has to be done in proper way. All the material has to be transported in agreed and appropriate place. As much as possible of material should be recycled.

4.2 Mitigation Measures during Construction Works

4.2.1 General

All works including to the Project have to be implemented following the appropriate standards, specifications and working methods given in the Contract Document.

4.2.2 Noise, Odour, Litter and Dust

Maximum permitted noise level in public and residential areas is given in Vietnamese standard TCVN 5949-1998. The strongest limitations are from 10 p.m. to 6 a.m. in the vicinity of hospitals, sanatoriums, libraries and kindergartens where maximum noise level is 40 dB.

During excavation and dredging works of lakes there will be a local odour nuisance to the public as long as the works will take place. To minimise the odour nuisance the especially the dredging works have to be carried out during dry season.

Release of heavy metals and possible organic micro-pollutants and loose sediments to downstream during dredging works of An Kim Hai channel has to be minimised by using dry excavation and preventing straight discharge of water into the river.

It is extremely important to inform the local people in advance about the public nuisance during the dredging and other construction works.

Appropriate equipment should be used to prevent overloading of trucks and to collect accidental spills (sludge, oils from equipment, etc.) during rehabilitation, construction and dredging works.
The Constructor is responsible to collect all the solid waste from work sites and transport it to the landfill.

In the construction sites dust, litter and public inconvenience has to be minimised by good construction management and site supervision. To minimise dust emissions caused by construction works, sprinkling the streets with water is recommended in the vicinity of construction sites.

If there is a need for incineration of solid wastes at the construction sites, an appropriate control measure is required, and in some cases, the local authorities must approve these activities before starting implementation. Waste and disposal of excavated materials has to be disposed at the sites, which are agreed with URENCO.

4.2.3 Health and Safety

In all construction works local health and safety working methods and instruction given in Contract Documents have to be followed up.

Safety, Security and Protection of the Environment

The Contractor shall, throughout the execution and completion of the works and remedying of any defects therein:

- Have full regard for the safety of all persons entitled to be upon the site and keep the site and the works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons.
- Provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when and where necessary or required by the Engineer or by any duly constituted authority, for the protection of the Works or for the safety and convenience of the public or others, and
- Take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

Accidents and Insurance

The Employer has no responsibility for injuries that may be suffered by employees of the Contractor, unless such injury results from an act or default of the Employer. In such circumstances the injured person would be regarded as a “third party” to the Employer and the Employer would have the benefit of the Third Party insurance.

The Contractor is required to insure his liability for death or injury to his own employees and he should also ascertain that all Subcontractors have similar insurance in force in regard to their employees.

During the execution of the works the Contractor shall keep the site reasonably free from all unnecessary obstructions and shall store or dispose of any Contractor’s equipment and surplus materials and clear away and remove from the site any wreckage, rubbish or temporary works no longer required.

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The Contractor shall have on his staff at the Site an officer dealing only with questions regarding the safety and protection against accidents of all staff and labour. This officer shall be qualified for his work and shall have the authority to issue instructions and shall take protective measures to prevent accidents.

Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour and, in collaboration with and to the requirements of the local health authorities, to ensure that medical staff, first aid equipment and stores, sick bay and suitable ambulance service are available at the camps, housing and on the Site at all times throughout the period of the Contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygienic requirements.

The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.

The Contractor is responsible to provide appropriate equipment, tools and protective clothing to the workers.

The Contractor has to ensure that appropriate working methods are applied.

Anti-vibration mountings and noise insulation on equipment has to be used when possible. The Contractor has to provide and train how to use ear protectors for workers when noise level in the working place exceeds 85 dB.

The removed material from construction sites has to be handled, transported and disposed according to the safety instructions.

Safety and Health during Dredging of Channel and Sludge Treatment

The Contractor has to follow strictly safety and health regulations during dredging of lakes, and during transportation and treatment of dredged sludge.

The dredging has to be organised so that the need to go to water is minimised.

Special attention has to be paid to avoid the straight contact with sludge. The Contractor has to provide protective clothing including waterproof overall, safety wellingtons and gloves. Workers have to use protective measures to avoid skin or eye contact and inhalation has to be use during dusty work periods, e.g. during drying of the sludge, loading and unloading of the dried sludge and any direct contact with the sludge. Proper PVC gloves have to be used. It is recommended that pregnant women are not working with the sediments because the possible high chromium concentrations.

A possibility to proper washing with clean water has to be arranged during and after the working. Clean water and first aid kit has to be available to wash and treat the possible cuts and wounds.
4.2.4 Traffic and Transportation Arrangements

All operations necessary for the execution and completion of the works and the remedying of any defects therein shall be carried on so as not to interfere unnecessarily or improperly with:

- The convenience of the public
- The access to, use and occupation of public or private roads and footpaths to or of properties whether in the possession of the Employer or of any other person.

The contractor shall use every reasonable means to prevent any of the roads or bridges communicating with or on the routes to the site from being damaged or injured by any traffic of the Contractor or any of his Subcontractors. In particular, the Contractor shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of materials, plant, Contractor’s equipment or temporary works from and to the site shall be limited, as far as reasonably possible.

Transportation of Sludge from Channel

The nuisance caused by transportation of materials and especially dredged sludge has to be minimised by arranging transportation and construction on busy main streets only outside rush hours and in narrow streets in residential areas only during the day. The transportation has to be avoided between 10 p.m. to 6 a.m. and is allowed only on the request of traffic police. The noise level limitations given in the Vietnamese standard TCVN 5949-1998 have to be followed.

Careful planning of dredging, excavation, construction and transportation schedules, and planning and selection of routes, as well as choice of transportation vehicles will minimise dust.

Loads have to be covered tightly to minimise spread of dust and preventing dropping of material from the loads to the roads. Sludge from sewers with high water content has to be transported in special sludge tank to avoid any spills to the roads.

4.2.5 Working Time and Site Arrangements

Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Engineer, proposed Site regulations for the Employer’s approval, which approval shall not be unreasonable withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the facilities, gate control, sanitation, medical care, and fire prevention.

Sign to show the name of the Project, the name of Employer and the name of Contractor has to locate in visible place in the construction site.
Site Clearance

Site Clearance in course of Performance: In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

Clearance of the Site after Completion: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site, and shall leave the Site and Facilities clean and safe.

Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

Work at Night and on Holidays

Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the country where the Site is located without prior written consent of the Employer, except where work is necessary or required to ensure safety of the Facilities or for the protection of life, or to prevent loss or damage to property, when the Contractor shall immediately advise the Engineer.

4.2.6 Public Relations

The District PMU shall announce the construction works and new traffic arrangements during construction works to the public regionally in newspapers, TV and radio. Locally the announcement is given to the ward representatives who will inform the residents. Loudspeakers can be used during the construction work to give the latest information in concerning areas. It is extremely important to inform the local people in advance about the public nuisance and especially possible odour nuisance during dredging of lakes.

4.3 Mitigation Measures during Operation

4.3.1 Component 1: Tertiary Infrastructure

The instructions agreed in CUPs and CEMP s have to be followed, i.e.

