Initial Environmental Examination

October 2014

VIE: Urban Environment and Climate Change Adaptation Project
(Dong Hoi City, Quang Binh Province)

Prepared by Quang Binh Provincial People's Committee for the Asian Development Bank (ADB).

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
BOD5	Biochemical oxygen Demand (5 days)
CC	Climate Change
CCAP	Climate Change Adaptation Plan
CES	Chief Environment & Social (PMU)
CPC	City Peoples Committee
DES	Director Environment & Social (Supervision Engineer)
DOC	Department of Construction
DONRE	Department of Natural Resources and Environment
DPI	Department of Planning and Investment
EA	Executing Agency
EHSC	Environment, Health & Safety Coordinator (Contractor)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
GDP	Gross Domestic Product
IA	Implementing Agency
IEE	Initial Environmental Examination
IPCC	Inter -Governmental Panel on Climate Change
LRAP	Local Resilience Action Plan
MOF	Ministry of Finance
OCR	Ordinary Capital Reserve
PMU	Project Management Unit
PPC	Provincial Peoples Committee
QNWSDC	Quang Nam Water Supply and Drainage Company
RP	Resettlement Plan
SE	Supervision Engineer
SEA	Strategic Environmental Assessment
SUDS	Sustainable Urban Drainage System
UN	United Nations
URENCO	Urban Environment Company
WB	World Bank

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EXECUTIVE SUMMARY

The sub-components of the Urban Environment and Climate Change Adaptation Project selected for Asian Development Bank financing will significantly improve the environmental conditions and quality of life of the population in Dong Hoi through the following results:

- Improvement of the wastewater management for Dong Hoi through complementing the WB on-going project with secondary and tertiary networks; direct benefits are related to (i) improvement of quality of life in the central part of the city, (ii) improvement of public health conditions and (iii) reduction of pollution loads to surface water and underground water.
- Promotion of sustainable urban development for Bao Ninh peninsula in the respect of existing natural resources and hazards;
- Promotion of coastal dune system restoration and rehabilitation with direct benefits related (i) to better protection against natural extreme events (typhoon, flooding from the sea) and (ii) to improvement of biodiversity, both vegetal and animal;
- Reduction of anticipated impacts on land acquisition and involuntary resettlement by revising the road development strategy;
- Promotion of sustainable urban drainage strategy (SUDS) based on maximization of drainage water infiltration with direct benefits (i) on reduction of stormwater drainage investment, (ii) reduction of pollution load to the Nhat Le river and (iii) limiting underground penetration of sea water;
- Contribution to long term economic development of Dong Hoi through the development of new urban areas on Bao Ninh taking due consideration of prevailing climate change risks (sea level rise and flooding) and direct effects on the quality of life of future residents and tourists.

A screening carried out during the Interim phase of the Project confirmed that impacts raised by the project were mainly related to land acquisition while impacts on natural environment were all limited, mainly related to the construction phase and easily controlable by appropriate and conventional mitigation measures. Consequently, the proposed categorisation of the Project was B, involving the preparation of the present IEE. Under GOV regulations, the Subproject is classified as Category “I” and will require a full EIA Report to be appraised and approved by the Quang Binh Province People’s Committee through the Department of Natural Resources and Environment (DONRE). Based on the draft IEE and its EMPs, the full EIA Reports for this Sub-project will be completed by end of February 2014 and submitted to the DONRE for appraisal during March 2014. It is estimated that DONRE appraisal will have been done by mid-May 2014 (or in 30 working days from submission of a complete and valid dossier for appraisal) at the latest; and PPC approval, by first week of June (or in 15 working days from submission of a complete dossier for approval) at the latest

Dong Hoi City is a Class III City with a population of 113,900 (census 2010) targeting Class II City status (population over 200,000) in 2015 or shortly thereafter. It is the administrative capital of Quang Binh Province and is a major economic and tourism center in the northern central region of Vietnam. Dong Hoi City is also an important tourism center with many kilometers of beaches, significant cultural heritage and most importantly the National Garden of Phong Nha - Ke Bang Caves, listed by UNESCO as World Natural Heritage in 2003, located at 50 km in the mountains.

The city is located along the Nhat Le estuary, a river draining a catchment area of 2,650 km². Due to the low and flat topography, to the discharge in the river which drains 77% of the annual runoff during the rainy season from September to December, to the occurrence of typhoons particularly in October and November, Dong Hoi is confronted to recurent floods almost every year, some years exceptional and devastating. Due to the Climate Change, the sea level rise is expected to exacerbate the flood situation in the coming decades.

The overall physical infrastructure to control floods in the Nhat Le river and estuary consists of river and sea dykes, a number of reservoirs, and some retention areas. At many places the existing

dyke crest is about 0.6 to 0.7 m below the design elevation. At present 47 reservoirs have been constructed in the Nhat Le River basin of which 13 reservoirs are located in Dong Hoi City. However, there is no objective nor availability for flood control as the flood storage is too small, and they can only be used for mitigating early floods that have small flood peak discharges.

The project zone mainly consists of urban areas in Dong Hoi and open lands in Bao Ninh considered for urban development. The main natural area, the coastal dune system of Bao Ninh peninsula, has been already affected by on-going resort development, by drainage infrastructure and sand production. In the northern part of the peninsula, vegetation cover of the coastal dune has already been affected by the development works, weakening the protection potential of the dune against coastal erosion and flooding from storm surge. Biodiversity is limited, with only clear Casuarina forest on the dune and related fauna biodiversity is consequently poor.

In general, impacts related to project location will be mainly social and related to land acquisition but contrasted depending the areas concerned. Dong Hoi wastewater sub-component will not involve any impact regarding land acquisition or resettlement as the project is to be constructed wholly in government owned right of way; no building demolition or physical displacement is anticipated.

In Bao Ninh the wastewater component is similarly constructed on government owned land; no building demolition or physical displacement is anticipated. The proposed new urban development and associated stormwater system will concern 16.28 ha of open land including 1.98 ha of ancient graveyards. All the land required is public, belonging to the CPC. No private land acquisition or building demolition is required. A site for the relocation of the graveyards has already been made available by CPC.

Impacts from the road improvement project in Bao Ninh have been drastically reduced by the PPTA team during the mid-term mission from the initial project design which involved more than 200 households most of which requiring physical displacement. The selected road improvement project will affect only 122 households, with the impact concerning only land acquisition and grave relocations.

Impact on natural resources will be limited to the cut of few roadside trees during wastewater sub-component implementation in Dong Hoi. A 1 to 1 replacement policy will be respected. In Bao Ninh future urban development will involve the loss of about 2,000 Casuarina trees (planted species) growing on the landward side of the coastal dune. This loss will be compensated by the development of large green areas already included in the development plan and by the re-vegetation of the dune within the dune restoration and protection component of the project.

Main environmental impacts will happen during the construction activities. Because of project components located in an urban environment (particularly the wastewater component in Dong Hoi) risk of nuisances is higher with traffic congestion, temporary alienation of access, community facilities temporary disruption, noise, engine gas and dust release which may temporary disturb the nearby communities. However, recommendations formulated in the EMP combined with a solid environmental contractual framework and an effective inspection of construction sites will definitely reduce these risks to an acceptable level.

For Bao Ninh stormwater component, the PPTA proposed to rely on SUDS (Sustainable Urban Drainage System) rather than the conventional system initially proposed. A SUDS favors the natural infiltration of water into the ground. Direct benefits include (i) reduction of transfer infrastructures investments, (ii) reduction of pollution load to Nhat Le river and (iii) recharge of the coastal aquifer which limits the penetration of sea water.

The restoration of the coastal dune will improve the protection of the new urban development against sand transport by the wind and against the flooding risk from the sea. Coastal erosion will also be reduced, preserving the beaches and supporting the sustainable development of tourism in Bao Ninh.

No particular impacts, except the benefits listed above, are anticipated after the construction of the project components and during their operation. The road traffic will obviously increase in Bao Ninh

thanks to urban development and to Nhat Le 2 bridge, but with limited impacts for the residents as the main roads are no longer crossing the villages as they do today and these existing roads have not been widened.

Due diligence of EIAs was carried out as part of this IEE for 2 associated facilities to the proposed project: The Duc Ninh WWTP and the Nhat Le 2 bridge, both being under construction. No major issue rose from the environmental point of view.

The IEE provides a full EMP providing organization, roles and responsibilities of parties involved, detailed measures to implement during construction and operation, monitoring and cost estimate.

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1. INTRODUCTION

1.1. PROJECT RATIONALE

Climate Change (CC) is already happening and will affect all countries, with the most serious impacts being felt in developing countries, notably Vietnam. The most likely impacts of CC for Vietnam (those for which models converge) are increases in average temperature, drier dry seasons, wetter wet seasons, an increase of extreme climatic event frequency and an increase in sea level by 2100 (from a baseline of 1980–99) of somewhere between 25 cm and 1 meter, but very possibly toward the higher end of this range.

The government of Vietnam adopted its National Target Program to Respond to Climate Change (NTP-RCC) in December 2008 to determine the consequences of climate change and establish national priorities. The NTP-RCC is the country's guiding document for responding to CC in the medium term (2009–15). Vietnam's Socio-Economic Development Plan (SEDP), 2011–2015 accords high priority to construction of urban infrastructure, taking into account environmental protection, in which special importance is attached to (amongst others) sewerage systems, waste and water treatment facilities, facilities for collection, transport, treatment and burial of waste.

Linked to this, the impacts of climate change are becoming particularly severe in the coastal cities. Sea level rise delays the discharge from the drainage system in estuarine areas, reverses river flows during high tide and reservoirs are intruded by salt water, and causes serious damages on urban infrastructure facilities. Flooding is impacted by high downstream water levels, preventing the rapid evacuation of flood waters. With the increasing sea levels and potential changes in storm intensity, this situation is likely to become both more uncertain and most likely exacerbated

It is within this context that the GOV together with the ADB has placed the Urban Environment & Climate Change Adaptation Project within the current lending program. The project is in conformity with the Country Partnership Strategy (CPS) agreed between the GOV and the ADB. It can also be seen to represent a pilot project for the development of urban municipal services in the coastal cities, thereby providing a timely model for development in accordance with the GOV strategies for climate change.

In terms of project rationale, the selection of the two project cities, Dong Hoi and Hoi An is justified by the fact that both are located in the Northern/Central Coastal Region which has historically been one of the most disaster-prone in Vietnam, threatened repeatedly by floods and typhoons. Climate change is likely to make these disasters more frequent and severe (by changing the severity of the typhoon and by raising sea levels), posing particular risks to the majority of people whose livelihoods depend upon tourism, agriculture and aquaculture. Selection is also justified in relation to their significant activities in relation to climate change adaptation planning and green growth initiatives, particularly Quang Binh/Dong Hoi.

1.2. PROJECT CATEGORIZATION

A screening exercise was presented in the Interim Report leading to the following conclusions:

- Project components in Dong Hoi will have minor impacts on biodiversity being partly implemented in urbanized areas. One component will even have positive impacts, promoting the protection of the costal dune and of its cover forest.
- Sewerage network and individual connections development inside Dong Hoi city will mainly generate impacts in relation to construction activities. Anticipated nuisances can be efficiently controlled and mitigated through detailed EMP for construction, detailed EHS specifications for construction contractors, strong contractual basis for environment and social issues and solid monitoring on site.

- Due diligence of the new WB Duc Ninh WWTP ESIA, a linked (associated) facility under construction, confirms it may accommodate additional sewage load related to the extension of connections in the city and the new network for Bao Ninh Ecotourism development.

Considering the anticipated limited impacts on the environment from all Project sub-components it was recommended to consider the classification of the Dong Hoi project as an ADB category B, requesting the preparation of an IEE.

However, this IEE will be complemented by a (i) full RP to address in details land acquisition and resettlement issues and (ii) by a full EMP focusing particularly on the construction period, recognizing that most of the implementation activities are located within or close to sensitive urbanized areas.

Considering the Vietnamese regulations, the study level will satisfy the standard requirements for an EIA.

1.3. PURPOSE OF EIA/IEE

This report gives an account of the initial environmental examination (IEE) of the proposed Urban Environment and Climate Change Adaptation Project for the city of Dong Hoi. The IEE was conducted as part of the subproject preparation to primarily: (i) identify and assess potential impacts and risks arising from the implementation of the proposed Subproject on and to the physical, biological, socio-economic and physical cultural environment; and (ii) recommend measures to avoid, mitigate, and compensate for adverse impacts, and enhance positive impacts. The present IEE was carried out following the Safeguard Policy Statement (June 2009) of the Asian Development Bank (ADB) and with reference to the Law on Environmental Protection (No. 52/2005/QH11) and its implementation guidelines, namely Decree No. 80/2006/ND-CP, Decree 21/2008/ND-CP and Decree No. 29/2011/ND-CP of the Government of Viet Nam (GOV).

1.4. REPORT ORGANIZATION

The Initial Environmental Evaluation follows a conventional layout for this type of report and integrates an Environmental and Social Management Plan (ESMP).In addition to this introduction, the reader will find the following Chapters in this report:

- The executive summary;
- The introduction with the project rational (Chapter 1)
- The applicable institutional and regulatory framework (Chapter 2);
- The description of the Project proposed components (Chapter 3);
- The baseline situation (Chapter 4);
- The impact analysis (Chapter 5);
- The alternative development options (Chapter 6);
- The public consultation activities (Chapter 7);
- The grievance and redress mechanism proposed (Chapter 8)
- The environmental and social management plan (Chapter 9)

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2. POLICY, INSTITUTIONAL & LEGAL FRAMEWORK

2.1. VIETNAM ENVIRONMENTAL REGULATIONS

The Vietnamese legal framework for environmental management continues to rapidly evolve. This section introduces the nation's relevant environmental policies. The key pieces of environmental legislation are followed by the environmental standards that apply to the Project.

- Law on the Protection of the Environment (LEP) was enacted in 2005. The LEP:
  - Identifies the responsibilities of the state center, provinces, organizations and individuals to prevent and remedy environmental deterioration and pollution and carry out specified environmental protection functions;
  - Provides for the development of environmental standards and submission of environmental impact assessment reports on new and existing facilities;
  - Provides for responsible parties to pay compensation for environmental damage;
  - Establishes the right of individuals and organizations to petition for enforcement of environmental regulations;
  - Calls for civil and criminal penalties for violations; and,
  - Encourages international environmental co-operation.
- Decree No. 80/2006/NS – CP promulgated on 09/08/2006 guides implementation of the LEP.
- Circular 08/2006/TT-BTNMT was promulgated in 2006 and provides guidance in setting up and appraising environmental impact assessment reports, strategic EIA and commitment to environmental protection.

To supplement the above key policies, there is a large range of decisions, regulations and standards that may also apply to the Project. These are:

- Decree 21/2008/ND-CP, February, 28, 2008, amending and supplementing a number of articles of the Government's Decree 80/ND-CP of August 9, 2006; detailing and guiding the implementation of a number of articles of the Law on Environmental Protection.
- Decree No. 29/2011/ND-CP, February, dated 18 April 2011 on strategic environmental assessment (SEA), environmental impact assessment (EIA) and environment protection commitment; The Decree 29 takes effect on June 5, 2011, and replaces Articles 6 thru 17 of the Government's Decree No. 80/2006/ND-CP of August 9, 2006, detailing and guiding a number of articles of the Environmental Protection Law; and Clauses 3 thru 10, Article 1 of the Government's Decree No.21/2008/ND-CP of February 28, 2008, amending and supplementing a number of articles of Decree No. 80/2006/ND-CP of August 9, 2006, detailing and guiding a number of articles of the Environmental Protection Law.(Article 40)
- Circular No. 26/2011/TT-BTNMT1 guiding in detail numbers of articles of Decree No. 29/2011/ND-CP, on strategic environmental assessment, environmental impact assessment and environmental protection commitment. The Circular No 26/2011/BTNMT replaced Circular No 05/2008/TT-BTNMT on September, 2, 2011.
- Decision No. 13/2006/QD-BTNMT, September 08, 2006, of the Ministry of Natural Resources and Environment, regarding stipulation of organization and operation of the assessment board for reports on Strategic Environmental Assessment (SEA) and EIA.
- Construction Law No 16/2003/QH11 issued November 26 2006. This Law shall apply to domestic organizations and individuals and to foreign organizations and individuals investing in construction of works and engaging in construction activities in the territory of the Vietnam.

- Law on Standards and Technical Regulations, No 68/2006/QH1, Issued June, 29, 2006. This Law provides for the formulation, announcement and application of standards; the formulation, promulgation and application of technical regulations; and the assessment of conformity with standards and technical regulations.
- Decree No.149/2004/ND-CP of July 27, 2004 on issuance of permits for water resources exploitation, exploitation and use, or for discharge of wastewater in to water source
- The Law on water resources No 17/2012/QH13, issued Jan 1, 2013
- Law No. 17/2012/QH13 dated June 21, 2012 of the National Assembly on Water Resources
- This Law to amending and supplementing a number of provisions on adjustment of policies to consider the water resources are the property of the state, the economic undertakings and use of saving water, efficiency and unified in management of the river basin management of combination with the local administration, the Law specifies the measures to prevent and combat pollution, degradation, depletion of water resources; the adaptation and troubleshoot the source of pollution water, protection and development of aquatic resources; corridors protect water resources and ensuring traffic flow. This Law takes effect from the date of January 01, 2013.
- Decree on Urban and Industrial –Park water drainage No: 88/2007/ND-CP, Issued May 28, 2007
- Decree No 67/2003/ND-CP of June 13, 2003 on Environmental Protection Charge for Waster Water
- Decision No: 48/2008/QD-TT, issued on 03/04/2008 by the Prime Minister, regarding Common General Guidelines on Feasibility Study Preparation for ODA Projects.
- MONRE's Circular No. 26/2011/TT-BTNMT dated 2nd September 2011 regarding guidance on strategic environmental assessment, environmental impact assessment and environmental protection commitment;
- MONRE's Decision No. 16/2008/QD-BTNMT dated 31st December 2008 regarding issuance of national technical regulations on environment;

The following are the environmental quality standards and regulations based on the Vietnam Standards promulgated in 1995 by the Ministry of Science, Technology and Environment (TCVN 5937, 5944, 5945).

- QCVN 01:2009/BYT: National Technical Regulation on drinking water quality
- QCVN 02:2009/BYT: National Technical Regulation on domestic water quality
- QCVN 03:2008/BTNTM: National Technical Regulation on the allowable limits of heavy metals in the soils
- QCVN 07:2009/BTNMT: National Technical Regulation on Hazardous Waste
- QCVN 05 : 2009/BTNMT : National technical regulation on ambient air quality
- QCVN 06:2009/BTNMT: National technical regulation on Hazardous substances in ambient air
- QCVN 07:2010/BXD: National technical regulation on Vietnam Building Code Urban Engineering Infrastructures
- QCVN 08:2008/BTNMT: National technical regulation on surface water quality.
- QCVN 09:2008/BTNMT: National technical regulation on ground water quality.
- QCVN 10:2008/BTNMT: National technical regulation on coastal water quality.
- QCVN 14:2008/BTNMT: National technical regulation on domestic wastewater
- QCVN 26:2010/BTNMT : National Technical Regulation on Noise

- QCVN 27:2010/BTNMT: National Technical Regulation on Vibration
- TCVN 6705-2000: Non-hazardous solid waste – Classification
- TCVN 6706-2000:Hazardous solid wastes – Classification
- TCVN 6774:2000: Freshwater quality guidelines for the protection of aquatic life.

2.2. VIETNAM ENVIRONMENTAL REQUIREMENTS AND FRAMEWORK

The Ministry of Natural Resources and Environment (MONRE) is the lead agency for environmental management in Viet Nam. At the provincial level, the MONRE operates through the Departments of Natural Resources and Environment (DONREs). In terms of administrative and technical matters, DONREs fall under the MONRE; in terms of operation, however, they are under the direct control of Provincial Governments through the Provincial People's Committees (PPCs).

Two types of environmental assessment reports are considered in Vietnam, an EIAR (Environmental Impact Assessment Report) or an EPC (Environmental Protection Commitment). In broad terms, an EIAR is required for project types listed in the Decree No. 29/2010/ND-CP and deemed to have potential for significant adverse impacts, as well as those located in protected areas or other environmentally sensitive areas. Project requiring EIAR is not necessarily equivalent to ADB category A project. A project requiring EIAR may be classified as environmental category A or category B according to the ADB's Safeguard Policy

In each Province the Department of Natural Resources and the Environment (DONRE) has established a Provincial Environment Administration (PEA). The PEA has an EIA Division specifically in charge of EIA related matters at provincial level and which also provides guidance to District and Commune level on these matters.

The EIAR is submitted to the Provincial Environment Administration (PEA) that provides certification on approval. The Provincial Project Management Units (PPMU) submits copies of the approved EIAR and certification to the Commune Peoples' Committees. The PPMU also prepares a summary of the report for public display in the relevant Commune People's Committee office.

The essential differences between preparation processes for an EPC and an EIAR are i) the level of field investigation, analysis and reporting required; and ii) the requirement for formalized consultation within the EIAR. By comparison, the scope and level of safeguard investigation required for an ADB IEE could be acceptable to prepare an EIAR.

Smaller projects without the potential for significant adverse impacts will be subject to a lower level of assessment in the form of EPC. EPCs are required to be submitted for appraisal at the time of Project Investment Report preparation. According to Circular No. 26/2011/TT-BTNMT which details the procedures for EPC, the authority which receives and certifies the EPC is the District People's Committee of the locality where the project is located. Decree No. 29/2011/ND-CP specifies procedures for projects implemented in two districts or more: the project owners can register the EPC in any of the district people's committee concerned, at their convenience.

The content and format of the EPC is detailed in an appendix to Circular No. 26/2011/TT-BTNMT. The EPC must include information on mitigation measures that will be taken. The EPC obliges the Provincial People's Committees (PPC) to ensure that the specified mitigation is carried out during project implementation.

The Government's environment approval process is described in detail in Decree 29/2011/ND-CP (notably articles 13, 18, 19 and 20). An overview of the different government approval mechanisms with respect to the most recent project implementation schedule is summarized in the following table.

According Article 18 of Decree 29/2011/ND-CP, this particular project requires a detailed EIA which will be appraised and approved by the PPC[1].

Table [1] THE GOV EIA REPORT PREPARATION, APPRAISAL, APPROVAL & IMPLEMENTATION PROCESS

STEPS IN THE PROCESS	RESPONSIBLE ENTITY	TIMELINE WITH RESPECT TO CURRENT PROJECT IMPLEMENTATION SCHEDULE
Preparation & submission of EIA Report	QB WSDC	2013-Early 2014
Appraisal of EIA Report: 30 working days, or 45 working days for projects with complicated environmental impacts.	QB PPC (through an Appraisal Council)	February-March 2014
Approval of EIA report: 15 working days once EIAR has incorporated comments/recommendations of appraisal results):	QB PPC	May 2014
Disclosure of contents of approved EIA report concerned Ward/Commune People's Committee/s	QB WSDC	Summer 2014
Implementation of approved EIA report, compliance with requirements or conditions stated in the decision on the approval of the EIA report, reporting of implementation and compliance, meeting environmental standards	QB WSDC	Following Loan Effectiveness
Directing/organizing the monitoring of the implementation of approved EIAR.	QB PPC	

2.3. ADB ENVIRONMENTAL SAFEGUARDS POLICY

In 2005, the Asian Development Bank (ADB) embarked on a review process of its three safeguard policies on the environment, involuntary resettlement and Indigenous Peoples. The 2009 Safeguard Policy Statement is the result of this four-year process. NGO Forum on ADB's network members was heavily involved in monitoring and commenting the review process.

In July 2009, the ADB approved its new Safeguard Policy Statement (SPS), which became effective in January 2010. The new Safeguard Policy Statement replaces the ADB's previous separate policies on each of these areas: Policy on Indigenous People (1998), Involuntary Resettlement Policy (1995) and Environment Policy (2002). Key documents related to the new Policy include:

- ADB, 2009. Safeguard Policy Statement, Manila.
- ADB, 2012. Environment Safeguards, a Good Practice Sourcebook, Draft Working Document, Manila.

The standards contained in the ADB's Safeguard Policy Statement have far-reaching impacts. They determine the ADB's environmental and social obligations for its annual and rising lending volume and influence emerging national legal frameworks in Asia. Due to the Bank's increasing support for private sector operations, the Safeguard Policy Statement also determines how private financing, supported by the ADB, operates in Asia.

The overarching statement on ADB's Commitment and Policy Principles (Chapter V) says that the ADB's safeguards have the following objectives (SPS, p 15): i) avoid adverse impacts of projects on the environment and affected people, where possible; ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and iii) help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

[1] It should be noted that the site of this project is not located near to the Phong Nha Ke Bang National Park (a Unesco World Natural Site) which is located some 50 km to the north west of Dong Hoi City itself.

2.3.1. GENERAL REQUIREMENTS

The Policy Delivery section (Chapter V B, paras. 53–64) lists general requirements that the ADB is obliged to follow in regard to: project screening and classification, information disclosure, consultation and participation, due diligence, monitoring and reporting, local grievance redress mechanisms and the Bank's Accountability Mechanism.

- **Project screening and classification**: The Policy stipulates that the ADB will undertake project screening as early as possible to i) determine the significance of adverse impacts; ii) identify the level of assessment and institutional resources required; iii) determine disclosure requirements (para. 50).
- **Information disclosure**: In line with the ADB's Public Communications Policy, the Policy requires (para. 53) that for environment Category A projects, draft environmental impact assessments must be posted on the ADB's website 120 days before project approval. For draft environmental assessment and review frameworks, draft resettlement frameworks and/or plans and draft Indigenous Peoples planning frameworks and/or plans, the Policy only stipulates that these documents must be provided by the borrower/ client and posted on ADB's website before project appraisal, as follows: i) final or updated environmental impact assessments and/or initial environmental examinations, resettlement plans, and Indigenous Peoples plans upon receipt (by the ADB), and ii) environment, involuntary resettlement and Indigenous Peoples monitoring reports submitted by borrowers/clients during project implementation upon receipt (by the ADB).
- **Consultation and participation**: The general provisions on consultation and participation are mostly phrased as aspirations. The Policy states that the ADB "is committed to working with borrowers/ clients to put processes of meaningful consultation and participation in place." Meaningful participation is defined as: i) beginning early in the project preparation stage and being carried out on an ongoing basis throughout the project cycle; ii) providing timely disclosure of relevant and adequate information that is accessible to affected people; iii) being free of intimidation and coercion; iv) being gender inclusive and responsive; and v) enabling the incorporation of all relevant views of affected people and other stakeholders in decision-making (para. 54).
- **Due diligence and review of safeguard assessments and plans**: Due diligence refers to the ADB's process of assessing safeguard issues through field visits and desk reviews as well as through examining relevant safeguard documents (such as environmental impact assessments, resettlement plans, Indigenous Peoples' plans). Through its due diligence processes, the ADB confirms that all potential environmental and social risks are identified. If they cannot be avoided, it ensures that appropriate mitigation measures are identified (SPS, para. 56).
- **Monitoring and reporting**: The monitoring obligations are merely required to be "commensurate with the project's risks and impacts". For highly complex and sensitive projects, the ADB requires the borrower/client to engage an independent advisory panel" (SPS, para. 57).
- **Local grievance redress mechanisms**: The Policy requires the borrower/client to set up and maintain a grievance redress mechanism at project level (SPS, para. 59). This mechanism does not replace the ADB's accountability mechanism, but is intended to solve grievances at the local level. Affected people can also take complaints to the ADB's Accountability Mechanism. The Accountability Mechanism Policy merely requires complainants to demonstrate that they have sought to address their complaint with management.

2.3.2. ENVIRONMENTAL REQUIREMENTS

More precisely as environment aspects are concerned, the objective of the Policy is to "ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process" (SPS, p. 17). The main Environmental Safeguard requirements are the followings:

- **Categorization and information disclosure**: The Policy uses a categorization system to reflect the significance of a project's potential environmental impacts. "A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence" (SPS, para. 50). The following categories exist:
  - **Category A**: significant adverse environmental impacts that are irreversible, diverse or unprecedented. Category A projects requires a full-scale Environmental Impact Assessment (EIA). A draft EIA, including the Environmental Management Plan, must be made available on the ADB's website at least 120 days prior to Board approval.
  - **Category B**: less adverse environmental impacts that are site specific, few of which are irreversible, and mitigation measures that can be designed more readily than for Category A projects. Category B projects require an Initial Environmental Evaluation.
  - **Category C**: minimal or no adverse environmental impacts. Category C projects require further environmental assessment actions/documents.
  - **Category FI**: projects involving ADB funds to, or through, a financial intermediary. Category FI projects require an Environmental and Social Management System.

  Final or updated EIAs and/or initial environmental examinations must be made available upon receipt on the ADB's website.
- **Assessment process**: Environmental impacts must be determined in consultation with affected people and concerned non-government organizations (NGOs). For category A projects, the borrower/client is required to undertake an assessment of options that looks at alternatives to the project's location, design, technology and components. The options assessment will also examine the "no project" alternative. The borrower/client must present the rationale for selecting the particular project details, including a cost-benefit analysis that takes into account environmental costs and benefits of the various alternatives considered (SPS, Appendix 1, para. 4).
- **Type of impacts**: The types of impacts related to the environment include physical, biological and socioeconomic impacts. These can relate to occupational health and safety; community health and safety; vulnerable groups; gender issues; and impacts on livelihoods and physical cultural resources (SPS, Appendix 1, para. 5). For Occupational and Community Health and Safety aspects, the Policy
- **Project site/scope**: The project site covered by the environmental safeguard provisions in the Policy is defined as: "the primary project site(s) and related facilities that the borrower/client (including its contractors) develops or controls, such as power transmission corridors, pipelines, canals, tunnels, access roads, borrow pits and disposal areas, and construction camps". This definition also includes: associated facilities that are not funded as part of the project, but "whose viability and existence depends exclusively on the project"; "areas and communities potentially affected by cumulative impacts from further planned development of the project"; and predictable impacts caused by the project "that may occur later or at a different location" (SPS, Appendix 1, para. 6).
- **Transboundary impacts**: The environmental assessment process must identify potential transboundary effects, such as air pollution and increased use or contamination of international waterways. It must also identify global impacts, such as the impact of greenhouse gases and impacts on endangered species and habitats (SPS, Appendix 1, para. 7).
- **Environmental planning and management**: If environmental impacts are identified, the borrower/ client is required to prepare an environmental management plan describing how potential impacts and risks will be addressed (SPS, Appendix 1, para. 12).
- **Consultation and participation, grievance mechanism**: The consultation process and grievance mechanism process follows the same provisions as laid out in the general requirements (see above) (SPS, Appendix 1, paras. 19 and 20).

- **Reporting and monitoring**: The Policy states that "the extent of monitoring activities will be commensurate with the project's risks and impacts" (SPS, Appendix 1, para. 21). For Category A projects, the borrower/client is required to retain qualified external experts or qualified NGOs to verify its monitoring information. The minimum requirements are semi-annual reports during construction for Category B projects, and quarterly monitoring reports during construction for Category A reports. For projects with likely ongoing impacts during operation, annual monitoring is required. Monitoring reports must be posted in a location accessible to the public (SPS, Appendix 1, paras. 21 & 22).
- **Unanticipated environmental impacts**: If unanticipated impacts occur during project implementation, the borrower/client is required to update the environmental assessment and environmental management plan or prepare a new assessment and plan (SPS, Appendix 1, para. 23).
- **Biodiversity conservation and sustainable natural resource management**: This section (SPS, Appendix 1, paras. 24 – 49) contains requirements regarding the following issues: modified habitats; natural habitats; critical habitats; legally protected areas; invasive alien species; management and use of renewable resources; pollution prevention and abatement (resource conservation, energy efficiency, waste, hazardous materials, pesticide use and management, greenhouse gas emissions); health and safety (occupational health and safety and community health and safety); and physical cultural resources (SPS, Appendix 1, para. 24).

2.3.3. STRENGTHENING AND USE OF COUNTRY SAFEGUARD SYSTEM

The Policy states that the ADB is committed to strengthening and using country safeguard systems (CSS). This means that the borrowing country's legal and institutional framework would be applied in regard to the social and environmental impacts of a project instead of the ADB's safeguard policy requirements.

The approach taken by the ADB to using country safeguard systems has two key components:

- First, in order to apply the country system, the ADB must conduct an "equivalency assessment" which evaluates the country's provisions against ADB safeguard requirements. Only if the country's provisions are found to be equivalent to that of the ADB can the country system be applied.
- Second, the borrowing country must be found to have the implementation practice, track record, and the capacity and commitment to implement the applicable regulations. This provision is referred to as the "acceptability assessment".

The Policy states that "to the extent possible, the proposal for the strengthening and use of the CSS, together with its justification, is presented in the country partnership strategy or in country partnership strategy progress reports" (SPS, Appendix 6, para. 14). In addition, the Policy commits the ADB to hold in-country consultations with stakeholders, including governments and NGOs, on the equivalency and acceptability assessments. The final equivalency and acceptability assessments must be disclosed on the ADB's website upon completion (Appendix 6, para. 14).

oOo

3. PROJECT DESCRIPTION

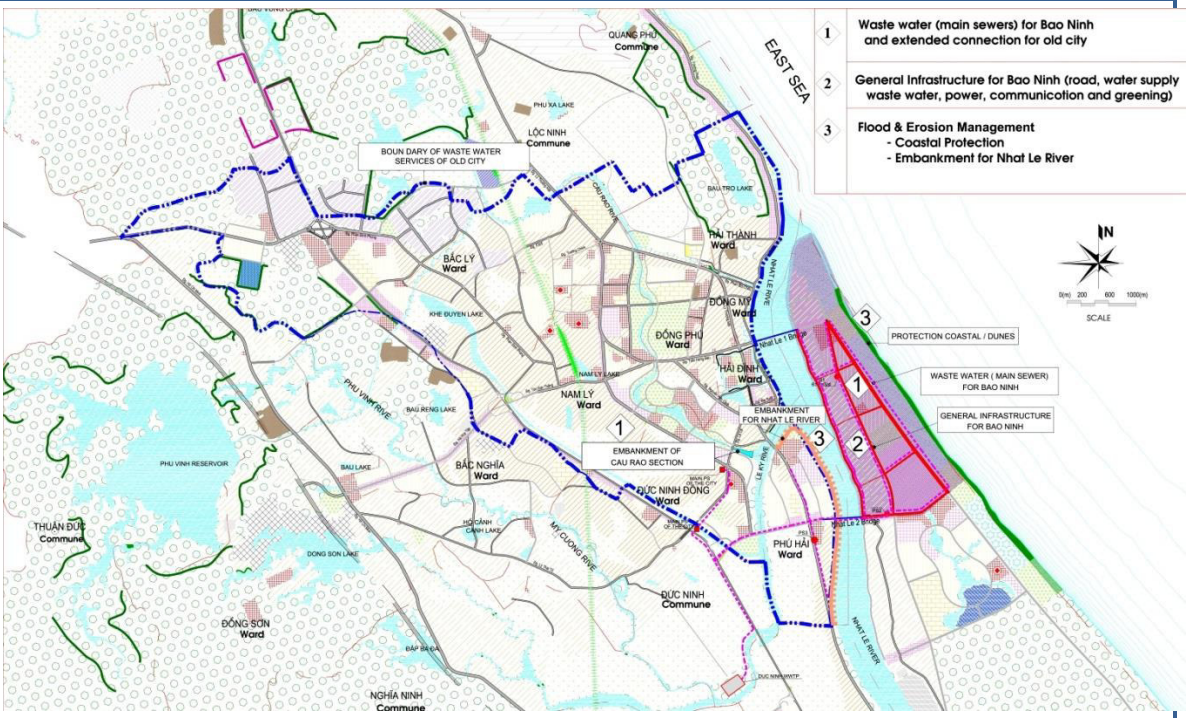
3.1. PROJECT LOCATION: DONG HOI CITY

Dong Hoi City is a Class III City with a population of 113,900 (census 2010) targeting Class II City status (population over 200,000) in 2015 or shortly thereafter. It is the administrative capital of Quang Binh Province and is a major economic and tourism center in the northern central region of Vietnam. The city is located close to major future transportation and other major infrastructure developments which include the East/West road corridor linking Vietnam, Laos and Thailand; the proposed Indochina railway linking China and Thailand via Vietnam; the new sea ports at Song Gianh and Hon La to the north; the new 2,400 MW thermal power station in Quang Binh; opening of PetroVietnam office in Dong Hoi and the possibility of oil exploration; potential development of large limestone reserves for construction, and proximity to the large economic zone 100km north in Ha Tinh province.