- Regular inspection of the condition of drainage system, water supply system and electricity system, possible breakages have to be repaired immediately
- Prevent solid waste disposal into the alleys and drainage by improved solid waste management
- Meet operational and safety standards
4.3.2 Component 2: Primary and Secondary Infrastructure

The instructions agreed in CUPs and CEMPs have to be followed, i.e.
- Condition of box culverts has to be checked regularly to avoid blockages; solid waste has to be collected from channel and culvert; and campaigns to stop littering should be arranged
- Condition of roads, street lighting and drainage along the roads have to be followed, possible breakages have to be repaired immediately

4.3.3 Component 3: Resettlement Site

The good operation and maintenance governance has to be followed concerning the use of all infrastructure facilities. Possible breakages and problems have to be prepared and solved as soon as possible. Special attention has to be paid to the operation and maintenance of infrastructure facilities.

4.4 Summary of Mitigation Measures

<table>
<thead>
<tr>
<th>Phase</th>
<th>Main mitigation measures</th>
<th>Responsible organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>- International and Vietnamese design criteria and standards to be used &lt;br&gt; - Drainage and widening of alleys designed so that need for resettlement is minimised &lt;br&gt; - Works designed to implemented during dry season</td>
<td>Design Consultant Design Consultant</td>
</tr>
<tr>
<td>Construction</td>
<td>- Minimise dust, odour, litter, noise and traffic emissions by good operation management and site supervision &lt;br&gt; - Appropriate working methods have to be followed &lt;br&gt; - Sites have to be kept clean and safe during and after the work &lt;br&gt; - Safety and health regulations has to be strictly followed &lt;br&gt; - Transportation has to be minimised and routes selected to avoid public nuisance &lt;br&gt; - Transportation during rush hours and night has to be avoided &lt;br&gt; - Tight and proper equipment to transport sediment and garbage has to be used to avoid accidental spills and odour nuisances &lt;br&gt; - Construction sites and time has to be informed to the local people in advance</td>
<td>Contractor Contractor Contractor Contractor Contractor PMU</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>- Follow Project Operations Manual, CUPs, CEMPs and EMP &lt;br&gt; - Minimise dust, odour, litter, noise and traffic emissions by good operation and maintenance supervision &lt;br&gt; - Appropriate working methods have to be followed &lt;br&gt; - Immediate preparation of breakages</td>
<td>PMU PMU PMU Communities</td>
</tr>
</tbody>
</table>
5 MONITORING PROGRAMMES

5.1 Present Drainage and Sanitation Monitoring

Into SADCo has been established Environmental Monitoring System in November 2001 to monitor impacts of Vietnam: 3 Cities Sanitation Project – Haiphong Sub-Project. The Environmental Monitoring System includes the following components:

- Water and sediment quality data
- Flooding data
- Groundwater level monitoring
- Health indicators
- Household sanitation improvements

The responsibilities have been agreed with PMU and SADCo. SADCo is in charge of sampling and analysing and collected data is stored in the PMU’s computer and environmental archive.

**Water and sediment quality**

Water and sediment samples are taken from North-East channel system from five points and from South-West channel system from five points. The parameters to be analysed are the same as proposed in Environmental Management Plan in December 1998. Some changes have been made to the original parameter list based on the recommendations of the WB environmental specialist.

**Table 5-1 Proposed Analytical Parameters of Water and Sediment Monitoring in Rehabilitated Channels and Lakes. Parameters put in brackets are not including anymore to the programme**

<table>
<thead>
<tr>
<th>Water analyses</th>
<th>Sediment analyses</th>
<th>Heavy metals from sediment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Moisture content</td>
<td>Arsenic</td>
</tr>
<tr>
<td>pH</td>
<td>Volatile solids</td>
<td>Cadmium</td>
</tr>
<tr>
<td>Conductivity</td>
<td>Total solids</td>
<td>Total Chromium</td>
</tr>
<tr>
<td>Turbidity</td>
<td>Density</td>
<td>Chromium (Lead)</td>
</tr>
<tr>
<td>BOD$_3$</td>
<td>Total Nitrogen</td>
<td>Mercury</td>
</tr>
<tr>
<td>COD</td>
<td>Total Phosphorus</td>
<td>(Nickel)</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>(COD)</td>
<td>(Zinc)</td>
</tr>
<tr>
<td>Total Phosphorus</td>
<td>(Ammonium (NH$_4^+$))</td>
<td></td>
</tr>
<tr>
<td>(Nitrate (NO$_3^-$))</td>
<td>Sulphate (SO$_4^{2-}$)</td>
<td></td>
</tr>
<tr>
<td>(Ammonium (NH$_4^+$))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulphate (SO$_4^{2-}$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faecal coliform</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sampling is proposed to be done annually once per dry season and once per rainy season. The samples have been taken twice per year starting from November 2001.

**Flooding indicators** are as follows: rainfall, tide, level of floodwater and water level in lakes and channels in the including to the project area. Planning department of
SADCo is measuring flood depth and time from 20 locations in Hong Bang district, 14 locations in Ngo Quyen district and 8 locations in Le Chan district.

Hydrological monitoring includes water level measurements at totally eleven points of which seven are in North-East Channel system and four in South-West Channel system. There are already now water level gauge boards at all tidal gates and it has been agreed that WSDSSMP will install the water level gauges to the proposed locations along lakes and channels. The installation time schedule depends on the construction of IB Project and other lake improvement projects.

**Groundwater level monitoring** will be done according to the need before and during construction of big sewers.

**Health indicators:** SADCo PMU is collecting basic disease data from six phuongs. Health indicator survey has been implemented in 2003.

**Household sanitation improvements:** Sanitation conditions have been surveyed in five phuongs. Women's Union will update the results annually.

**Summary of Present Monitoring**

Summary of the proposed monitoring programme of the whole Vietnam: Three Cities Sanitation Project – Haiphong Sub-Project including sludge and septage monitoring in Trang Cat disposal site is presented in Table 5-2. The final content would be updated during the implementation of the project.

**Table 5-2** Summary of Monitoring Programmes of Vietnam: Three Cities Sanitation Project - Haiphong Sub-Project

<table>
<thead>
<tr>
<th>Type of monitoring</th>
<th>Number of samples</th>
<th>Frequency / Phase</th>
<th>Needed equipment</th>
<th>Responsible organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety during construction</td>
<td>Lot</td>
<td>During the work / Construction</td>
<td></td>
<td>Contractor</td>
</tr>
<tr>
<td>Safety during operation</td>
<td>Lot</td>
<td>During the work / operation</td>
<td>Gas detector Decibel meter</td>
<td>SADCo</td>
</tr>
<tr>
<td>Lake and channel</td>
<td>4 in lakes 6 in channels</td>
<td>2 / year operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Sludge</td>
<td>1 raw sludge 1 treated</td>
<td>2 / year operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Leachate</td>
<td>1 from pond 1 effluent</td>
<td>1 / month operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Groundwater in Trang Cat</td>
<td>Borehole</td>
<td>2 / year operation</td>
<td></td>
<td>SADCo / Hired laboratory</td>
</tr>
<tr>
<td>Hydrological Monitoring</td>
<td>Lot</td>
<td>1 / day during dry season / operation 1 / hour during rainy season / operation</td>
<td>Water level gauges</td>
<td>SADCo</td>
</tr>
</tbody>
</table>
5.2 Proposed Monitoring Programme for VUUP Haiphong Sub-Project