Dong Hoi City is also an important tourism center with many kilometers of beaches, significant cultural heritage and most importantly the National Garden of Phong Nha - Ke Bang Caves, listed by UNESCO as World Natural Heritage in 2003, at only 50 km.

During the American war, Dong Hoi City was heavily bombed and almost all the infrastructures destroyed. After the war, reconstruction work was slow, mostly due to financial constraints. As a consequence, the infrastructure of Quang Binh in general and Dong Hoi City in particular has not been developed comprehensively. Furthermore, Dong Hoi City is affected by severe weather conditions such as typhoons, floods and droughts, high tides and coastal erosion and is vulnerable to climate change.

Figure [1] LOCATION OF DONG HOI PROJECT COMPONENTS



Source : PM Group, 2013

3.2. PROJECT PLANNING

The project and the different components have been included in the overall masterplan[2] for the city of Dong Hoi and its associated sector plans. During the PPTA assignment a specific planning document[3] for the Bao Ninh components was also developed and approved by Quang Binh PPC. The stipulations of this document and the PPTA detailed FSRs should be followed during the detailed design and the implementation of these components.

The following overall zoning for Bao Ninh is proposed as part of the development of a socially inclusive development plan for Bao Ninh incorporating climate proofing. The principles as agreed with Quang Binh authorities consist of

a) Minimising social impacts on the existing fishing village and providing incentives for existing inhabitants to connect to water/wastewater networks via a targeted grant facility

b) Imposing regulatory control on developers through the EA mechanism, particularly in relation to storm water runoff

c) Developing a coastal zoning scheme to protect primarily the dunes to the south of the proposed development zone

d) Rehabilitation of the degraded dunes in the development zone area

e) Providing appropriately sized urban infrastructure in the development zone (water, separate stormwater and wastewater systems, transport, …)

f) Developing a pilot system for a Sustainable Urban Drainage System on the Bao Ninh Peninsula.

An overview of the proposal is provided in the following figure.

Figure [2] ZONING AND CLIMATE PROOFING OF BAO NINH PENINSULA DEVELOPMENT.

[2] General adjustment planning of Dong Hoi City and neighbouring areas till 2025, vision 2035. Nikken Sekkei Civil Engineering Ltd. (NSC). July 2012

[3] Decision Approving the Revised Zoning Planning of Northern of BaoNinh, Dong Hoi City – Scale: 1/2000, Quang Binh PPC Quang Binh, November18, 2013, No. 2849/QĐ-UBND

3.3. THE PROPOSED PROJECT

The Urban Environment and Climate Change Adaptation Project, covering improved urban environment and climate change adaptation for Dong Hoi City, consists of two sub-outputs:

- Climate proofed urban development (Bao Ninh Component)
- Improved wastewater management in Dong Hoi.

The activities related to these components are described below.

3.3.1. CLIMATE PROOFED URBAN DEVELOPMENT (BAO NINH URBAN DEVELOPMENT)

The purpose of this component is to serve as a model for climate change adaptation for new urban developments in coastal cities in Vietnam. There have been in the past a number of initial errors in development which will require remediation especially in relation to the coastal dune areas. These remedial aspects have been integrated into the storm drainage and the dune protection sub components as described below.

The activities under this component have been summarized as below:

1) ***Bao Ninh Wastewater System***: Covering the communes of Bao Ninh and Phu Hai, serving a total population of 12,670 (including 1,000 tourists) by 2020 and including 13.1 km of gravity sewer, 3.5 km of pumping main and 3 pumping stations.
2) ***Bao Ninh Road Systems***: Serving the new urban area of Bao Ninh and including 2 North-South roads of 5.7km length and 3 East-West roads of 2.2 km length.
3) ***Bao Ninh Sustainable Urban Drainage System***: covering on site stormwater retention, stormwater infiltration through roadside 11.6 km swales, remediation of the 60m road drainage, detention storage (1.6 ha) and connecting sewerage and final outfalls (7.0 km) to the Nhat Le River.
4) ***Bao Ninh Flood and Coastal Protection***: including restoration and protection of 5 km of coastal dunes as a model for the protection of coastal dune along the coastline.

3.3.1.1. BAO NINH WASTEWATER SYSTEM

The City Sanitation Strategy (CSS) Report undertook a detailed options analysis for the Bao Ninh Peninsula wastewater system. Three options were considered, including (i) a centralized WWTP located on the peninsula, (ii) pumping wastewater to the nearby Duc Ninh WWTP, and (iii) a combined centralized/decentralized wastewater treatment option.

Economic analysis was undertaken with the results provided as below. As can be appreciated the pumping option is clearly the least cost option (although this does assume that there will be treatment capacity available in the Duc Ninh WWTP).

Table [2] ECONOMIC COMPARISON OF OPTIONS FOR THE BAO NINH AREA WASTEWATER SCHEME

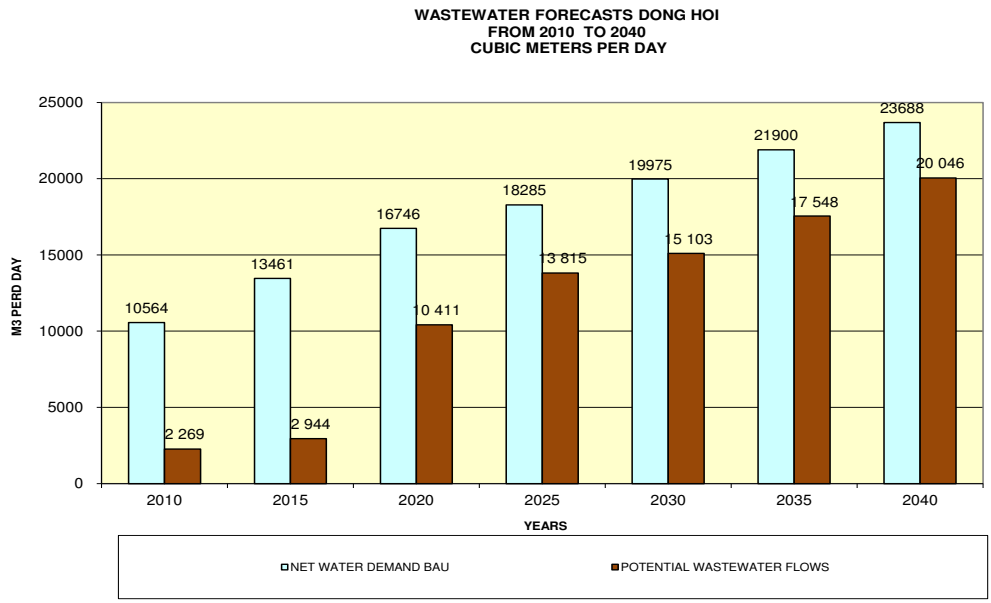
OPTION	PV CAPITAL COST $M	PV O&M COST $M	PV 8% DR, 30 YRS, $M
Option 1 centralized 5,000 m^3/d WWTP	5.65	1.25	6.91
Option 2 combination centralized/ decentralized 5,000 m^3/d WWTP	4.95	1.03	5.98
Option 3-Pump Bao Ninh wastewater to Duc Ninh WWTP	3.64	1.59	5.23
Option 3A-as Option 3 but with 5% pa power increase	3.64	1.89	5.53

Figure [3] OPTIONS CONSIDERED FOR BAO NINH AREA WASTEWATER FROM CSS REPORT (2010)

The use of the decentralised approach for the peripheral areas of Dong Hoi would appear justified especially as the peripheral areas becoming progressively linked to the main water supply system. However, its use in Bao Ninh would not fit well with the proposed tourist function and more conventional solution involving a centralised plant on Bao Ninh or pumping to Duc Ninh is advocated. The use of decentralised approaches (such as septic tanks) for the tourist facilities in Bao Ninh would also not be advisable due to the requirement to discharge to the beach with the possible impact on the integrity of the nearby dunes and possible impacts on bathing water quality.

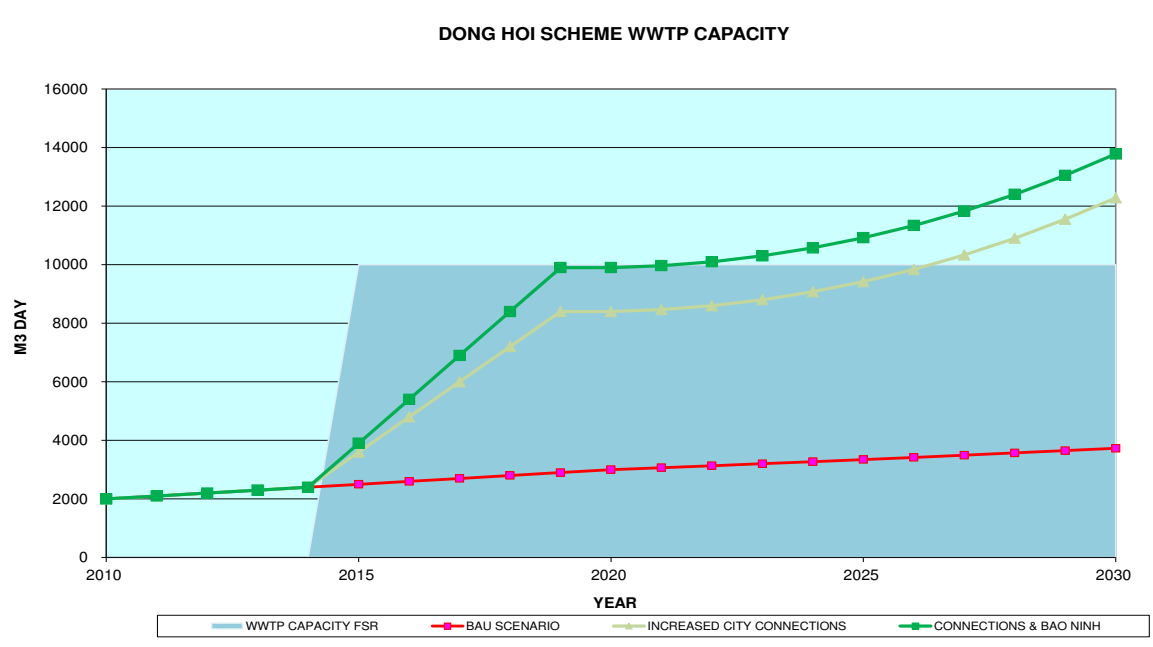
To check the above requirements wastewater flow projections and loading rate projections have been undertaken using the previous water demand requirements as a basis. Total volume of generated and collected wastewater in the project area is shown in the following figure confirming that approximately 10,000 m3/day will be passed forward for treatment to the Duc Ninh Plant. In the longer term these flows will naturally increase exceeding the quoted design capacity. Further discussion of the impact on the Duc Ninh plant of possible increased flows is provides below.

Figure [4] PROJECTIONS OF WASTEWATER FLOWS TO 2040



Source : PM Group, 2013

Figure [5] ESTIMATE OF FLOWS TO TREATMENT WITH AND WITHOUT THE PROJECT



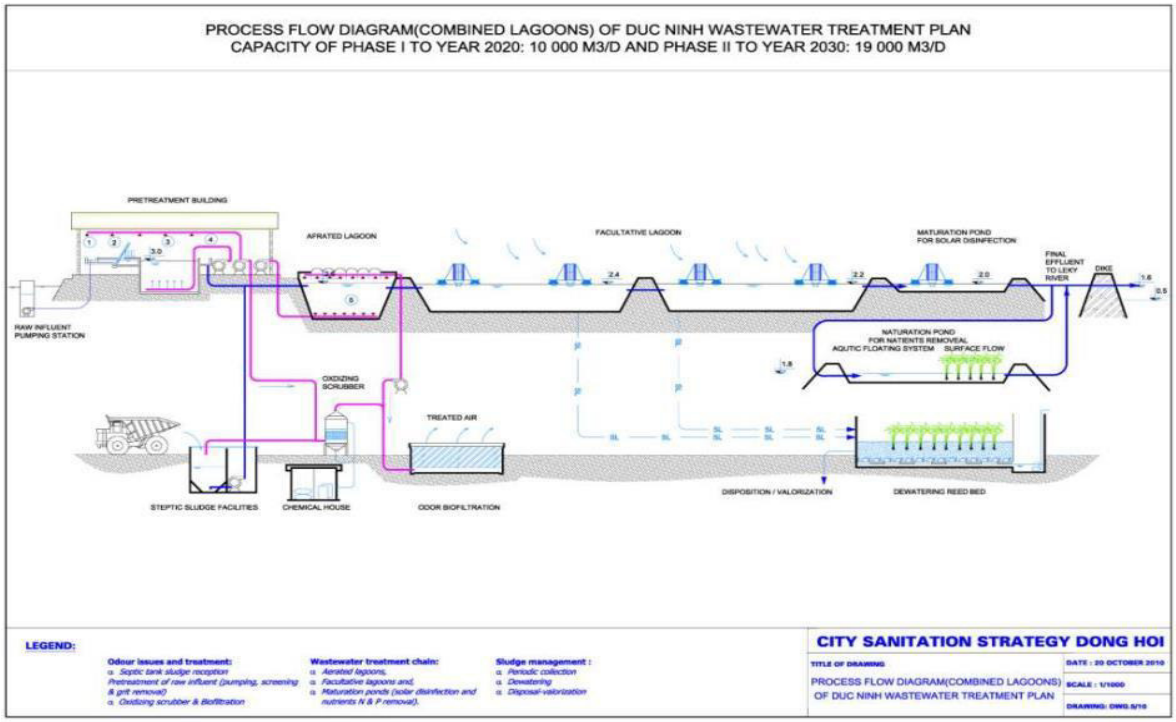
Source : PM Group, 2013

As illustrated below the Duc Ninh plant consists of a number of treatment lines, namely

- 2 parallel Aeration lagoons
- 4 facultative lagoons (2 series of 2 parallel lagoons)
- Finishing ponds consisting of a maturation pond and a wetland

At this stage there is no information concerning measured concentrations of wastewater arriving at the treatment plant, but it can be assumed that BOD rates will be no higher than 200 mg/l and probably significantly lower than this.

Figure [6] PROCESS FLOW DIAGRAM FOR THE DUC NINH PLANT (FROM CSS REPORT 2010)



Source : PM Group, 2013

Analysis of the performance of the plant undertaken by the PPTA Consultant and provided in the detailed FSR shows that at design flows and probable loading rates the performance of the plant would be extremely good, able to achieve the existing discharge criteria (QCVN 14 2008 Level B). However at higher design flows residence times in the facultative ponds will reduce significantly below 3 days thereby reducing significantly the treatment efficiency of the facultative ponds. There is also a risk that stricter discharge criteria (say a 20 or 30 mg/l BOD criteria, the latter being applied as part of QCVN 14 2008 Level A) is applied in the future.

In this context at the higher flows after 2020, the two downstream facultative ponds could be connected in parallel with the upstream ponds thereby reducing the flow through each pond and maintaining at least the normal 3 day residence time in each pond. In fact in the case of 4 parallel ponds residence time in the ponds would be approximately 4.5 days for a flow of 15,000 m3/day which would be sufficient to ensure treatment of flows up to 2030 assuming current effluent standards apply.

It is expected that the Bao Ninh Commune wastewater flows for Phase 1 resort developments can therefore be accommodated within the WWTP, since the design flows shall likely not be achieved until 2020. Wastewater projections and concept design is based upon Vietnamese norms of 80 persons per hectare, typical for areas such as Bao Ninh. Therefore, ultimate projected wastewater flow for Phase I area is projected to be 1,990 m3/day.