The proposal to follow and monitor the Project in the communities is according to the Data for Environmental Impact Assessment and CUPs as follows:

Table 5-3 Environmental monitoring during construction

<table>
<thead>
<tr>
<th>Upgrading activities</th>
<th>What to monitor</th>
<th>How often</th>
<th>How</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply</td>
<td>Excavated soil</td>
<td>Twice a week</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Roads</td>
<td>Dust</td>
<td>Every day</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>At night time</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Drainage</td>
<td>Excavated soil</td>
<td>Every day</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>At night time</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Sludge dredging</td>
<td>Sludge</td>
<td>2 days</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>District officer</td>
<td>2 days</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>District officer</td>
<td>2 weeks</td>
<td>Inspection</td>
<td>URENCO</td>
</tr>
</tbody>
</table>

Table 5-4 Environmental monitoring during operation

<table>
<thead>
<tr>
<th>Upgrading activities</th>
<th>What to monitor</th>
<th>How often</th>
<th>How</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply</td>
<td>Quality</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td>Drainage</td>
<td>Sediment</td>
<td>6 month</td>
<td>Checking</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Clogging</td>
<td>Every week</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td>Solid waste</td>
<td>Condition around</td>
<td>Every day</td>
<td>Observation</td>
<td>Households nearby</td>
</tr>
<tr>
<td></td>
<td>Transfer site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transport</td>
<td>2 days</td>
<td>Observation</td>
<td>Community leader</td>
</tr>
<tr>
<td></td>
<td>Disposal site</td>
<td>year</td>
<td>Inspection</td>
<td>URENCO</td>
</tr>
<tr>
<td>Air quality</td>
<td>Odour</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td></td>
<td>Smoke</td>
<td>Every day</td>
<td>Observation</td>
<td>Households</td>
</tr>
<tr>
<td></td>
<td>Dust</td>
<td>3 month</td>
<td>Measuring</td>
<td>District officer</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>3 month</td>
<td>Measuring</td>
<td>District officer</td>
</tr>
</tbody>
</table>

It is recommended to include sampling points from An Kim Channel to the existing environmental monitoring programme of SADCo.

The more detailed monitoring programme will be presented in the Final Environmental Impact Assessment Report after the discussion with PMU, communities and SADCo.
6 CAPACITY DEVELOPMENT AND TRAINING

6.1 Implementation Organisation of the Project

It is proposed that project owner, Project Management Unit (PMU), directly manages project implementation process at city level. To support and steer the PMU it is required to set up the Project Steering Unit under Haiphong People's Committee.

The structure of project management and steering organization during the preparation and implementation process is presented as follows:

Figure 6-1 The structure of project management and steering organization

Figure 6-2 Structure of Project Implementation Organisation on Community Level
Identification of the project owner

The Project Management Unit (PMU) has been established as stipulated through the Decision of Haiphong People’s Committee to be the project owner.

WB's recommendations for Project Management Unit

In addition to the roles and responsibilities of the PMU according to Decree 52/CP, it is necessary to point out some concrete requirements for the project.

It is proposed that PMU will be responsible for implementing almost all components of the project. The Component 4 will be assigned to Department of Land and Housing. PMU will delegate Component 5 to Women's Union.

It is essential to strengthen the capacity of PMU staff by recruiting experts who have experiences in procurement, bidding, project management and especially financial management. The PMU may also need additional support from international consultants to ensure that the project will be implemented favourably.

The PMU has to open at least three separate accounts: account for WB funds, counterpart funds and community contributions.

Financial Management system (FMS) need be applied for PMU. The PMU has to establish FMS that is satisfactory to the WB. This will include the items listed below:

- Professionally qualified and appropriately experienced chief accountant (satisfactory to WB's requirements)
- Project FMS manual
- Computerized accounting system with which staff is familiar (hardware, software and training may be needed)
- Reporting system that can provide quarterly project management reports that meet the Bank's reporting requirements.
- Appointment of an independent auditor to prepare annual audits of the project accounts

6.2 Relationship and responsibilities of relevant departments and agencies

The Government of Vietnam will be responsible for receiving fund from the World Bank in the framework of Vietnam Urban Upgrading Project and approve Pre Feasibility Study report of Vietnam Urban Upgrading Project - Haiphong Sub-project and investment allowance.

The World Bank Group in Viet Nam will finance the project through signed agreements; appraise proposals of project on technical and financial aspects and give no-objection letter; review and give no-objection to the invitation for bidding contract packages, and provide and suggest contents of the project.

Haiphong People's Committee will manage Vietnam Urban Upgrading - Haiphong Sub-project; approve feasibility study report and total cost estimates; approve engineering designs and cost estimates of components; decide to set up project steering unit and project management unit; decide investment; mobilize state capital sources including local funds and fund contributed by people to project proportionally divide responsibility for all works of Haiphong sub-project on the behalf of the Government; and provide documents and figures related to project.

People's Committee of Districts, Wards and Communes related to the project will manage project's works in relation with each local area and be responsible for those works with superior People's Committee; support, create good conditions for relevant units and departments to implement works of the project; take over and manage construction components after construction of the project in accordance of committed responsibility; and mobilize contributed funds from households in low-income areas for project's expenditure.

Planning Group in low-income areas will be in charge of Community for project's works related to low-income areas; and participate in planning and guiding communities to contribute ideas to the contents of community upgrading plan and other works of project.

Project management unit (PMU) is Project owner (Part A) under the direct management of Haiphong People's Committee, and is responsible for all works related to project such as preparation, engineering design, construction, preparing balance-sheet, inauguration, transferring to other units; and contact with concerned parts in works of project.

Low-income communities will be direct beneficiary from project; and be responsible for participating to project through following works: consult for plans of project, contribute to project by cash and other means, and take part in managing and operation and maintenance after construction.
Non-government organizations at all levels on behalf of communities, they should be responsible for supporting communities in relevant works of project in their area and locality based on their experiences and prestige.

6.3 Training during Design, Construction and Operation Phase

During the preparation of the Draft Environmental Management Plan the CEMP including to the Project Operations Manual was not available, yet, and therefore it was not known what kind of environmental training has been planned for the communities.

However, for the needs of next phases of the project it should include environmental training for both PMU and community level. The training should include at least the following:

**Environmental Training courses for PMUs**

Part 1: Prepare reports on the environmental status quo
- Introduction including the preparation of reports; target, specific characteristics, and principles to prepare reports on the environmental status
- Institutional considerations
- Establish database for the preparation of the Report of Environmental Status Quo including the data subject, data base development, spatial data, and construction of the environmental information system.
- Environmental instructions
- Environmental status quo when carrying out the project

Part 2: Environmental Impact Assessment (EIA)
- Overviews of EIA including the birth, necessity, objects, contents and requirements of EIA
- Implementation process of EIA: including the preparation, appraisal and implementation process of EIA in Viet Nam
- Impact evaluation towards environmental elements: including elements as air, soil, water, noise, biological environment, solid waste, cultural and socio-economic environment
- Technical approaches of EIA
- Socio-economic angle of EIA
- EIA for a project: for example the rails and roads' construction project and new urban construction project of the main point economic area
- Stipulation and guidance on EIA of international organizations: including 10 safe policies of the WB and guidance of EIA of other international organizations

**Environmental Training courses for communities**

Contents of the training course are similar but simpler than the training course for PMUs.