The project intends to pump the Bao Ninh wastewater across the Nhat Le 2 Bridge to an intermediate pumping station in Phu Hai Ward, then onwards to Pump Station 13 constructed under the CCESP, where wastewater flow can then be pumped directly to the Duc Ninh WWTP. The project includes:

In Bao Ninh

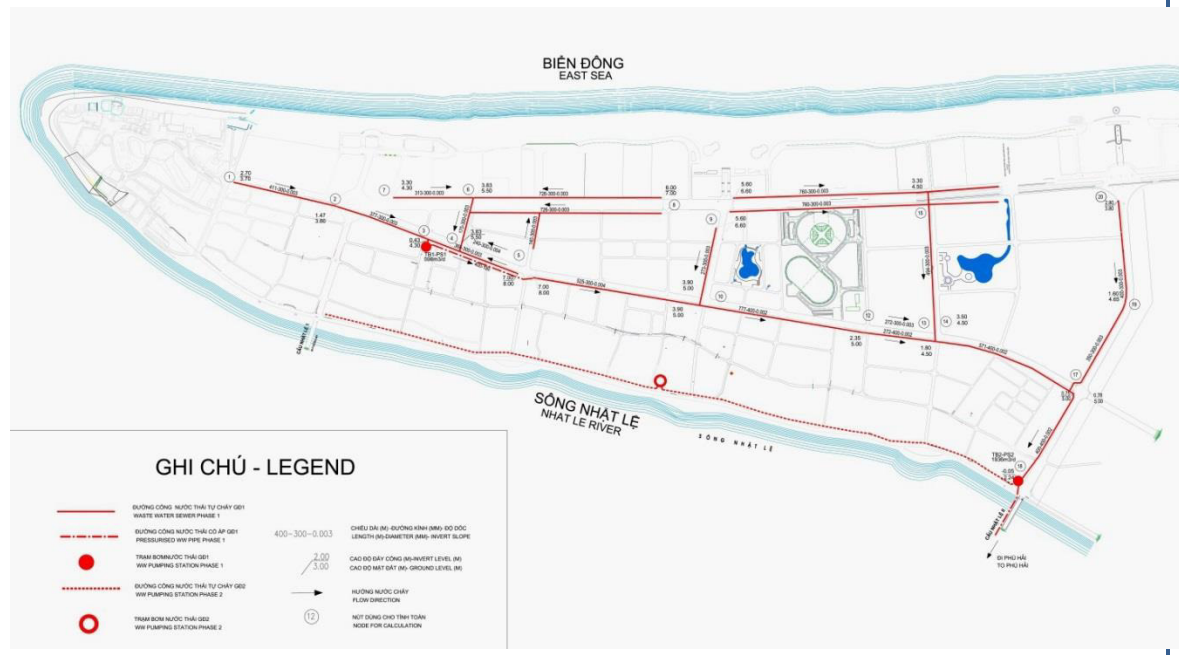
- Gravity pipes: 8.4 km (diameter 300 mm) and 2.0 km (diameter 400 mm)
- Pumping mains: 1.3 km (diameter 200 mm) and 0.4 km (diameter 150 mm)
- 2 pumping stations (598 and 1,960 m3/d)

In Phu Hai

- Gravity pipes: 1.9 km (diameter 300 mm) and 0.7 km (diameter 400 mm)
- Pumping mains: 1.8 km (diameter 250 mm)
- 1 pumping stations (2,833 m3/d)

The design of the proposed wastewater collection and pumping system for Bao Ninh itself is shown in following Figure [7] .

Figure [7] BAO NINH WASTEWATER SYSTEM



Source : PM Group, 2013

3.3.1.2. BAO NINH ROAD IMPROVEMENT

The roads proposed for financing in Phase 1 are summarized in red in the following Figure [8] . Of note with respect to previous proposals is the suppression of all proposed roads extensions/widening through the existing fishing village and the completion of the 60 m road from the ADB financing. In addition the remaining roads have been reduced significantly in width while maintaining a significant side width for greening/drainage which could be made available for extensions should widening become necessary at a future date.

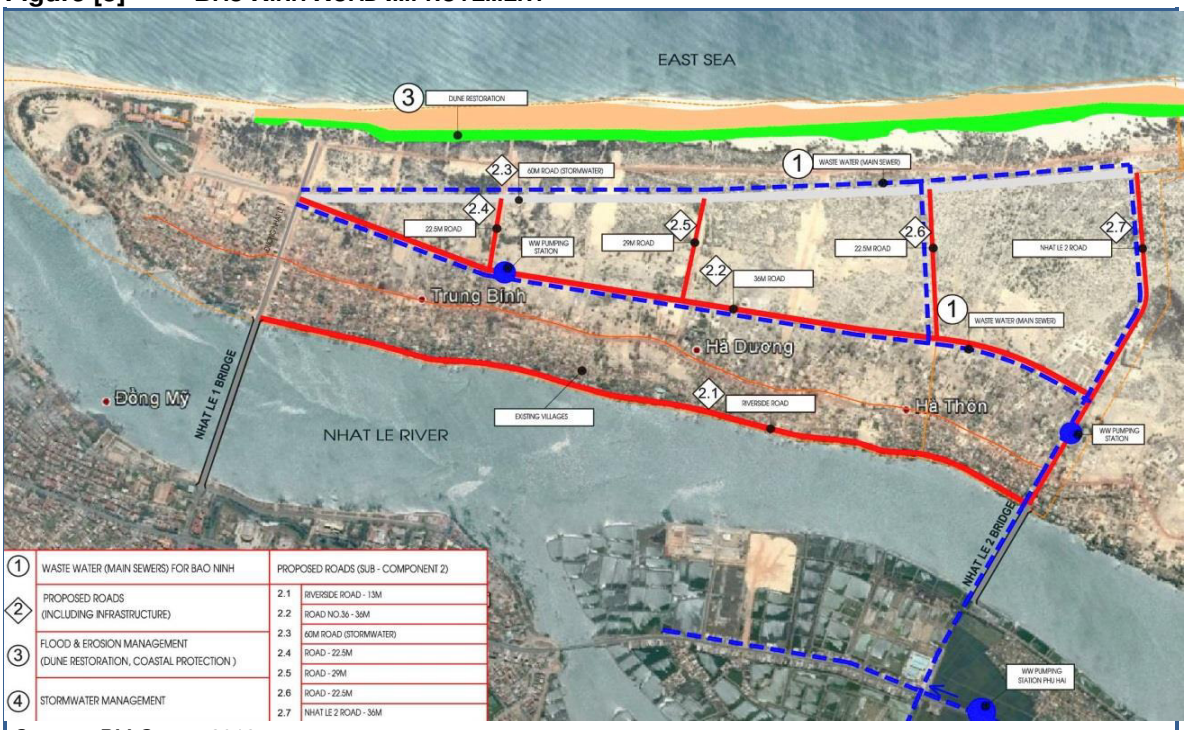
The following roads are concerned by Phase 1:

- N-S road number 2.2 with width 36 meters, length 3.6 Km, including: road bed, road surface, plant trees, water drainage system, lighting, electricity line, communication line.
- E-W road number 2.4 (width 22.5 meters, length 330 meters), include: road bed, surface water drainage, lighting
- E-W road number 2.5 (width 22.5 meters, length 450m), include: Road bed, road surface, water drainage and lighting.

- E-W road number 2.6 (width 36 meters, length 1,4 km), include: road bed, road surface, water drainage, lighting

These roads are depicted in red on the following figure.

Figure [8] BAO NINH ROAD IMPROVEMENT



Source : PM Group, 2013

3.3.1.3. BAO NINH STORMWATER SYSTEM

Overall impermeability of the Bao Ninh development zone is set to rise to up to 70%. To drain such a large area by conventional storm sewerage systems will lead to excessive costs and potential impacts on the environment. As has already been witnessed, the integrity of the existing dune system has been broken by the construction of five existing outlets.

The system proposed by the PPTA specialists therefore consists of remediation of the previously constructed drainage associated with the 60 m road together with the development of a storm sewerage system based upon reduction of storm flows from developer sites, road side infiltration, detention storage/infiltration methods and final outflow to the Nhat Le River. An overview of the proposed system is provided in the following figure.

The system is based on the Sustainable Urban Drainage System (SUDS) already used in many countries and particularly adapted to tropical countries facing monsoon regimes as it contributes solving 3 major problems which are flash floods, water scarcity and water pollution. The system has been widely used in Malaysia where SUDS is referenced as a Best Management practice in the Urban Stormwater Management Manual since 2001. The system has been adapted to various local conditions including along beaches and coastal dunes in Northern-Carolina (USA). This system applies particularly well to the conditions observed in Bao Ninh.

Many towns have existing infrastructure that allows the stormwater to flow into sounds or the ocean through stormwater discharge pipes. These pipes are often scattered across the coastal landscape. This is what was initially intended in Bao Ninh, 5 of these pipes being already implemented after significant degradation of the coastal dune for their implementation.

It has been well documented that stormwater carries pollutants that can be detrimental to the aquatic environment and human health. This places environmental pressure on the coastal water

resources, and increases health concerns to peoples who use these waters for recreational purposes, particularly in tourist areas. Sand filters have been shown to be an effective means to capture bacteria in stormwater, and diversion of stormwater from existing pipes into the dunes was the principle that guided the development of the dune infiltration system proposed for Bao Ninh.

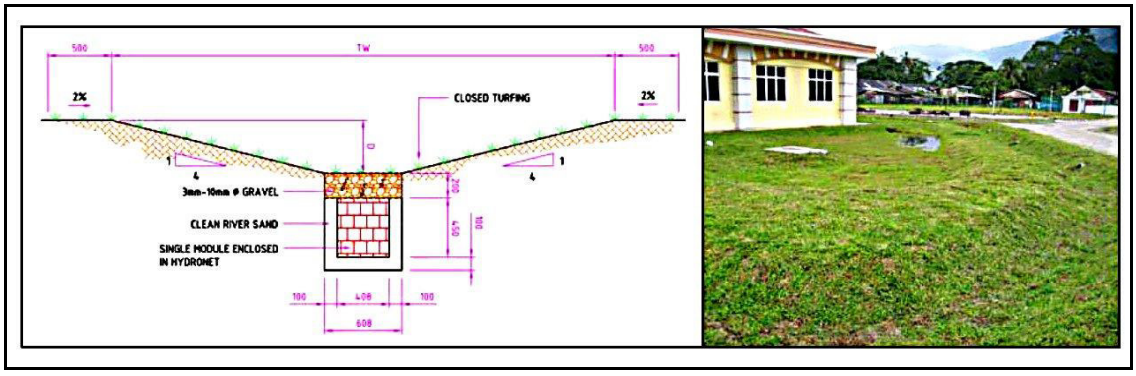
Before the coastal area is developed, rainfall easily infiltrates into the sandy soils and portions recharge shallow groundwater. The system is designed to recapture this natural process by collecting stormwater runoff and providing an opportunity for infiltration into the sand. To accomplish this, flow from the existing development areas is diverted either in open swales or into open-bottomed chambers located beneath the sand dunes. Once it enters the chambers, the stormwater infiltrates into the sand and spreads out laterally beneath the dunes.

As it would be impractical to design a system large enough to capture all runoff produced from every storm, particularly in monsoon areas, during extremely intense rainfall events, stormwater exceeding the system capacity will be allowed to bypass the system and flow through a conventional stormwater pipe to the discharge point in the Nhat Le river. An immediate benefit will be the smaller capacity required for the conventional network, thus a lower investment cost.

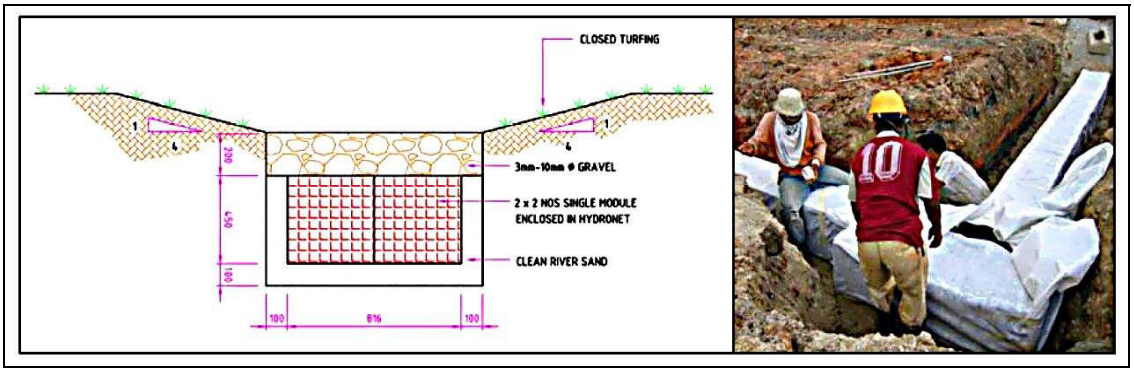
Following illustrations describe the proposed system

GRASSED SWALE WITH RIVER GRAVELS MARKING THE LOW FLOW CHANNEL

DRY STORAGE POND

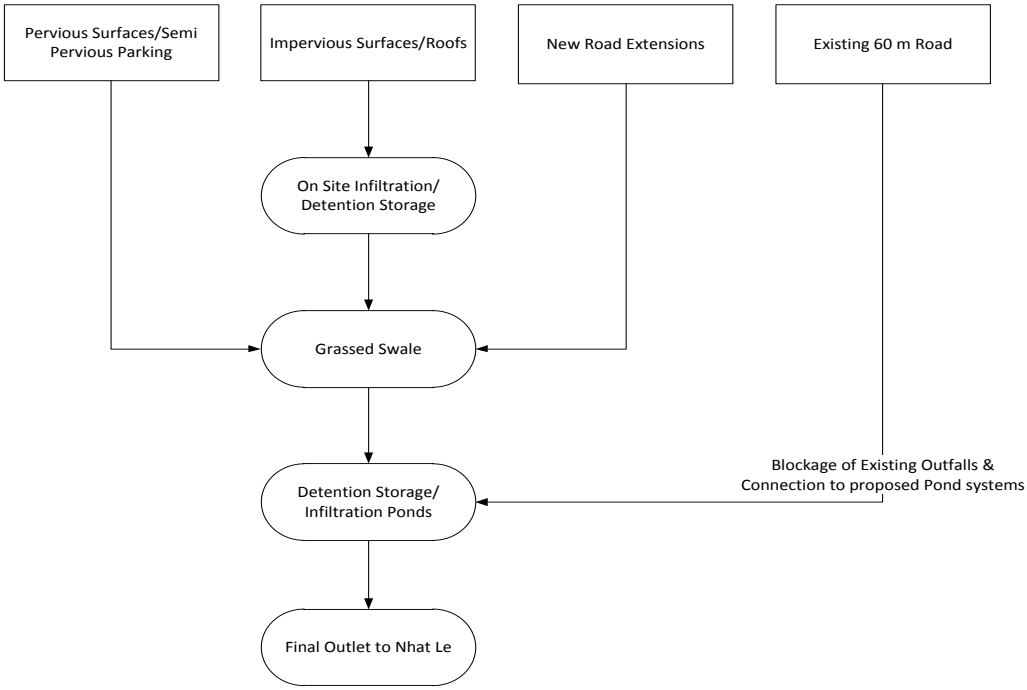


GRASSED SWALE



UNDERGROUND DETENTION STORAGE

Figure [9] PRINCIPLE FOR PROPOSED STORM DRAINAGE OF BAO NINH

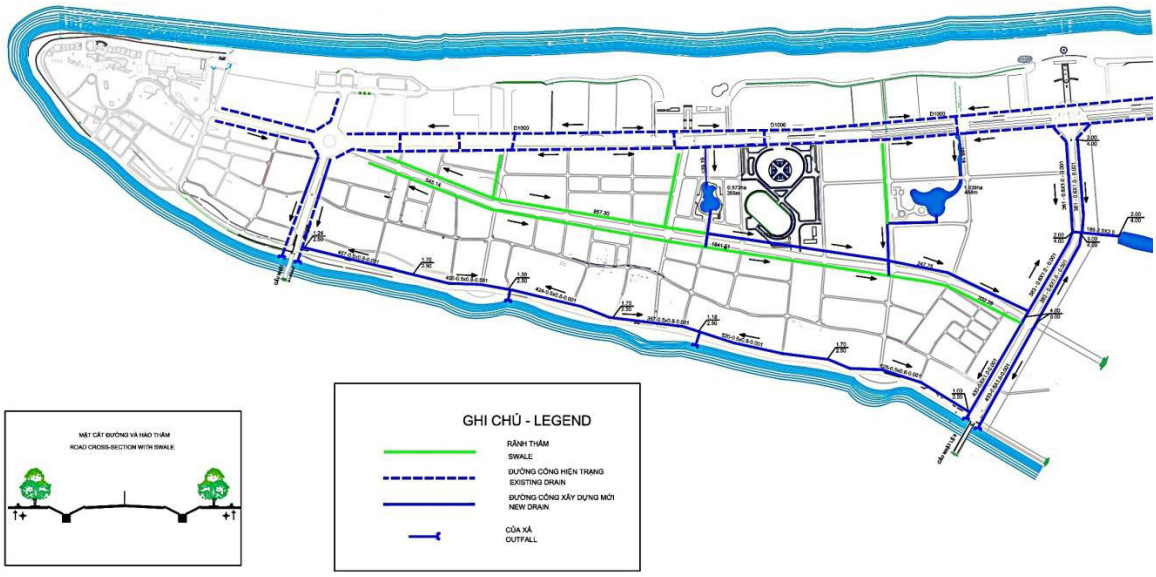


Source : PM Group, 2013

For the new plots, developers will not be generally authorized to directly connect impermeable surfaces drainage (internal roads, roofs, etc). Peak discharges should be restricted to natural background values by the use of on-site infiltration and/or detention storage. Enforcement measures for compliance with the proposed system will be included in the EMP.

The proposed system is illustrated in the Figure [10] below.

Figure [10] BAO NINH PROPOSED STORMWATER DRAINAGE



Source : PM Group, 2013

3.3.1.4. BAO NINH INTEGRATED FLOOD AND COASTAL PROTECTION

This component includes two sub-components: (i) a program for the physical restoration of the coastal dune conservation and for safeguarding the integrity of the dune system in the future, and (ii) the hydrodynamic study of the mouth of the Nath Le river in order to improve understanding of the natural system of dunes, beaches, foreshore, under-water delta, and the forces acting upon it (wind, waves, tides, currents).

3.3.2. IMPROVED WASTEWATER MANAGEMENT (DONG HOI WASTEWATER)

3.3.2.1. ON GOING WASTEWATER ACTIVITIES

The construction works implemented by the on-going World Bank (WB) funded Coastal Cities Environmental Sanitation Project (CCESP) was a mixed drainage and wastewater system that has substantially improved the environmental conditions and reduced flooding within Dong Hoi City, including:

- Phase 1 has been completed including combined drainage works in the city center areas of Dong My, Hai Dinh, Nam Ly and Dong Phu Wards. Dredging and embankments have been constructed along the Cau Rao River, Phong Thuy channel and Nam Ly Lake. Total length of drains in Phase I was about 22km with concrete pipe diameters from 300 - 1000 mm. Upon completion of Phase I, flooding has been substantially reduced in the city.
- Phase 2 of the CCESP includes new combined and separate sewerage and drainage systems in Hai Dinh, Dong My, Hai Thanh, Nam Ly and Bac Ly Wards. Works have included interceptor sewers, pumping mains and pump stations along Nhat Le River, 9 CSOs, tertiary sewers and house connections in several wards, 13 pumping stations and a 10,000m3/d WWTP at Duc Ninh. The phase II is now being implemented, with expected completion in 2014.

However substantial funding shortfalls occurred for implementation of the CCESP due to high inflation in Vietnam from 2008-2012, resulting in substantially higher construction costs. Consequently, numerous aspects of the CCESP were unable to be completed. Duc Ninh being considered as a linked project, an environmental due diligence is presented in Appendix 2.

3.3.2.2. PROPOSED PROJECT

The PPTA technical team has studied the wastewater system shortages in close consultation and cooperation with the URENCO and proposes that the following works items be constructed under the ADB loan[4] to complement the WB project, with an overall objective to achieve wastewater flows to the WWTP that would bring the plant up to 100% operating capacity.

1) House connections (8,238) and associated tertiary sewers (55.6 km);
2) Extensions to primary and secondary sewerage/drainage network;
3) One pump station and one Combined Sewer Overflow (CSO);
4) Cleaning and inspection of existing combined sewers/drains (20 km) and rehabilitation (5 km);
5) High level alarms for all pump stations and CSOs;
6) Portable Closed Circuit Television (CCTV) pipes inspection equipment; and

It is also acknowledged that development of the Bao Ninh Peninsula is a priority for Dong Hoi City and Quang Binh provincial government. Consequently, the PPTA has developed a conceptual design of the essential primary and secondary sewers and pump stations for the Phase I development area, between the existing Nhat Le 1 Bridge and the Nhat Le 2 Bridge now under construction.

3.4. MAINSTREAMING CLIMATE CHANGE & DESIGN GUIDELINES

Details of specific climate proofing approaches and guidelines are provided in the PPTA Consultants detailed feasibility study report concerning the Dong Hoi Components. In summary adaptation of design parameters (particularly sea level, rainfall and temperature) should follow the MONRE (2012) guidelines as described in Section 4.5 below and specific sector standards.

In respect to sea and estuary dykes Sector standards/ regulation 1613/QD-NNN KHCN should be applied, issued July 9, 2012 (design standards of Sea river dykes carried by MARD). For river dykes Sector standards 4146/BNN-TCTL are valid, issued December 13, 2010 (standards of dyke grades, by/from MARD). Both of these standards include specific parameters in relation to climate change

The current standards for drainage do not allow for climate change and have also little flexibility in relation to design return period. It has therefore been included in the PPTA FSR Report to increase the safety factors in the design phase by increasing rainfall intensity by 10% and also increasing the rainfall-runoff factor by 10% (compared to those habitually taken).

3.5. ASSOCIATED FACILITIES (LINKED PROJECTS)

In accordance with ADB ESP, two on-going projects must be considered as associated facilities to the present project:

- The Nhat Le 2 bridge over the Nhat Le River, without which the improvement of the Bao Ninh roads and the Bao Ninh sanitation and drainage would not be operational;
- The Duc Ninh wastewater treatment plant without which the proposed sewerage improvement and extension sub-component for Dong Hoi should not be acceptable for environmental considerations (risk of river pollution).

In compliance with ADB ESP, an environmental due diligence was carried out by the Consultant for each project in order to ensure environmental and social issues have been addressed in the EIA documentation and major impacts well mitigated. The results of these due diligences are

[4] Latest discussions indicate this component could be only partially financed by ADB

summarized in the following sections (see detailed due diligence reports in Appendix 2 for each facility).

3.5.1. NHAT LE 2 BRIDGE

The Nhat Le 2 bridge is a major component of the proposed development planning of Bao Nhinh peninsula. This almost 1,000 billion VND project started officially construction on the 31 August 2012. It will be 515 m long and 23.6 m wide, with 4 lanes. The construction duration will be 36 months, fully compatible with the project schedule for Bao Ninh development.

The main sewer from Bao Ninh will cross the Nat Le river to its way to Duc Ninh WWTP using the Nat Le 2 bridge. This solution doesn't create any construction problem for the bridge as this main sewer from a pumping station is of small size, only 200 mm diameter.

The EIA was approved by Quang Binh PPC on the 9 September 2011 under the Decision No. 2285/QD-UBND.

NHAT LE BRIDGE OVER THE NHAT LE RIVER UNDER CONSTRUCTION

ARCHITECT VIEW OF THE NHAT LE 2BRIDGE

3.5.2. NEW WASTEWATER TREATMENT PLANT

The Duc Ninh Wastewater Treatment Plant EIA was carried out in 2010 by Thang Long Infrastructure Development Joint Company (Infra-THANGLONG). The report is available on the World Bank site. The wastewater treatment plant has a capacity of 10,000 m^3/day and is designed to be able to treat wastewater flow from Dong Hoi city up to 2020. However the land reservation of 14.5 ha includes already its extension to 19,000 m^3/day for the period 2020 to 2030. A 300 m width buffer zone, covering 25.9 ha is already planned for environmental reason (to avoid nuisance) presently used for agriculture but which does not involve land acquisition. The access to the main road is 1.36 km and 15 m wide (7 m for two lanes and 4 m on both sides, where the two pipelines are sited), covering an area of 2.7 ha.

The process is lagooning, involving successive treatment in aeration and facultative ponds after screening then grit and oil removal. Treated effluent is discharged into the Le Ky river. The treatment system includes:

- Two aeration ponds 4 m deep which will remove 50% of the influent BOD_5;
- Four facultative ponds 2.5 m deep, for removal of 90% of influent BOD_5; retention time in the ponds is >8.25 days;
- A maturation pond 1.5 m deep retains the effluent for 2 days for sterilization;
- An artificial wetland covered by water hyacinth (*Eichornia crassipes*) will receive the effluent for 2 days to complement the removal of nitrogen and phosphorus and to reach a BOD5<30 mg/l before discharging in the Le Ky river.

The WWTP is also equipped with a treatment unit for septic sludge from septic tank maintenance in Dong Hoi. The system has a treatment capacity of 8 m3/day, including 2 tanks of 12m3 capacity (3m depth/4m^2 area). After treatment by lime and pre-aeration, sludge is transferred to the WWTP aeration ponds.

Organic sludge is pumped from the facultative ponds and delivered to drying field. Treated effluent is discharged into the Le Ky river about 2 km upstream its confluence with Nhat Le rive. Effluent is expected to meet with grade 2 TCVN 7222:2002- General requirements on environment for concentrated wastewater treatment plant.

As the Duc Ninh Wastewater Treatment Plant is financed by the World Bank, the EIA was carried out in 2010 by Thang Long Infrastructure Development Joint Company (Infra-THANGLONG) following the WB safeguards. The report is still available on the World Bank site.

From the environmental point of view, there are not many comments to formulate as the EIA complies with the requirements of the WB, provides all the sections required for an EIA and an EMP raising mitigation measures and monitoring.

Figure [11] LOCATION OF THE DUC NINH WWTP

Source : PM Group, 2013

The main comment the PPTA formulates is the extremely poor level of environmental management enforcement as observed during the PPTA environmental and social teams visit in June 2013 on the construction site. Worker camps including canteen facilities are closer to slum than decent housing conditions as expected from a construction site. No particular attention is dedicated to the management of hazardous products and waste as oil: drums are disposed directly on the ground. This observation leads to the conclusion that the quality of the EIA is certainly required but not sufficient to ensure effective implementation of mitigation measures. Efficient and serious implementation of the mitigation measures from the EMP with a solid monitoring of the sites and a responsible follow up of the lending agency is a must to ensure achieving the objectives of good environmental practices.

ONE OF THE FACULTATIVE POND UNDER CONSTRUCTION

VERY POOR STANDARD FOR WORKER'S BUILDING INCLUDING KITCHEN

3.6. IMPLEMENTATION SCHEDULE

The schedule for project implementation is provided below.

Table [3] DONG HOI PROJECT IMPLEMENTATION SCHEDULE

	Activities	2013				2014				2015				2016				2017				2018				2019				2020			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Design & Monitoring Framework																																
Dong Hoi Wastewater Component																																
	Detailed Design & Engineering																															
	Acquire Land and implement resettlement																															
	Procure Works & Goods																															
	Construct & Commission Facilities																															
Bao Ninh Development Zone																																
	Detailed Design & Engineering																															
	Acquire Land and implement resettlement																															
	Procure Works & Goods																															
	Construct & Commission Facilities																															
Flood & Coastal Management																																
	Procure Works & Services																															
	Design and construct project facilities																															
Management Activities																																
	Develop Contract Packages & Procurement Plan																															
	Consultant Selection Procedures																															
	EMP Activities																															
	Communication Strategy Activities																															
	GAP Activities																															
	Annual/Mid Term Review																															
	Project Completion Report																															

Source : PM Group, 2013

oOo

4. BASELINE SITUATION

4.1. TOPOGRAPHY, GEOLOGY AND HYDROGEOLOGY

Geology of Dong Hoi presents the characteristics of a low coastal plain: stratum structure is formed by two main components, marine sediment and riverbed alluvium. Soil is mainly sand, clay, and a limited amount of gravel in layers varying in grain size distribution.

Dong Hoi has variety of terrain including hills, deltas, and coastal areas, resulting in a complex topography is, consisting of hills, flood plains and costal sand dunes. In the Eastern part of Nhat Le river is the Bao Ninh peninsula, consisting of a large sand deposit between the Nhat Le river and the China sea, with an average ground elevation is 10 m.

4.1.1. GEOLOGICAL HAZARDS

Vietnam consists of the following main tectonic units:

- The part of the territory from the Red River fault to the North of Vietnam belongs to the South Chinese active platform.
- From the Red River to Tra Bong fault is the North Vietnam folded system.
- From the Tra Bong fault to the Hau River fault belongs to the Indocini massif.
- Besides that, from the late Mesozoic division up to now the above mentioned regions are strongly reformed and divided into the Cenozoic basins: Hanoi basin in the North and Cuu Long basin in the South.

Vietnam has been classified as a low seismic region. In particular, Quang Binh Province Quang Binh Province can have low impact (or less) earthquake (on average one every 50 years), with strengths at <5 on the Richter Scale.

Results of the analysis of field survey data and historic literature documents in Vietnam reveal that there is evidence of past tsunami occurring along Vietnamese coast. The analysis on the seismic activities and structure of tectonic plates in the South China Sea (SCS) reveals that there are four areas in the sea with possibilities of having earthquakes which can then generate tsunamis. Based on the computed results by validated models, it was found that significant tsunami at Vietnamese coast could be generated by an earthquake with magnitude of larger than 7 at the fault along Central Vietnam shelf, and by an earthquake with magnitude of larger than 8 at the Manila Trench. If an earthquake with the magnitude of 7.5 happens at south Hainan Island, the maximum height of tsunami at Vietnamese coast can be more than 1.5m. The coast with the maximum tsunami height of more than 1m stretches about 1000km, from Quang Binh to Binh Thuan.

These events however can be considered to be extremely rare and of a lesser importance than risks related to tropical storms and typhoons (see sections below).

4.2. CLIMATE

4.2.1. GENERAL CLIMATIC CONDITIONS

Located in the tropical monsoon region of southern Vietnam, Dong Hoi shows high temperature year round and seasonal rainfall with the peak in October. Average monthly values of key climatic parameters are provided in the table below.

Table [4] MAIN CLIMATIC PARAMETERS

	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	AVE/ TOTAL
Temp. Average °C	25.1	17.8	18.5	21.4	26.3	29.2	30.1	29.7	29.2	26.8	25.6	24.8	25.4
Rainfall Avge mm	38.3	11.0	17.5	82.2	154.7	82.6	123.2	145.2	547	281.9	156.8	103.7	1744
Humidity %	88	90	89	87	80	72	69	75	84	86	85	85	83
ETP mm (*)	58	43	58	72	123	165	191	154	85	80	76	74	1178

Source : Hydrometeorological Data Center-MONRE, except ETP (Coastal cities environmental sanitary project)

Average humidity ranges 83 - 85% with maximum of 87% and minimum in summer as low as 50%. Dong Hoi presents two main wind seasons during the year: Winter wind mainly blows North West towards South East. Summer wind blows South West and South East. The characteristic of South West wind, the so-called “fon” wind, is dry and hot. Average evaporation is 85 to 90 mm/month.

4.2.2. TYPHOONS, STORMS & OTHER EXTREME EVENTS

Occurrence of typhoons is observed every year in Quang Binh. September and November are the two months showing the highest occurrence of these events, with 72% of the total storm recorded. During these events, maximum daily rainfall may reach 564 mm, with maximum wind speed of up to 38 m/s. From 2006 to 2012, the Province was hit by 13 typhoons, or an average of 2 typhoons per year, with a maximum of 4 typhoons in 2011.

Table [5] STORMS AND FLOODS IN QUANG BINH PROVINCE FROM 2005 TO 2010

YEAR	NO OF STORM	NO OF FLOOD
2006	2	3
2007	2	5
2008	1	3
2009	2	3
2010	1	2
2011	4	7
2012	1	0
Total	13	23
Mean	1.8	3.3

The last of these events, typhoon Wutip, a category 2 typhoon hit violently Dong Hoi on the 30 September 2013, leaving 5 dead and estimated damages over 200 million US$.

VIEWS OF DONG HOI DAMAGES AFTER TYPHOON WUTIP ON 30 SEPTEMBER 2013

ELECTRIC POLES BROKEN

FALLEN TREESELECTRIC/LIGHTING POLES

ELECTRIC AND TELEPHON LINES

THOUSAND HOUSES LOST THEIR ROOF

VOV STATION ANTENNA

SUN SPA RESORT, AT THE TIP OF BAO NINH WAS SERIOUSLY DAMAGED BY WUTIP

Consequently to theses climatic events, Quang Binh is also facing recurrent flooding, with a total of 23 flood events or an average of 3.1 floods/year for the period 1979-2010. This is discussed further below in this report.

4.3. HYDROLOGY

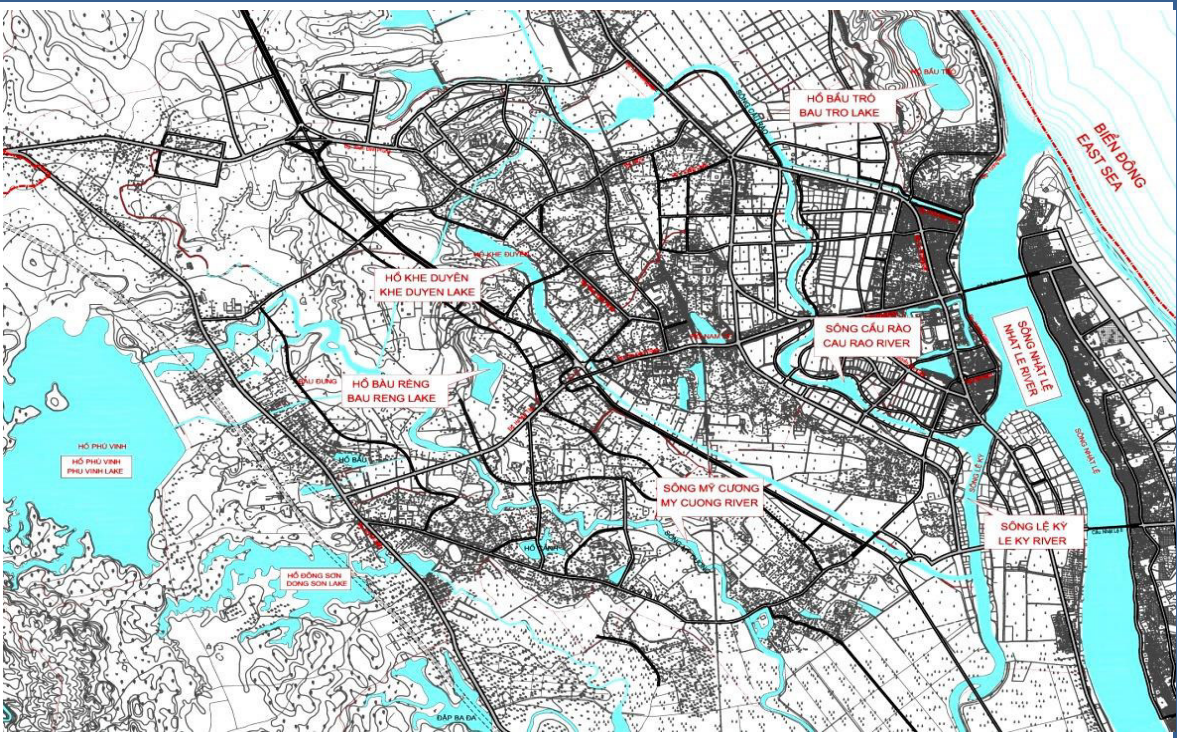
4.3.1. RIVER SYSTEM IN DONG HOI REGION

Dong Hoi is relatively close to the mountains in the West and to the Lao border. Due to this location the rivers coming down from the mountain range are relatively short with quite steep slopes.