Part 1: Preparation of EIA report – also having items 1, 4, 5 (introduction, instructions and situation) but no having item 3 (data base establishment) and in item 2: reducing the “planning” and “task” section.
Part 2: Impact Evaluation on environment – also having items 1, 3 (overviews, evaluation) but no having items 2, 4, 6, 7; and in item 5: only retaining 2 sections as “evaluation on social impacts” and “roles of the masses”.

During the development process of the Phase II – Component I (Tertiary Infrastructure Upgrading) as well as when developing similar projects, all activities are wished to carry out correctly following stages as mentioned above. When developing next stages, similar projects should base on specific situation to modify approaches and development methods suitably.

The more detailed environmental training plan will be presented in the Final Environmental Management Plan.
7 IMPLEMENTATION SCHEDULE AND COST ESTIMATES

7.1 Implementation plan of components of Phase 1

The detailed plans for project actions are indicated in the Aide Memoire signed between the WB and Haiphong People's committee. The proposed deadlines of the project are as follows:

Table 7-1 Time schedule of the Project

<table>
<thead>
<tr>
<th>Action</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval of FS in Phase I</td>
<td>July, 2003</td>
</tr>
<tr>
<td>Appraisal of FS in Phase I</td>
<td>October - November, 2004</td>
</tr>
<tr>
<td>Submission FS to WB</td>
<td>March, 2004</td>
</tr>
<tr>
<td>Project come in to effect</td>
<td>June, 2004</td>
</tr>
<tr>
<td>Approval of detailed designs for component 1</td>
<td>December, 2003</td>
</tr>
<tr>
<td>Approval of detailed designs for component 2</td>
<td>May, 2004</td>
</tr>
<tr>
<td>Finish bidding for contract packages of component 1</td>
<td>March, 2004</td>
</tr>
<tr>
<td>Finish international bidding for contract packages of</td>
<td>July, 2004</td>
</tr>
<tr>
<td>component 2</td>
<td></td>
</tr>
<tr>
<td>Start construction for component 1</td>
<td>April, 2004</td>
</tr>
<tr>
<td>Finish construction for component 1</td>
<td>September, 2006</td>
</tr>
<tr>
<td>Start construction for component 2</td>
<td>September, 2004</td>
</tr>
<tr>
<td>Finish construction for component 2</td>
<td>September, 2007</td>
</tr>
<tr>
<td>Completion of phase 1 of the project</td>
<td>December, 2007</td>
</tr>
</tbody>
</table>

7.2 Cost Estimation

Based on the data of Pre-Feasibility study approved by the Government of Vietnam and cost estimates for the phase 1 of the project, total investment cost of the whole project is presented as follows:

Table 7-1 Total investment cost and financial schedule - Phase 1, September 2003

<table>
<thead>
<tr>
<th>Components</th>
<th>Cost VND mill</th>
<th>IDA loan USD</th>
<th>Local budget VND mill</th>
<th>Community contribution VND mill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary infrastructure</td>
<td>33.164</td>
<td>2.167.573</td>
<td>28.517</td>
<td>926</td>
</tr>
<tr>
<td>Component 1: Tertiary infrastructure</td>
<td>33.164</td>
<td>2.167.573</td>
<td>28.517</td>
<td>926</td>
</tr>
<tr>
<td>Component 2: Primary and secondary</td>
<td>186.652</td>
<td>12.199.506</td>
<td>160.317</td>
<td>1.721.261</td>
</tr>
<tr>
<td>infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component 3: Housing for the poor</td>
<td>157.239</td>
<td>10.277.050</td>
<td>75.631</td>
<td>5.333.853</td>
</tr>
<tr>
<td>Component 4: Land and house</td>
<td>7.647</td>
<td>499.810</td>
<td>7.210</td>
<td>28.568</td>
</tr>
</tbody>
</table>
### Component 5: Revolving funds for housing improvements

<table>
<thead>
<tr>
<th></th>
<th>23.780</th>
<th>1.554,248</th>
<th>23.780</th>
<th>1.554,248</th>
</tr>
</thead>
</table>

### Component 6: Technical assistance for the whole project

<table>
<thead>
<tr>
<th></th>
<th>19.632</th>
<th>1.283,126</th>
<th>18.181</th>
<th>1.188,297</th>
<th>1.451</th>
<th>94.829</th>
</tr>
</thead>
</table>

| Total cost     | 428,114 | 27.981,312 | 313,636 | 20.499,079 | 113,652 | 7.421,718 | 926 | 60,516 |
| %              | 100     | 100        | 73,260  | 73,260     | 26,524  | 26,524    | 0,216 | 0,216   |

During the preparation of draft environmental report the PMU informed that there would be some changes in how to present and divide the financial tables. Therefore, the more detailed cost estimations and mitigation costs will be given only in the Final Environmental Management Plan.

### 7.3 Investment capital source

Project has received the support from World Bank by a loan for Vietnam Government. There is also a non-refunding grant from Japanese Government for project preparation; counterpart funds, including local budget and people’s contribution.

Financial schedule is as follows:

- **IDA loan**: about 90% of total cost for construction, procurement and equipment.
- **Counterpart funds**: at least 10% of total cost
  - **Local budget**: at least 6.2% 
  - **Community contribution**: at least 3.8% for Component 1
  - **Compensation cost for land and housing of project affected households and other costs
  - **Other funds**: a grant from Japanese Government for project preparation
8 ENVIRONMENTAL REPORTING

Environmental reporting is a part of biannual review of the progress of the project. In environmental chapter should be described the main results of the monitoring and possible changes and justifications from the agreed programme. In the environmental section should be handled the monitoring of the main components i.e. water supply, drainage and alleys.

Different level of organisations should prepare their own reports and PMU would then compile these sub-reports to the environmental section of biannual report. The reporting chain is as follows:

- Communities report the grass root level environmental activities, monitoring and possible problems according to the monitoring programme agreed in CEMPs
- Wards collect the data from LIAs including to their area
- Districts collect the data from wards and submit the data to PMU
- Companies responsible for O&M will collect data from their activities and submit the data to PMU
- PMU compile the environmental data and add it the to biannual progress report which is submitted to the WB
- DONRE has the overall management responsibility of environmental issues and biannual report has to be submitted also to them
ANNEX I

Basic Information about the Selected Low-income Areas (LIAs)
List of 8 low-income communities proposed to be included in the project Phase 1