Four main watercourses constitute the river system in the vicinity of Dong Hoi city, notably the Nhat Le, My Cuong, Cau Rao and Le Ky river.

- Nhat Le River is formed by the confluence of the Kien Giang River in Le Thuy and the Dai Giang River in Quang Ninh District. It is 152 km long including Kien Giang River (58 km) and Dại Giang River (77 km long). Nhat Le estuary opens on the sea at Dong Hoi.
- My Cuong River drains areas of Dong Son, Thuan Duc, Bac Nghia wards and Nghia Ninh and Duc Ninh communes. It starts from Phu Vinh Dam in Thuan Duc and runs Northwest to Southeast direction before its confluence with the Nhat Le River at Quang Ninh commune. My Cuong river is 16 km long, with an average width of 80m. The maximum flow Qmax is 350 m3/s, and the minimum flow Qmin is only 0.25 m3/s. The river is narrow and turbid with saline water reaching over till My Cuong bridge.
- Cau Rao River (also named Luy river) flows from the junction (triple-crossing) between Phong Thuy canal and the canal of Loc Ninh commune's rice field, with a total length of 4.5 km, and crossing the city from North to South before running in Le Ky river. The dredging of the last 300 m reach of the Cau Rao before it joins the Nhat Le is proposed as a sub-component of the present project.
- Le Ky River originates from high mountains in Quang Ninh district and runs around the Dong Hoi city before it joins the Nhat Le. It is 20km long with an average width of 200m. The catchment area is 90km², with a Qmax of 630 m3/s and a Qmin of 3.1 m3/s. The Le Ky will be the receiving river for the treated effluents from the new Duc Ninh wastewater treatment plant already under construction.

Figure [12] RIVER SYSTEM IN DONG HOI



Source : PM Group, 2013

4.3.2. TIDAL EFFECTS IN THE ESTUARY

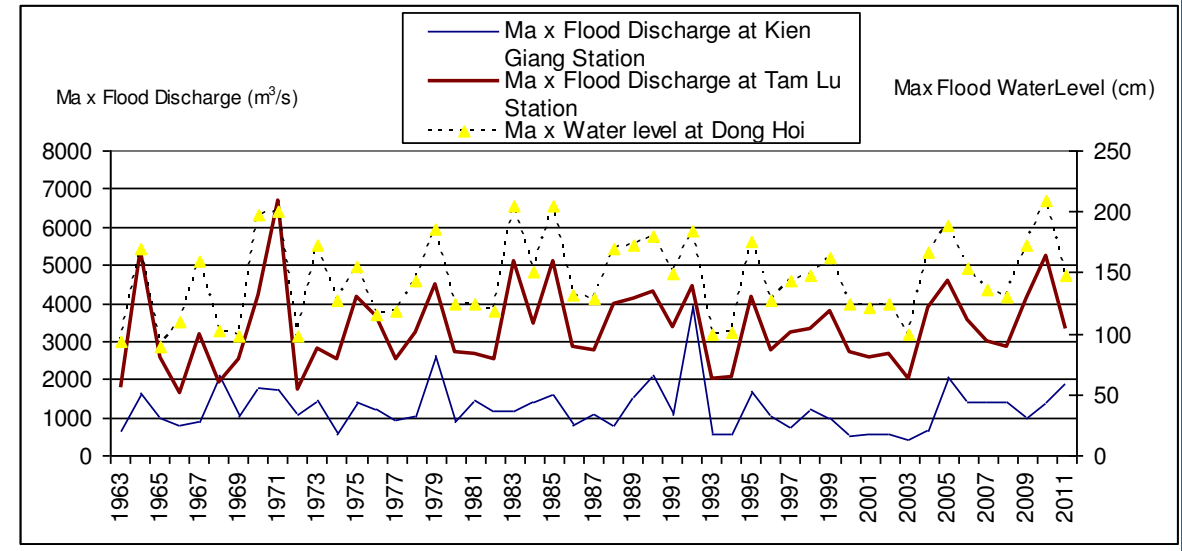
The section of Nhat Le crossing Dong Hoi is affected by tidal motion from the sea, monitored by a water level control station (Dong Hoi Station) located near Nhat Le 1 bridge. The Nhat Le estuary has a semi-diurnal tidal regime with average amplitude of 1.4 m and a maximum of 1.5 m. In the dry season the tidal influence reaches till Phan Xa (on Kien Giang river, 45 km from Dong Hoi) and at Long Dai (Dai Giang river, 20.4 km from Dong Hoi). Tidal amplitudes are about 0.10 to 0.20 m at Phan Xa and 0.1 m at Long Dai (bridge) in the dry season.

4.3.3. DISCHARGES AND FLOODS

Nhat Le river basin has an overall catchment area of 2,650 km2, and an average rainfall of 2500 mm per year. The average annual flow is 120 m^3/s with a specific discharge of 47 l/s/km². Overall annual on average is 3.97 BCM. The flood season covers 77% of the total annual discharge, the dry season 23%.

Floods in Nhat Le river are affected by the discharges in Kien Giang and Dai Giang rivers, local rainfall, and the tidal water level. The annual maximum flood peaks on Kien Giang river at Kien Giang station, and Dai Giang river at Tam Lu station, as well as the annual maximum water level on Nhat Le river at Dong Hoi station are displayed in following Figure.

Figure [13] MAXIMUM FLOOD PEAKS AND WATER LEVELS ON KIEN GIANG



Source : PM Group, 2013

Maximum flood discharges measured in the Dai Giang river at Tam Lu station are 6,710 m3/s (Oct 24, 1971), and 3,932 m^3/s (Oct 7, 1992) at Kien Giang station on Kien Giang River. However, the maximum water level at Dong Hoi station on the Nhat Le river occurred in Oct 4, 2010 reaching a water level of 2.09 m. Apparently, flood peaks of Kien Giang and Dai Giang branches do generally not coincide due to different rainfall distribution patterns in the catchments.

As presented in the following Table, damages from storms and floods are significant:

Table [6] DAMAGES FROM STORMS AND FLOODS IN QUANG BINH PROVINCE

YEAR	2006	2007	2008	2009	2010	2011	2012	TOTAL
The number of typhoons affecting QuangBinh	2	2	1	2	1	4	1	13
Floods affecting QuangBinh	3	5	3	3	2	7	0	23
Number of death (persons)	9	25	12	4	59	7	1	117
Number of injured (persons)	8	148	46	16	239	20	0	477
Collapsed, flushed away houses (Items)	62	735	52	31	419	1	0	1,300
Flooded houses (Items)	0	139,358	19,917	35,335	169,943	24,589	19	389,161
Affected schools (items)		73	190	246	439	47	0	995
Affected medical stations (Items)	18	27	82	29	109	20	0	285
Damaged rice paddy fields (Ha)	7,039	8,701	502	386	3,819	798	423	21,668

YEAR	2006	2007	2008	2009	2010	2011	2012	TOTAL
Damaged crops (Ha)	1,957	3,372	4,226	2,951	6,611	2,661	796	22,574
Aquaculture damages (Ha)	480	130	748	19,564	2,372	357	33	23,684
Damaged, sunk boats (Items)	0	94	43	0	139	0	1	277

4.3.4. FLOOD CONTROL INFRASTRUCTURE

The overall physical infrastructure to control floods in the Nhat Le river and estuary consists of river and sea dykes, a number of reservoirs, and some retention areas.

The river dike system in Nhat Le river basin consists of 89 km dykes, of which 27.7 km is in Dong Hoi city. The river dykes in Dong Hoi City consist of 13.5 km on the left and 2.5 km on the right of Le Ky river, 4.3 km (Nhat Le-Bao Ninh) on the left of Nhat Le River, 5.7 km of dykes on the left of Nhat Le –Bau To, and 1.7 km dyke/embankments on the left of Nhat Le river. The design elevation of Dikes is from 2.5 to 3.0 m, which is built up by design water level, wave run-up (if relevant) and an additional safety height.

The river embankment system in the Nhat Le river basin has a length of 37.33 km, of which 12.99 km is in the river system in Dong Hoi city, which consists of 4.71 km on the left and 1.5 km on the right of Le Ky river, 1.38 km on the left of Nhat Le River (Nhat Le – Bao Ninh), 4.4 km on the left of Nhat Le river from Nhat Le to Bau Tro, and 1.0 km on the left of Nhat Le river. The dykes and embankments generally are in a reasonable state, but at many places the existing dyke crest is about 0.6 to 0.7 m below the design elevation. Moreover, many dyke sections have no specific protection or hard embankment and are therefore exposed to riverbank erosion.

At present 47 reservoirs have been constructed in the Nhat Le River basin of which 13 reservoirs are located in Dong Hoi City. The total live storage amounts to 247 MCM in which of the live storages capacity in Dong Hoi City is 22.5 MCM. There are only 6 reservoirs having a significant live storage: Phu Vin located in Dong Hoi city (17.6 MCM), An Ma located in Le Thuy district (67.85 MCM), RaoDa located in Quang Ninh district (82.26 MCM), Cam Ly located in Le Thuy district (42.0 MCM), Phu Hoa located in Le Thuy district (8.6 MCM), Thanh Son located in Le Thuy district (6.1 MCM). These reservoirs only supply water for irrigation and domestic use. There is no objective nor availability for flood control as the flood storage is too small. They can only be used for mitigating early floods that have small flood peak discharges.

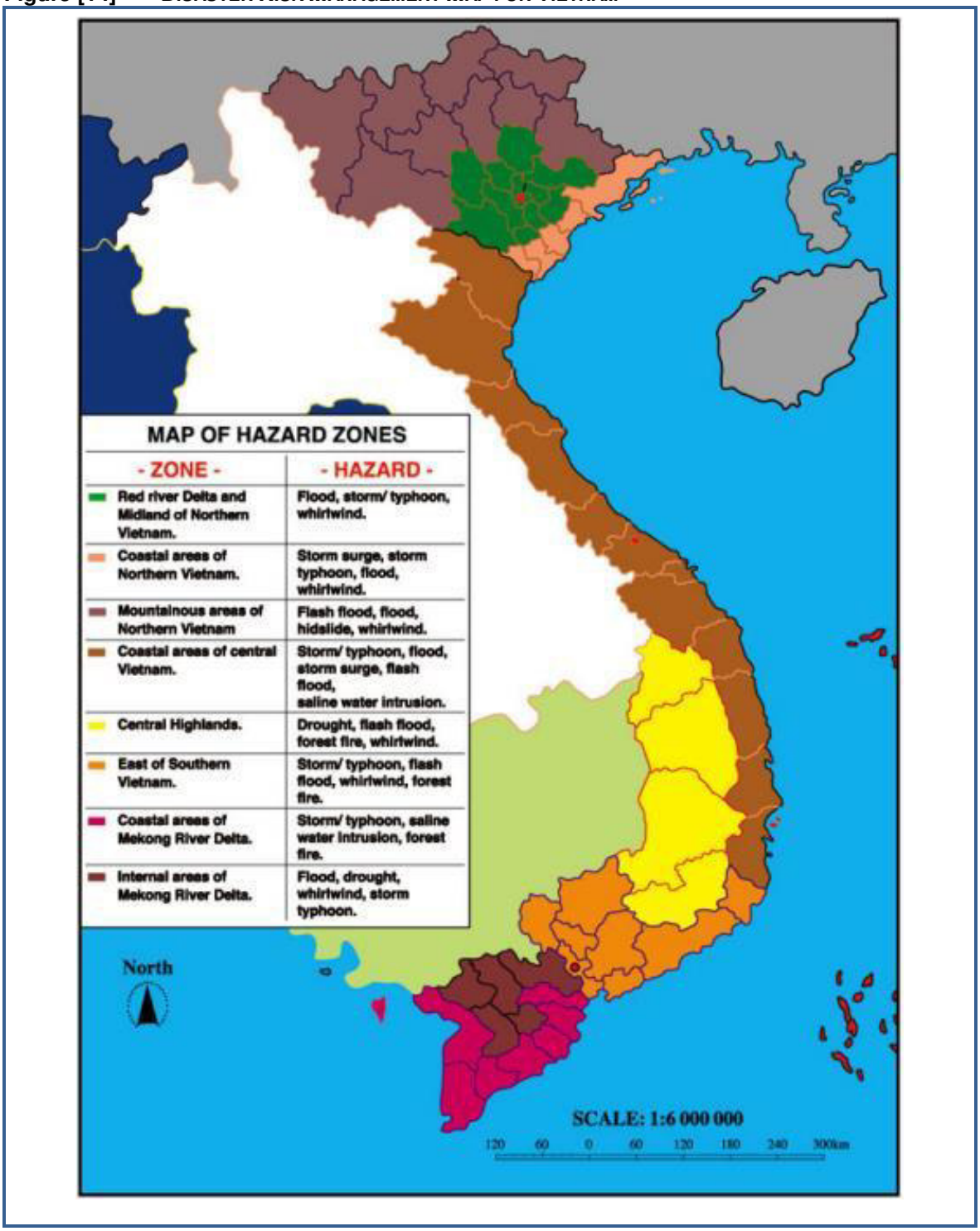
RIVERBANK PROTECTION (JUNCTION NHAT LE - LE KY RIVERS

BANK PROTECTION ON BAO NINH NEXT TO NHAT LE 1 BRIDGE

4.4. COASTAL EROSION

The coastal area of Central Vietnam is quite exposed to typhoons and other natural disasters. Apart from the rainstorms/ typhoons it has a high vulnerability for river floods, flash floods, storm surges, salinity intrusion and tsunami's.

Figure [14] DISASTER RISK MANAGEMENT MAP FOR VIETNAM



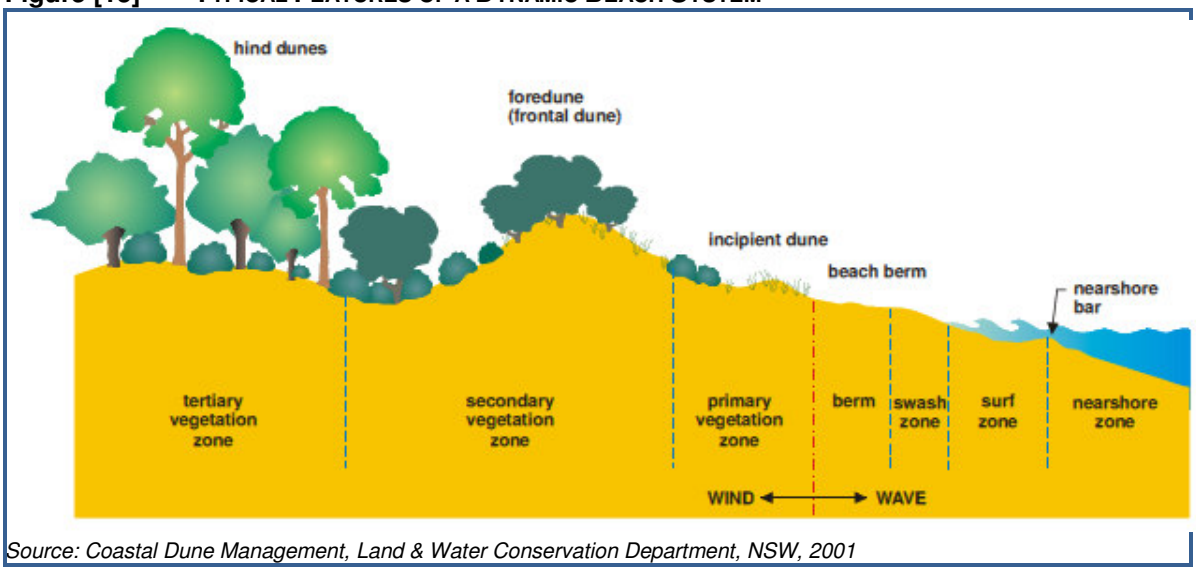
As a result, at many places along the coast, including Quang Binh province and Dong Hoi, severe erosion continually takes place. This specifically creates problems at or near

coastal cities, coastal power plants or industrial developments, popular beaches and/or for coastal resorts. However, if erosion takes place, the main cause in many places is an unsustainable development of the coastal areas which threatens the sensitive balance between the coastal dune, the beach and the sea. This is particularly well illustrated in Bao Ninh.

4.4.1. THE ROLE OF THE COASTAL DUNE SYSTEM

Before going to the situation in Bao Ninh, it seems worth to remember the role of the coastal dune system in the overall stability of the coastline. On sandy shorelines, coastal dunes represent the last line of defense against erosion by providing a reservoir of sand for waves to utilize during storms. As well as limiting the landward intrusion of waves, wind and salt spray, dunes act as a barrier to oceanic inundation and they provide for an important morphological and ecological transition from marine to terrestrial environments. A typical beach system is depicted in the following figure.

Figure [15] TYPICAL FEATURES OF A DYNAMIC BEACH SYSTEM



Source: Coastal Dune Management, Land & Water Conservation Department, NSW, 2001

Coastal dunes are accumulations of wind-blown (aeolian) sand located behind the beach. Near their seaward margins, aeolian deposits are intermixed with wave deposited beach sands but as distance from the shore increases, wind action becomes the dominant force. The nature and extent of dune development at any location is governed by a number of factors including the amount and size of sand currently being supplied to the beach itself, patterns of wind strength and direction, embayment topography and orientation, and the type of beach. Typically, an undisturbed beach will be backed by a foredune (also known as a frontal dune) and hind dunes. Vegetation cover is a crucial element in the evolution of dune landscapes. Wind velocity is generally reduced by plant cover, encouraging deposition and trapping of wind borne sand.

The dune plays a fundamental role in the general erosion/accretion balance of the beach system, provides a sand reserve particularly during storms events which may, like in Dong Hoi, be extremely violent. Where there is an inadequate dune, properties and facilities near the back of the beach may be subject to inundation from the ocean, to structural damage from wave attack, undermining by foreshore erosion, or to sand drift. The presence of a stable dune system provides a natural defense mechanism against these hazards.

4.4.2. SITUATION OF THE BAO NINH PENINSULA

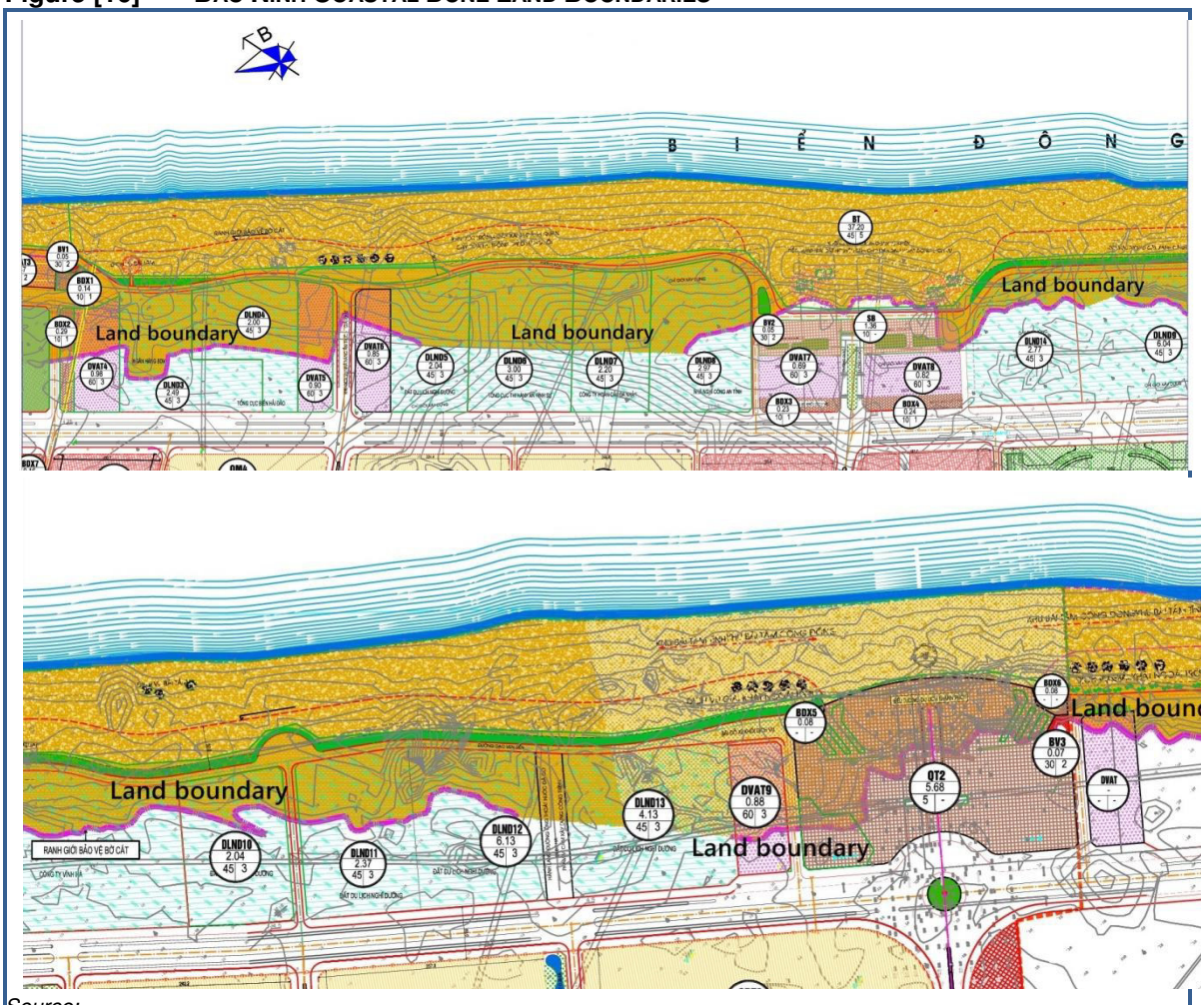
The urban development on the Bao Ninh peninsula since 2011has caused wide-spread destruction of the existing natural dune system. For the construction of a storm water drainage system for the 60 m wide central road five corridors have been dug in the dune area for drainage pipe outlets to

the sea. In addition there is an open channel draining storm water into the sea. Consequently, the sand dune system has been cut into 7 isolated sections. Especially the bare sand slopes of these corridors are vulnerable for erosion by wind and stormwater. In addition, access roads to the beach have been created promoting illegal and uncontrollable sand mining at the cutting location.

More important, the presently divided sand dune system on Bao Ninh peninsula has lost its protective function for the area behind the dunes during extreme weather conditions such as tropical storms and sea level rise in future. The development of 6 resorts and hotels in the dune area bordering the beach, 2 of which being in operation since 2012, has cut through the land boundary of the sand dune system.

The natural boundary of coastal sand dune system along the Bao Ninh peninsula, from square to the end of 60 meter road has been broken. Based on 2010 topographical map from the Quang Binh Institute of Planning and high resolution satellite images (2011 Spot Image, from Google Earth), the natural boundary of coastal sand dune is running in parallel to the old 9 meters road, and about 200 m from the shoreline. The sea-boundary of the dune system corresponds to the mean high water (equivalent to H2% of +2.03 m) and the land boundary of the dune locates at the elevation of + 2.5 to + 3.0 m. This is depicted in the following figure which presents the dune system boundaries for Bao Ninh.

Figure [16] BAO NINH COASTAL DUNE LAND BOUNDARIES



Source:

From these maps, it is observed that several development plots for resorts are already implemented beyond the land boundary of the costal dune system, with a potential decrease of the natural protection of the area which may create medium term threats on these developments. Furthermore, on-going developments observed involve also the

leveling of the dune and the destruction of its natural vegetation which will lead to increased erosion by wind and water.

SEA LIGHT RESORT: DUNE HAS BEEN LEVELED AND PROTECTIVE VEGETATION REMOVED

FENCE IS VERY CLOSE TO THE HIGH WATER LINE AND THE FOREDUNE ALREADY DESTROYED

Further south to the end of the 60 m wide road, the natural dune system is still in good condition. It needs to be preserved for future adaptation to climate change.

At the extreme north of Bao Ninh peninsula is located the Sun Spa resort, at the tip of the sand spit where the Nhat Le river opens to the sea. Because of the highly hydrodynamic situation of this sand spit between the sea and the river, its length shows considerable variations during the last years. Furthermore, accretion of the beach line in the dry period and erosion during the stormier wet period is observed as a natural phenomenon.

Therefore the designers decided to construct two ring walls around the resort. The first consists of a wall made of concrete piles and a capping beam surrounding the buildings, top level at + 6.5m. The second wall forms the distinctive boundary with the beach itself and marks the start of the beach. It is of similar construction and its top level is +4.5m. The third one was added later because erosion threatened the beach and the basis of the 2nd wall. Its top level is at +3.3m. The distance between the first and second wall varies from 15 to 20 m, while the distance between the second and the third wall is 10 m.

Since some years, parts of the new wall suffered severe damages. Over a distance of about 20 m it has toppled over, because the foreshore was eroded, diminishing the stability of the piled structure. Sand has disappeared over a considerable length from the inner side (between 3rd and 2nd walls), removed by wave attack, pushing water through gaps at a lower level in the concrete wall. Tentative repairs using geotextile were not successful as can be seen on the pictures below. The situation at present has deteriorated severely. Following pictures taken before the typhoon Wutip of 30 September 2013 struck show already extensive loss of sand between the two sea walls, gaps in the outer sea wall causing erosion at the foot of the main, middle sea wall, the structural border of the resort area.

The present situation in Bao Ninh shows that the protection of the coastal dune system is a prerequisite to sustainable tourism development of the area. Without respecting minimum rules in terms of land use, most of the investments will be threaten by coastal erosion even strengthen by the phenomenon of climate change and sea level rise as presented in the following section of this report.

SUN SPA RESORT: VIEW OF 2ND WALL (CENTER) AND 3RD DAMAGED WALL (LEFT)

SAND BEING LOST FROM THE SPACE BETWEEN 2ND AND 3RD WALL (07/2013)

THIRD WALL OVERTOPPED BY THE WAVES

MAIN SEAWALL UNDER DIRECT WAVE ATTACK

4.5. CLIMATE CHANGE IN QUANG BINH PROVINCE

Vietnam is likely to be one of the several countries most adversely affected by climate change. During the last 50 years, Vietnam's annual average surface temperature has increased by approximately 0.5 to 0.7°C, while the sea level along the coastline has risen by approximately 20 cm. Climate change has resulted in more severe and/or frequent occurrences of natural disasters, especially cyclonic storms, floods and droughts becoming more extreme.

Recognizing potential and long term spatial impacts of climate change, Vietnam has looked forwards to developing its long term policies on climate change mitigation and adaptation and has attached much more significance to the mainstreaming of climate change responsive solutions international socio-economic development strategies, policies and plans with a view of achieving the sustainable development of the country.

Together with the World's community, Vietnam committed to combat against climate change through the ratification the UNFCCC, the approval of the National Target Program to Respond to Climate Change and more recently the preparation of the Climate Change and Sea Level Rise Scenarios for Vietnam. The last up-dating of the simulations scenarios has been presented in 2012. These scenarios which provide projections by the middle and by the end of the present century provide applicable safeguards for any project with components relevant to CC aspects. As such, these projections are used as references by the Consultant during the present PPTA to design Project's components. The main conclusions of the last scenarios simulations are summarized below.

4.5.1. BASELINE SCENARIOS FOR GHG EMISSIONS CONSIDERED

The Inter-Governmental Panel on Climate Change (IPCC) published in 2000 a series of projected greenhouse gas emissions scenarios that could be used to assess potential climate change

impacts in the world. The Special Report on Emission Scenarios, known as the 'SRES scenarios', grouped scenarios into four families of greenhouse gas emissions (A1, A2, B1, and B2) that explore alternative development pathways, covering a wide range of demographic, economic, and technological driving forces:

- A1-scenario: the story line assumes a world of very rapid economic growth, a global population that peaks mid-century and the rapid introduction of new and more efficient technologies. A1 is divided into three groups that describe alternative directions of technological change: fossil intensive (A1Fi), non-fossil energy resources (A1T), and a balance across all sources (A1B).
- B1-scenario: it describes a convergent world, with the same global population as A1, but with more rapid changes in economic structures toward a service and information economy.
- B2-scenario: describes a world with intermediate population and economic growth, emphasizing local solutions to economic, social, and environmental sustainability.
- A2-scenario: describes a very heterogeneous world with high population growth, slow economic development and slow technological change.

The climate change and sea level rise scenarios developed and published for Vietnam in 2009 were based on the low (B1), medium (B2) and high (A2, A1Fi) scenarios. The average B2 scenario was recommended for all Ministries, sectors and localities to initially assess the impact of climate change and sea level rise and to build action plans to respond to climate change. Using results of previous studies as a basis, the 2011 updated climate change and sea level rise modeling selected the following greenhouse gas emissions scenarios: B1 (low scenario), B2, A1B (middle scenario), A2 and A1Fi (high scenario).

Climate Change scenarios for temperature and rainfall were developed for seven climate zones in Vietnam in 2009 Report (North West, North East, North Delta, North Central, South Central, Central Highlands, and South), and for each Province of Vietnam in 2012 Report. The baseline reference period is 1980-1999. The information provided below refers to the 2012 report.

4.5.2. SCENARIOS FOR TEMPERATURE CHANGE

- Low emission scenario (B1): by the end of the 21st century, annual mean temperature in most of areas of the Northern Vietnam (from Thua Thien-Hue back to the North) would increase by 1.6 to 2.2°C relatively to the baseline period (1980-1999). The increase in temperature in Southern zones (from Quang Nam to the South) will range from 1.0 to 1.6°C.
- Medium emission scenarios (B2): by the middle of the 21st century, annual mean temperature in most of country would increase by 1.2 to 1.6°C. Areas from Ha Tinh to Quang Tri, including Quang Binh would increase by 1.6 to 1.8°C. By the end of the century, annual mean temperature would increase by 1.9 to 3.1°C in most of the regions, Temperature in areas from Ha Tinh to Quang Tri, including Quang Binh are forecasted to increase by 3.1 to 3.3°C. Number of days with maximum temperature higher than 35°C would increase by about 15 to 30 days.
- High emission scenario (A2): by the end of the century, annual mean temperature in most of the regions would increase by 2.5 to more than 3.7°C. The lowest forecasted change in temperature will be in a part of Central Highland and South West zones ranging from 1.6 to 2.5°C.

4.5.3. SCENARIOS FOR RAINFALL EVOLUTION

Rainfall in dry season is expected to decrease in most regions of Vietnam, particularly in the southern region. Rainfall during the rainy season and the total annual rainfall are forecasted to increase in all zones.

- Low emission scenario (B1): By the end of the 21st century, annual rainfall would increase in most of the country by about 6% relatively to the reference period 1980-1999. In Central Highland, the increase could be lower, less than 2%.
- Medium emission scenarios (B2): By the end of the century, annual rainfall would increase by about 2 to 7% in most of the regions. In Central Highland and South Central, including Quang Nam, forecast is an increase lower than 3% (2.7% for Quang Nam). In general, the dry season rainfall would decrease and rainy season rainfall would increase. Maximum dayly rainfall would increase in the North and North Central zones (including in Quang Binh) and decrease in South Central Zones (including Quang Nam) and in the Central Highland the South zones. However, extraordinary daily rainfall may occur in various zones with rainfall about 2 times higher than present maximum daily rainfall.
- High emission scenario (A2): By the end of the century, annual rainfall would increase by about 2 to 10 % in most of the country. In Central Highland, increase would be more limited, about 1 to 4% only.

4.5.4. SCENARIOS FOR SEA RISE LEVEL EVOLUTION

- Low emission scenario (B1): By the end of 21st century, highest sea level in zones from Ca Mau to Kien Giang will rise by about 54 to 72 cm. Lowest sea level rise is forecasted in areas from Mong Cai to Hon Dau by about 42-57 cm. In average sea level rise in most of coastal zones of Vietnam is anticipated to be about 49 to 64 cm.
- Medium emission scenarios (B2): By the end of the century, highest sea level rise will occur in the area from Ca Mau to Kien Giang, and would be about 62 to 82 cm. The lowest sea level rise is anticipated in the area from Mong Cai to Hon Dau, with 49 to 74 cm. In average for the coastal areas of Vietnam, sea level rise would be about 57 to 73 cm. In Quang Binh, the rise is forecasted to be 60 to 71 cm and in Quang Nam 61 to 74 cm.
- If the sea level rises by 100 cm, it is anticipated that about 39% of Cuu Long Delta, more than 10% of Hong river Delta & Quang Ninh, more than 2.5 % of Central Costal Provinces, and more than 20% of Ho Chi Minh City will be flooded. Approximately 35 % of the population of Cuu Long Delta Provinces, more than 9% of the population of Hong river Delta & Quang Ninh, about 9 % of the population of Central Costal Provinces and 7% of the population of Ho Chi Minh City will be directly affected. More than 4% of the railway network, more than 9% of the national road network and about 12% of the provincial road network will be affected.

4.5.5. EVOLUTION OF VIETNAM CC SCENARIOS

Climate change scenarios were initially prepared for Vietnam in 2009. The technical studies of the Project components already carried out for Dong Hoi integrate the CC previsions from these 2009 scenarios. However, significant changes have been considered by the Government of Vietnam when updating the information in 2012. The following table presents the 2009 and 2012 CC forecasts for Quang Binh Province and for two target periods, mid-century and the end of the century (2050 and 2099). All values are anticipated changes compared to the reference period 1980-1999.