<table>
<thead>
<tr>
<th>No</th>
<th>Low income areas and clustering level</th>
<th>Wards/ communes</th>
<th>No of LIA</th>
<th>Area (km²)</th>
<th>Population</th>
<th>No of HHs</th>
<th>Construction phases</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>An Hai district</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Hang Kenh 1+3, Trai Le</td>
<td>Du Hang Kenh</td>
<td>3</td>
<td>0.145</td>
<td>3003</td>
<td>729</td>
<td>Phase 1</td>
</tr>
<tr>
<td>II</td>
<td>Kien An district</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Areas: 4+5+6</td>
<td>Trang Minh</td>
<td>3</td>
<td>0.212</td>
<td>3242</td>
<td>801</td>
<td>Phase 1</td>
</tr>
<tr>
<td>III</td>
<td>Hong Bang district</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Area: C</td>
<td>Trai Chuoi</td>
<td>1</td>
<td>0.065</td>
<td>2008</td>
<td>522</td>
<td>Phase 1</td>
</tr>
<tr>
<td>IV</td>
<td>Le Chan district</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Area 8 (Nghia Dia Tay)</td>
<td>Cat Dai</td>
<td>1</td>
<td>0.023</td>
<td>1960</td>
<td>467</td>
<td>Phase 1</td>
</tr>
<tr>
<td>22</td>
<td>Area 8</td>
<td>Tran Nguyen Han</td>
<td>1</td>
<td>0.011</td>
<td>1294</td>
<td>310</td>
<td>Phase 1</td>
</tr>
<tr>
<td>23</td>
<td>Areas: 3+5+7+8</td>
<td>Niem Nghia</td>
<td>4</td>
<td>0.056</td>
<td>2053</td>
<td>561</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Ngo Quyen district</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Areas: T1+T2+T3</td>
<td>Cat Bi</td>
<td>1</td>
<td>0.116</td>
<td>7257</td>
<td>1556</td>
<td>Phase 1</td>
</tr>
<tr>
<td>33</td>
<td>May Chai, May Dien, Thuy Tinh</td>
<td>May Chai</td>
<td>3</td>
<td>0.059</td>
<td>4903</td>
<td>1255</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>17</td>
<td>0.687</td>
<td>25720</td>
<td>6201</td>
<td></td>
</tr>
</tbody>
</table>

September 2003
Summary of Investment Process for 42 Low-income Areas in Three Phases

<table>
<thead>
<tr>
<th>Districts</th>
<th>No of LIA</th>
<th>Phase 1</th>
<th></th>
<th>Phase 2</th>
<th></th>
<th>Phase 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Area</td>
<td>No of hhs</td>
<td>Population</td>
<td>Area</td>
<td>No of hhs</td>
<td>Population</td>
</tr>
<tr>
<td>An Hai</td>
<td>33</td>
<td>0.145</td>
<td>729</td>
<td>3003</td>
<td>1,289</td>
<td>8765</td>
<td>31442</td>
</tr>
<tr>
<td>Kien An</td>
<td>39</td>
<td>0.212</td>
<td>801</td>
<td>3242</td>
<td>1,086</td>
<td>7444</td>
<td>10157</td>
</tr>
<tr>
<td>Hong Bang</td>
<td>22</td>
<td>0.065</td>
<td>522</td>
<td>2008</td>
<td>3,422</td>
<td>4190</td>
<td>17079</td>
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<tr>
<td>Le Chan</td>
<td>19</td>
<td>0.0904</td>
<td>1338</td>
<td>5307</td>
<td>0,258</td>
<td>3279</td>
<td>13564</td>
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<tr>
<td>Ngo Quyen</td>
<td>26</td>
<td>0.1746</td>
<td>2811</td>
<td>12160</td>
<td>0.485</td>
<td>877</td>
<td>4228</td>
</tr>
<tr>
<td>Total</td>
<td>139</td>
<td>0.687</td>
<td>6201</td>
<td>25720</td>
<td>6,54</td>
<td>24555</td>
<td>76470</td>
</tr>
</tbody>
</table>

September 2003
### Summary of low-income communities

**Tertiary technical infrastructure – whole city**

<table>
<thead>
<tr>
<th>No</th>
<th>Location</th>
<th>Population Density (person/km²)</th>
<th>Living area (km²)</th>
<th>Population (person)</th>
<th>No of households (hhs)</th>
<th>Surveying criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Class 4 house (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Temporary house (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lanes &lt;2m (m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lanes 2m-3m (m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lanes &gt;4m (m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dirt, gravel, pebble road (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Degraded road (m)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HHs w/o electric meter (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HHs w/o water meter (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HHs w/o drains (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HHs w/o septic tank (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HHs w/o solid waste collection (%)</td>
</tr>
<tr>
<td>1</td>
<td>Whole city</td>
<td>216.15 9</td>
<td>7,772</td>
<td>184.384</td>
<td>46.222</td>
<td>320.37</td>
</tr>
<tr>
<td>2</td>
<td>An Hai</td>
<td>27922</td>
<td>2,09</td>
<td>47555</td>
<td>12388</td>
<td>70.6</td>
</tr>
<tr>
<td>3</td>
<td>Kien An</td>
<td>48.852</td>
<td>1,773</td>
<td>45439</td>
<td>11611</td>
<td>66.5</td>
</tr>
<tr>
<td>4</td>
<td>Hong Bang</td>
<td>38880</td>
<td>2,442</td>
<td>31044</td>
<td>7545</td>
<td>66.47</td>
</tr>
<tr>
<td>5</td>
<td>Le Chan</td>
<td>57573</td>
<td>0.553</td>
<td>21106</td>
<td>5313</td>
<td>56.20</td>
</tr>
<tr>
<td>6</td>
<td>Ngo Quyen</td>
<td>42.932</td>
<td>0.914</td>
<td>39240</td>
<td>9365</td>
<td>60.6</td>
</tr>
</tbody>
</table>

September 2003
## Summary of low-income areas

### Socio-economy infrastructure and environment - whole city

<table>
<thead>
<tr>
<th>No</th>
<th>Location</th>
<th>Area (km²)</th>
<th>Population (person)</th>
<th>No of households (hhs)</th>
<th>Average income (person/month)</th>
<th>Baby care house + kindergarten</th>
<th>Health care station</th>
<th>Market+service centre</th>
<th>Primar y and secondary school</th>
<th>Pollutio n by floodin g</th>
<th>Water polluti on</th>
<th>Air polluti on</th>
<th>Noise pollution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Whole city</td>
<td>216.159</td>
<td>7,772</td>
<td>184,384</td>
<td>118.06</td>
<td>21</td>
<td>43</td>
<td>18</td>
<td>11</td>
<td>41</td>
<td>Yes</td>
<td>heavy</td>
<td>Aver.</td>
</tr>
<tr>
<td>2</td>
<td>An Hai</td>
<td>2.09</td>
<td>47,555</td>
<td>12.388</td>
<td>125.000</td>
<td>7</td>
<td>13</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>Yes</td>
<td>heavy</td>
<td>heavy</td>
</tr>
<tr>
<td>3</td>
<td>Kien An</td>
<td>1,773</td>
<td>45,439</td>
<td>11,611</td>
<td>102,000</td>
<td>9</td>
<td>19</td>
<td>6</td>
<td>3</td>
<td>21</td>
<td>Yes</td>
<td>Aver.</td>
<td>Aver.</td>
</tr>
<tr>
<td>4</td>
<td>Hong Bang</td>
<td>2.42</td>
<td>310,44</td>
<td>7,545</td>
<td>152,000</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>8</td>
<td>heavy</td>
<td>Aver.</td>
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</tr>
<tr>
<td>5</td>
<td>Le Chan</td>
<td>0.553</td>
<td>211,06</td>
<td>5,313</td>
<td>101,000</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>heavy</td>
<td>Aver.</td>
<td>heavy</td>
</tr>
<tr>
<td>6</td>
<td>Ngo Quyen</td>
<td>0.914</td>
<td>392,40</td>
<td>9,365</td>
<td>110,000</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>Aver.</td>
<td>Aver.</td>
<td>Aver.</td>
</tr>
</tbody>
</table>

September 2003
ANNEX 2

COMPONENT 1: TERTIARY INFRASTRUCTURE
ACCORDING TO CUPs
## COMMUNITY UPGRADING PLANS
### UPGRADED AMOUNT OF TERTIARY TECHNICAL INFRASTRUCTURE

<table>
<thead>
<tr>
<th>No</th>
<th>District (ward, and commune)</th>
<th>Lanes (m)</th>
<th>Electric lines and meters (unit)</th>
<th>Street lighting (pole)</th>
<th>Water pipes and meters (unit)</th>
<th>Drains (m)</th>
<th>Solid waste canned carts (cart)</th>
<th>Solid waste collection (container)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>City (8 wards, communes)</td>
<td>6.500</td>
<td>24.400</td>
<td>208</td>
<td>23.200</td>
<td>40</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>An Hai district (1 commune)</td>
<td>2.000</td>
<td>3.500</td>
<td>50</td>
<td>5.000</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Plan 1: Du Hang Kenh</td>
<td>2.000</td>
<td>3.500</td>
<td>50</td>
<td>5.000</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Kien An district (1 ward)</td>
<td>2.000</td>
<td>3.500</td>
<td>60</td>
<td>6.000</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Plan 2: Trang Minh</td>
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<td>3.500</td>
<td>60</td>
<td>6.000</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Hong Bang district (1 ward)</td>
<td>350</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>I</td>
<td>Plan 3: Trai Chuoi</td>
<td>350</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Le Chan district (3 wards)</td>
<td>850</td>
<td>10.550</td>
<td>30</td>
<td>8.000</td>
<td>6</td>
<td></td>
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</tr>
<tr>
<td>I</td>
<td>Plan 4: Niem Nghia</td>
<td>600</td>
<td>8.000</td>
<td></td>
<td>8.000</td>
<td>5</td>
<td>4</td>
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</tr>
<tr>
<td>II</td>
<td>Plan 5: Tran Nguyen Han</td>
<td>1.700</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>III</td>
<td>Plan 6: Cat Dai</td>
<td>250</td>
<td>850</td>
<td>30</td>
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<tr>
<td>V</td>
<td>Ngo Quyen district (2 wards)</td>
<td>1.650</td>
<td>6.500</td>
<td>68</td>
<td>3.000</td>
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<tr>
<td>I</td>
<td>Plan 7: Cat Bi</td>
<td>550</td>
<td>3.500</td>
<td>68</td>
<td>1.500</td>
<td>5</td>
<td>4</td>
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</tr>
<tr>
<td>II</td>
<td>Plan 8: May Chai</td>
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<td>3.000</td>
<td></td>
<td>1.500</td>
<td>5</td>
<td>3</td>
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September 2003
### COMMUNITY UPGRADING PLANS

#### UPGRADED AMOUNT OF TERTIARY TECHNICAL INFRASTRUCTURE

<table>
<thead>
<tr>
<th>№</th>
<th>District (ward, commune)</th>
<th>Kindergartens</th>
<th>Health clinics</th>
<th>I, II schools</th>
<th>Site for cultural activities</th>
<th>Service - market activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Improved</td>
<td>Improved</td>
<td>Improved</td>
<td>Improved</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New</td>
<td>New</td>
<td>New</td>
<td>New</td>
<td>New</td>
</tr>
<tr>
<td>1</td>
<td>City (7 wards, communes)</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>An Hai district (1 commune)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 1: Du Hang Kenh</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Kien An district (1 ward)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 2: Trang Minh</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Hong Bang district (1 ward)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 3: Trai Chuoi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Le Chan district (3 wards)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 4: Niem Nghia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 5: Tran Nguyen Han</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 6: Cat Dai</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Ngo Quyen district (2 wards)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 7: Cat Bi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan 8: May Chai</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

September 2003
ANNEX 3

Environmental Impacts of the Proposed Components of Phase 1
### Annex 3.1 Identification, Management and Monitoring of Impacts related to Component 1: Roads

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Emissions during Construction</strong></td>
<td>Vicinity of construction equipment</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the construction equipment and traffic will have a small and a short-term effect on local air quality and an infinitesimal effect on global greenhouse gases. Dust emissions from traffic related to construction works.</td>
<td>No measures necessary.</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Noise during Construction</strong></td>
<td>Vicinity of construction equipment</td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995)</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td></td>
<td>Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air Emissions and Noise during Operation</strong></td>
<td>Local</td>
<td>Most probably traffic will increase and therefore amount of air emissions, noise and traffic jams will be increased.</td>
<td>Avoid by-passing traffic, only local traffic. Avoid to use low-quality motorbikes causing high amount of air emissions.</td>
<td>Long-term permanent impacts.</td>
<td>Regular air quality monitoring along the busiest alleys.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social and Financial Impacts</strong></td>
<td>Local</td>
<td>Access to houses will be improved and more possibilities for small-scale business. Bottlenecks in traffic will be decreased and traffic will flow smoothly. Number of traffic accidents might increase due to the increased traffic volume.</td>
<td>Traffic education to everybody but especially for children at kindergarten and schools.</td>
<td>Long-term permanent impacts.</td>
<td>Regular follow-up of number of traffic accidents in community level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Annex 3.2 Identification, Management and Monitoring of Impacts related to Component 1: Street Lighting

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Emissions during Construction</td>
<td>Vicinity of construction equipment. Local</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.</td>
<td>No measures necessary.</td>
<td>Minimal impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Noise during Construction</td>
<td>Vicinity of construction equipment. Local</td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Construction and Operation of Street Lighting Supply System</td>
<td>Local</td>
<td>Improvement of security and safety situation and decrease of accidents due to the better lighting during evening and night. Improvement of possibilities for legal business life.</td>
<td>Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed. During operation O&amp;M has to be done, immediate repairing of broken lamps or any other breakages.</td>
<td>Long-term positive impacts.</td>
<td>Construction management supervision. Operation monitored on the community level.</td>
</tr>
</tbody>
</table>
## Annex 3.3 Identification, Management and Monitoring of Impacts related to Component 1: Water Supply

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Emissions during Construction</strong></td>
<td>Vicinity of construction equipment</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.</td>
<td>No measures necessary.</td>
<td>Minimal impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td><strong>Noise during Construction</strong></td>
<td>Vicinity of construction equipment. Local</td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td><strong>Construction and Operation of Water Supply System</strong></td>
<td>Local</td>
<td>Improvement of hygienic and health situation due to the stable and sufficient water supply.</td>
<td>Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed. During operation no illegal connections allowed to protect water supply network.</td>
<td>Long-term positive impacts.</td>
<td>Construction management supervision. Water quality in the network monitored. Sustainability of water supply monitored on the community level.</td>
</tr>
</tbody>
</table>
### Annex 3.4 Identification, Management and Monitoring of Impacts related to Component 1: Drainage and Sewerage

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Emissions during Construction</td>
<td>Vicinity of construction equipment</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.</td>
<td>No measures necessary.</td>
<td>Minimal impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise during Construction</td>
<td>Vicinity of construction equipment</td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995)  Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction and Operation of Drainage</td>
<td>Local along the alleys</td>
<td>Overall improvement of drainage system. Decrease of flooding. Improved hygienic and environmental conditions.</td>
<td>Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed. During operation regular cleaning of drains. Solid waste management along the drains has to be organised to stop people throwing garbage on drains.</td>
<td>Major positive impact on the overall environmental and hygienic conditions. Long-term positive impacts. Short-term negative impacts during construction and dredging.</td>
<td>Construction management supervision. Regular monitoring of conditions of drainage system including amount of garbage on drains.</td>
</tr>
</tbody>
</table>
### Annex 3.5 Identification, Management and Monitoring of Impacts related to Component 1: Solid Waste Collection

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Emissions during operation</td>
<td>Vicinity of collection sites Local</td>
<td>Possible emission of methane on local air quality and an infinitesimal effect on global greenhouse gases. Foul odour next to collection site.</td>
<td>No measures necessary. Community groups have to select location of collection sites to avoid complaints. Sites have to be kept clean to avoid odour problems.</td>
<td>Minimal impacts.</td>
<td>Not required. Community level monitoring of cleanliness and odour of sites.</td>
</tr>
<tr>
<td>Operation of collection sites</td>
<td>Vicinity of collection sites Local</td>
<td>Permanent impact on the vicinity of collection sites. Increase of traffic. Possible foul odour and increase of insects, rats and vermin.</td>
<td>Community groups have to select location of collection sites to avoid complaints. There should be easy access to everybody. Containers have to be big enough and emptied regularly to avoid spreading solid waste into surroundings. People have to be trained how to use sorting system and what is the meaning of different containers. Sites have to be kept clean to avoid odour and vermin problems</td>
<td>Permanent both positive and negative impacts.</td>
<td>Community level monitoring of cleanliness, odour and vermin. Monitoring of emptying of containers.</td>
</tr>
</tbody>
</table>

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## Annex 3.6 Identification, Management and Monitoring of Impacts related to Component 1: Kindergarten, Schools and Cultural Houses

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Emissions during Construction</td>
<td>Vicinity of construction site. Local</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation installation and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.</td>
<td>No measures necessary.</td>
<td>Minimal impacts during construction.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Noise during Construction</td>
<td>Vicinity of construction site. Local</td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them. Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed.</td>
<td>Short-term impacts during construction</td>
<td>Not required.</td>
</tr>
<tr>
<td>Operation</td>
<td>Vicinity of facilities. Local, regional</td>
<td>Overall improvement of social infrastructure of the area. Improvement of education level has long-term positive impacts. Increase of traffic around the facilities increases the possibility of traffic accidents.</td>
<td>O&amp;M of the facilities has to be organised, and possible breakages repaired immediately. Surroundings of the facilities have to be kept clean and tidy.</td>
<td>Major permanent positive impact on the overall social conditions.</td>
<td>Regular monitoring of conditions of facilities on community level.</td>
</tr>
</tbody>
</table>

September 2003
### Annex 3.7 Identification, Management and Monitoring of Impacts related to Component 2: Upgrading of An Kim Hai Channel

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Emissions during Construction</td>
<td>Vicinity of construction equipment Local</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases. Possible foul odour from sediment during dredging.</td>
<td>No measures necessary.</td>
<td>Minimal impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Noise during Construction</td>
<td>Vicinity of construction equipment Local</td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Construction and Operation of Drainage</td>
<td>Local along the channel</td>
<td>Overall improvement of drainage system. Decrease of flooding. Improved hygienic and environmental conditions.</td>
<td>Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed.</td>
<td>Major positive impact on the overall environmental and hygienic conditions. Long-term positive impacts. Short-term negative impacts during construction and dredging.</td>
<td>Construction management supervision. Regular monitoring of conditions of drainage system.</td>
</tr>
</tbody>
</table>

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### Annex 3.8 Identification, Management and Monitoring of Impacts related to Component 2: Roads in An Kim Hai Area

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Emissions during Construction</strong></td>
<td>Vicinity of construction equipment</td>
<td><strong>Local</strong></td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the construction equipment and traffic will have a small and a short-term effect on local air quality and an infinitesimal effect on global greenhouse gases. Dust emissions from traffic related to construction works.</td>
<td>No measures necessary.</td>
<td>Short-term impacts.</td>
</tr>
<tr>
<td><strong>Noise during Construction</strong></td>
<td>Vicinity of construction equipment.</td>
<td><strong>Local</strong></td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td>Short-term impacts</td>
</tr>
<tr>
<td><strong>Air Emissions and Noise during Operation</strong></td>
<td>Local</td>
<td>Most probably traffic will increase and therefore amount of air emissions, noise and traffic jams will be increased.</td>
<td>Avoid by-passing traffic, only local traffic. Avoid to use low-quality motorbikes causing high amount of air emissions.</td>
<td>Long-term permanent impacts.</td>
<td>Regular air quality monitoring along the roads.</td>
</tr>
<tr>
<td><strong>Social and Financial Impacts</strong></td>
<td>Local</td>
<td>Access between different areas and access to houses will be improved and more possibilities for small-scale business. Bottlenecks in traffic will be decreased and traffic will flow smoothly. Number of traffic accidents might increase due to the increased traffic volume.</td>
<td>Traffic education to everybody but especially for children at kindergarten and schools.</td>
<td>Long-term permanent impacts.</td>
<td>Regular follow-up of number of traffic accidents in community level.</td>
</tr>
</tbody>
</table>
## Annex 3.9 Identification, Management and Monitoring of Impacts related to Component 2: Street Lighting in An Kim Hai Area

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Emissions during Construction</td>
<td>Vicinity of construction equipment</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.</td>
<td>No measures necessary.</td>
<td>Minimal impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Noise during Construction</td>
<td>Vicinity of construction equipment. Local</td>
<td>Short-term noise associated with construction works. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Construction and Operation of Lighting System</td>
<td>Local</td>
<td>Improvement of security and safety situation and decrease of accidents due to the better lighting during evening and night. Improvement of possibilities for legal business life.</td>
<td>Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed. During operation O&amp;M has to be done, immediate repairing of broken lamps or any other breakages.</td>
<td>Long-term positive impacts.</td>
<td>Construction management supervision. Operation monitored on the community level.</td>
</tr>
</tbody>
</table>
### Annex 3.10 Identification, Management and Monitoring of Impacts related to Component 3: Resettlement Site

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selection and Design of Resettlement Site</td>
<td>Local</td>
<td>Need of resettlement in the proposed area.</td>
<td>Resettlement site has to be located in sparsely populated area to avoid additional need of resettlement. However, site has to be close enough to the area from where the PAPs are relocated to avoid social problems. Design of site has to be done according to the agreed design standards and regulations. Surrounding land use and facilities have to be considered.</td>
<td>Short-term impacts.</td>
<td>Instructions given in RAP have to be followed.</td>
</tr>
<tr>
<td>Air Emissions during Construction</td>
<td>Vicinity of construction equipment Local</td>
<td>Minimal emissions of NOx, CO, CO2 and particulates from the engines of the rehabilitation equipment and traffic will have a small and a short term effect on local air quality and an infinitesimal effect on global greenhouse gases.</td>
<td>No measures necessary.</td>
<td>Minimal impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Noise during Construction</td>
<td>Vicinity of construction site. Local</td>
<td>Short-term noise associated with construction. Short-term noise effect in populated areas.</td>
<td>Avoid working in residential areas during the night between 10 p.m. to 6 a.m. (TCVN 5949-1995) Minimise construction noise by using anti-vibration mountings and noise insulation on equipment whenever possible. The contractor has to provide ear protectors for workers when noise level in the working place exceeds 85 dB and train how to use them.</td>
<td>Short-term impacts.</td>
<td>Not required.</td>
</tr>
<tr>
<td>Construction of Resettlement Site</td>
<td>Local</td>
<td>Short-term impacts during construction.</td>
<td>Construction has to be done according to the Bidding Documents. Regulations given in General Specification of Bidding Documents concerning protection of construction sites, working conditions and safety regulations have to be followed. All planned facilities and services have to be constructed.</td>
<td>Long-term positive impacts.</td>
<td>Construction management supervision.</td>
</tr>
</tbody>
</table>

September 2003
## Annex 3.10 Identification, Management and Monitoring of Impacts related to Component 3: Resettlement Site

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>EXTENT</th>
<th>POTENTIAL IMPACTS</th>
<th>MANAGEMENT MEASURES</th>
<th>NET EFFECTS</th>
<th>MONITORING, FOLLOW-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation of Resettlement Site</td>
<td>Long-term local.</td>
<td>Significant improvement of living conditions of PAPs due to the proper infrastructure and services. Establishment of new social network and business life takes time.</td>
<td>No measures necessary.</td>
<td>Very positive long-term impacts.</td>
<td>Follow-up of social adaptation to the new living area on the community level.</td>
</tr>
</tbody>
</table>

September 2003
LOCATION OF PROJECT AREAS OF HAIPHONG SUB-PROJECT IN PHASE 1 AND 2

CHU THICH (LEGEND):

- KINH DÁN CƯ HUYỆN THUY NGUYEN
- LÔN - INCOME URBAN AREA PHASE 1
- KINH DÁN CƯ HUYỆN THUY NGUYEN
- LÔN - INCOME URBAN AREA PHASE 2
- GIÓ (BORDERS OF PROVINCE)
- BÀN GÓI (BORDERS OF DISTRICT)
- BÀN GÓI (BORDERS OF COMMUNE)
- M-html (DISTRICT PEOPLE'S COMMITTEE)
- M-html (PHARMACY)
- ĐƯỜNG SÀI (BORDER ROAD)
- ĐƯỜNG TRUNG TI (BORDER ROAD)
- ĐƯỜNG ÂM (BORDER ROAD)
- ĐƯỜNG ĐÔNG (BORDER ROAD)
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LOW-INCOME AREAS IN TRANG MINH WARD IN KIEN AN DISTRICT

KHU DÂN CƯ THU NHẬP THẤP PHƯỜNG TRÂNG MINH HUYỆN KIEN AN

CHÚ THỊCH (LEGEND):

- KHU DÂN CƯ THU NHẬP THẤP PHƯỜNG TRÂNG MINH
- QUẢN LỆ CHÂN LÊ CHAN DISTRICT

HISTRIBUTION OF LOW INCOME AREAS IN TRANG MINH WARD

HỘNG BẢNG
HONG BANG DISTRICT

HUYỆN AN LÃO
AN LAO DISTRICT

HUYỆN AN HẢI
AN HAI DISTRICT

HUYỆN KIEN THUY
KIEN THUY DISTRICT

HUYỆN KIEN AN
KIEN AN DISTRICT

PHONG KHOA

BANG HANG DISTRICT
LOW-INCOME AREAS IN TRAI CHUOI WARD IN HONG BANG DISTRICT
KHU DÂN ĂN THU NHẬP THẤP PHƯỜNG TRẠI CHUỐI QUẬN HỒNG BÀNG

CHÚ THỊCH (LEGEND):
- KHU ĐĂN ĂN THU NHẬP THẤP (GIẢI ĐOÁN 1)
- LOW-INCOME URBAN AREA PHASE 1
- RẠNH GÒI TỈNH (BORDERS OF PROVINCE)
- RẠNH GÒI HUYỆN (BORDERS OF DISTRICT)
- RẠNH GÒI XÃ (BORDERS OF COMMUNE)
- UBND QUẬN (DISTRICT PEOPLE'S COMMITTEE)
- UBND PHƯỜNG (WARD PEOPLE'S COMMITTEE)
- TRAI BẾN THI: TRANSFORMER STATION
- B'NH NHÂN (HOSPITAL)
- TRƯỜNG HỌC (SCHOOL)
- ĐỊNH CHÚA (PAGODA)
- BÈN CÂNG (Docks)
- TƯỜNG DẢI, ĐƯỜNG LỘ, BIENER, HEADSTONE
- LANG TÂM (MAUSOLEUM)
- MẶT NƯỚC (WATER SURFACE)
- DƯƠNG GÓI THÔNG THỦY (DESIGNER LINES OF COMMUNICATION)

VIỆTNAM UPGRADEING URBAN PROJECT - HAI PHONG SUB PROJECT
ĐƯỜNG XÂY DỰNG VỆ SINH, VỆ SINH XÂY DỰNG VỆ SINH
LƯƠNG TRAI CHUÔI WARD
KHU DÂN ĂN THU NHẬP THẤP
TRẠI CHUỐI QUẬN HỒNG BÀNG

HÀNH NGHIỆP VĂN CHÍNH
HÀNH NGHIỆP XÂY DỰNG

ĐỒ HỌA: [Signature]

HÀNH NGHIỆP XÂY DỰNG VĂN CHÍNH

HÀNH NGHIỆP VĂN CHÍNH

[Signature]

[Signature]

HP-06
LOW-INCOME AREAS IN CAT BI AND MAY CHAI WARD IN NGO QUYEN DISTRICT
KHU DÂN CU THU NHẬP THẤP PHƯỜNG CÁT BI VÀ MÁY CHAI QUẬN NGO QUYỀN

CHỤ Ý CHỊCH (LEGEND):

- KHU DÂN CU THU NHẬP THẤP (GIAI ĐOẠN 1) - LOW - INCOME URBAN AREA PHASE 1
- RÃNH GÓI HUYỆN (BORDERS OF PROVINCE)
- RÃNH GÓI HUYỆN (BORDERS OF DISTRICT)
- RÃNH GÓI XÃ (BORDERS OF COMMUNE)
- UBND QUẬN (DISTRICT PEOPLE'S COMMITTEE)
- UBND PHƯỜNG (WARD PEOPLE'S COMMITTEE)
- TRẠMN BỆNH THIỆN - TRANSFORMER STATION
- BỆNH VIỆN (HOSPITAL)
- TRƯỜNG HỌC (SCHOOL)
- ĐỀNH CHỦA (PAGODA)
- BẾN CẢNH (INSHAW)
- ĐƯỜNG DẢI BÁI, BERTHAGE, HEADSTONE
- LẠNG TÂM (MAUSOLEUM)
- MẠI NƯỚC (WATER SURFACE)
- ĐƯỜNG GIAO HỘI THỂ KÉ (DESIGNER'S LINES OF COMMUNICATION)