Table [7] CHANGES IN CC SCENARIOS BETWEEN 2009 AND 2012

PROVINCE	QUANG BINH (DONG HOI)			
TARGET PERIOD	2050		2099	
SCENARIOS	2009	2012	2009	2012
Temperatures Increase (°c)	+1.3	+1.7	+2.8	+3.1
Changes in annual Rainfall (mm)	+4.0	+2.5	+7.7	+4.7
Sea Level Rise (cm)	+30	+23-25	+75	+60-71

Source: Ministry of Natural Resources and Environment

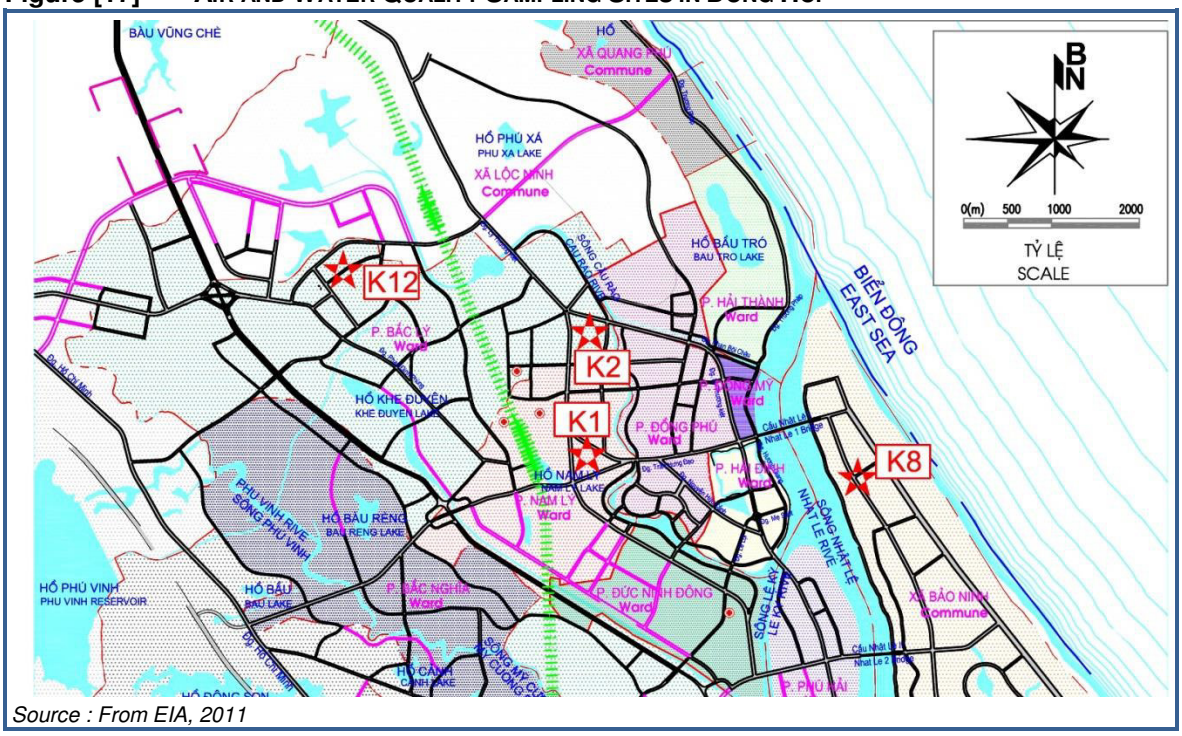
By Comparison to the 2009 scenarios, the 2012 scenarios were formulated based on more accurate data and observations made in 2010 as well as more efficient statistical tools targeted only for Vietnam. Results are also more detailed, going up to the Provincial level and specific to coastal regions. The new scenarios are expected to help the Ministries and Agencies to work out plan of response, better adaptation and reduction of potential damages from climate change.

4.6. AIR QUALITY AND NOISE

Air quality was measured in May 2011 in 3 stations distributed in Dong Hoi City, of which 2 stations in Dong Hoi City's Center and 1 station in Bao Ninh Commune. The results indicated levels of noise, dust (Total Suspended Particulates), lead, CO_2 NOX, and SO_2compliant with permitted standard as per QCVN 05:2009/BTNMT. This concerns particularly locations affected by transportation activities as Tran Hung Dao Street, Hung Vuong Street, Ly Thuong Kiet Street.

According to data from the "Status of the Environment 2006-2010 of Quang Binh "(DONRE, 2005-2009), the results of air quality measurements in 12 stations of Quang Binh Province, were mostly compliant with permitted standards, with some exceptions related to noise resulting from road traffic activities.

Figure [17] AIR AND WATER QUALITY SAMPLING SITES IN DONG HOI



Source : From EIA, 2011

Table [8] AIR QUALITY IN DONG HOI CITY - MAY 2011

NO	MONITORING LOCATION	TPS MG/M^3	CO MG/M^3	SO2 MG/M^3	NO2 MG/M^3	NOISE DB(A)
K1	Crossroad of Quang Binh Post Office	0,136	8,015	0,079	0,075	73,4
K2	T-Junction of Bac Ly Market	0,101	5,705	0,078	0,113	74,7
K8	Bao Ninh Penisula –Dong Hoi City	0,029	ND	ND	ND	63,4
K12	The Gate of VINESCO12- Industrial Zone in Dong Hoi City's North-West side)	0,042	2,282	0,026	0,019	65,7

No	Monitoring Location	TPS mg/m^3	CO mg/m^3	SO2 mg/m^3	NO2 mg/m^3	Noise dB(A)
	Vietnam Standards					
	QCVN 05:2009/BTNMT: National Technical Regulation on ambient air quality (average 1 hour)	0.30	30	0.35	0.20	NA
	QCVN 26:2010/BTNMT National Technical Regulation on Noise	Sensitive areas (Hospital, school, etc.)			6:00 to 21:00 hrs 21:00 to 6:00 hrs	55 45
		Residential area, office			6:00 to 21:00 hrs 21:00 to 6:00 hrs	70 55

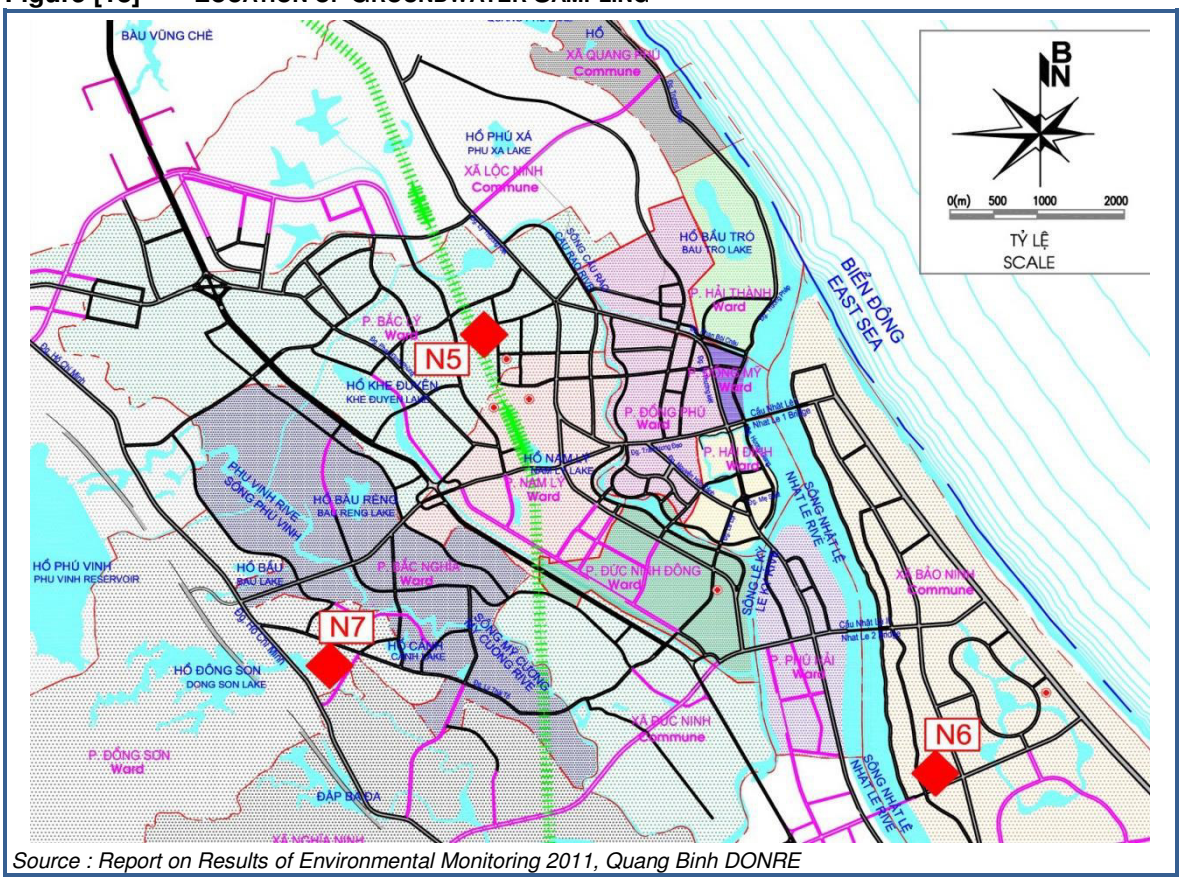
Source: Report on Results of Environmental Monitoring 2011, Quang Binh DONRE
ND : Non detectable

4.7. Underground Water Quality

Assessment of the groundwater quality of Dong Hoi City is based

- On the results of water quality sampling and analysis carried out in May 2011 in 3 stations distributed among wards of Dong Hoi City by the Quang Binh Environmental Engineering & Monitoring Center (DONRE):
  - N5: Drilling well at ASIA VINA - TAIWAN Allumium Factory in Dong Hoi City,
  - N6: Drilling well in Cua Phu Village - Bao Ninh Commune in Dong Hoi City,
  - N7: Drilling well in Dong Son Ward in Dong Hoi City.
- On the results of groundwater quality surveys carried out by Quang Binh DONRE over the period 2006-2010.

Figure [18] Location of Groundwater Sampling



Source : Report on Results of Environmental Monitoring 2011, Quang Binh DONRE

Results of water quality surveys from 2005-2009 and from May 2011, presented in the following table, show that most of the measured parameters are compliant with the permissible levels, except for coliforms which exceed the permitted value. Level of water quality refers to Standard QCVN 09:2008/BTNMT (National Technical Regulation on Groundwater).

Table [9] GROUNDWATER QUALITY IN DONG HOI CITY (MAY 2011)

NO	PARAMETER AND SUBSTANCE	UNIT	RESULTS			VIETNAM STANDARDS QCVN 09: 2008/BTNMT
			N_5	N_6	N_7	
1	pH		7,12	6,7	7.22	5,5 - 8,5
2	Color	-	13	10	6	-
3	Hardness (as CaCO3)	mg/l	212	108	143	≤ 500
4	Total solids	mg/l	224	212	314	≤ 1500
5	COD ($KMnO_4$)	mg/l	4	3	1	≤ 4
6	Arsenic	mg/l	0,001	0,001	<0,001	≤ 0,05
7	Cadimium	mg/l	0,002	0,002	0,001	≤ 0,005
8	Chloride	mg/l	12	12	10,2	≤ 250
9	Fluoride	mg/l	0,09	0,02	0,12	≤ 1,0
10	Chromium(VI)	mg/l	0,008	0,007	0,002	≤ 0,05
11	Cyanide	mg/l	0,004	0,006	0,006	≤ 0,01
12	Copper	mg/l	0,09	0,12	0,02	≤ 1,0
13	Zinc	mg/l	0,03	0,05	0,04	≤ 3,0
14	Manganese	mg/l	0,2	0,3	0,1	≤ 0,5
15	Nitrite (as N)	mg/l	0,005	0,004	0,002	≤ 0,1
16	Nitrate (as N)	mg/l	0,4	1,4	0,2	≤ 15
17	Ammonia (as N)	mg/l	0,02	0,08	0,02	≤ 1,0
18	Iron	mg/l	0,41	0,09	0,02	≤ 5
19	Sulphate	mg/l	7	4	3	≤ 400
20	Coliforms	MPN/100ml	8	14	10	≤ 3
21	Fecal coliform	MPN/100ml	2	1	1	not detectable

Source: Report on Results of Environmental Monitoring 2011, Quang Binh DONRE

4.8. SURFACE WATER QUALITY

Assessment of the surface water quality of Dong Hoi City is based:

- on the results of water quality sampling and analysis carried out in June 2011 in 2 station of the Nhat Le river, 2 station in reservoirs and 2 station in coastal waters distributed in the Dong Hoi area, by the Quang Binh Environmental Engineering & Monitoring Center (DONRE);
- on the results of surface water quality surveys carried out by DONRE over the period 2006-2010 .

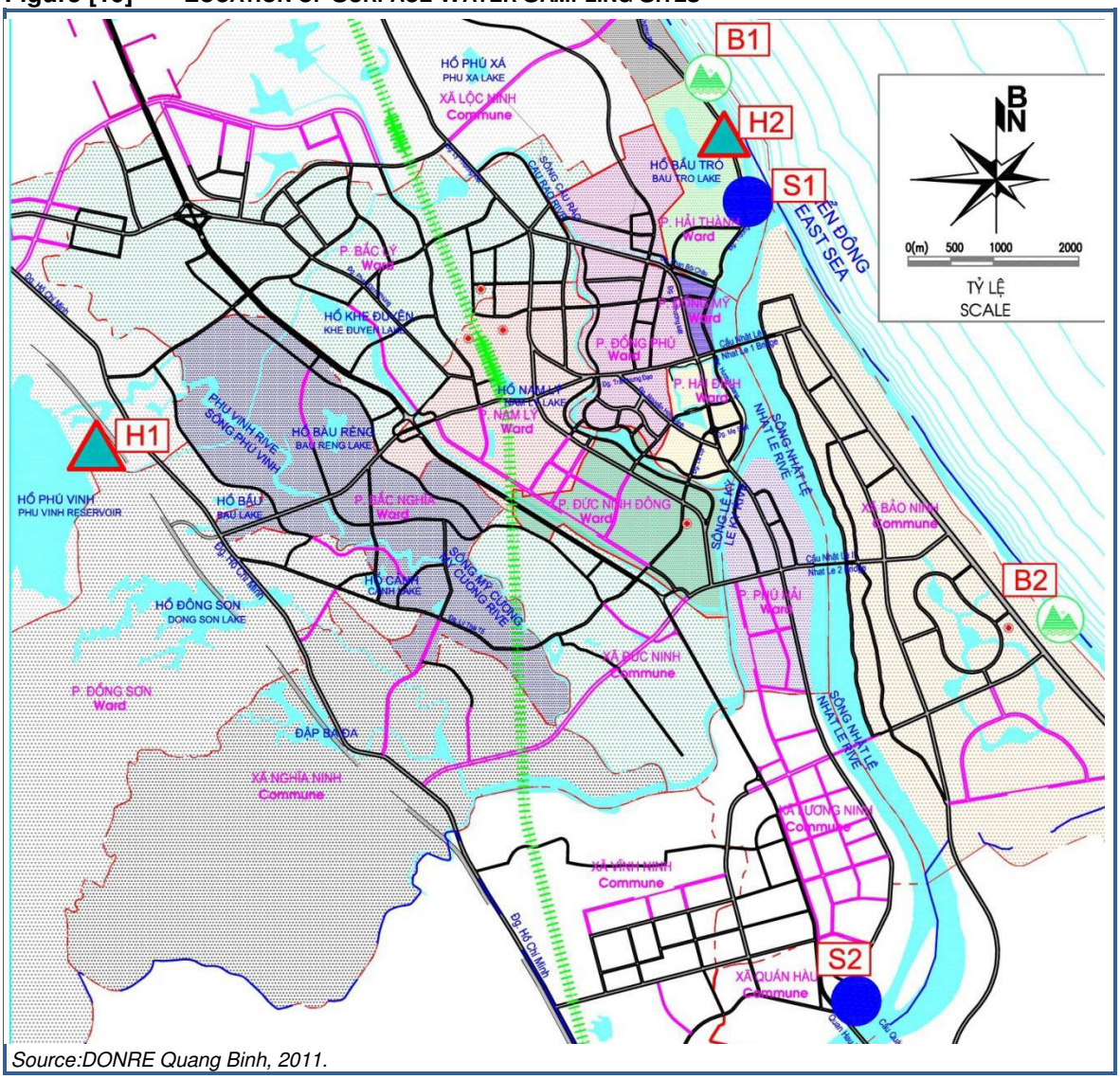
Level of water quality refers to Standard QCVN 08:2008/BTNMT (National Technical Regulation on Surface Water Quality for domestic use, for irrigation and for water ways and navigation) for inland waters, to Standard QCVN 10:2008/BTNMT (National technical regulation on coastal water quality) for coastal sea waters, to Standard TCVN 6774:2000 (Freshwater quality guidelines for the protection of aquatic life).

Standard QCVN 08:2008/BTNMT considers 4 water quality levels:

- A1&A2: Water suitable for domestic water supply with disinfection treatment (Col. A1) and with more elaborated treatment (col.2);
- B1: Water suitable for irrigation;

- B2: Water suitable for waterways and navigation;

Figure [19] LOCATION OF SURFACE WATER SAMPLING SITES



Source:DONRE Quang Binh, 2011.

Table [10] RIVER & RESERVOIR WATER QUALITY IN DONG HOI CITY (MAY 2011)

PARAMETER	UNIT	LOCATION				QCVN 08: 2008	
		RIVER		RESERVOIR		COLUMN A2	COLUMN B1
		S1	S2	H1	H2		
pH	pH unit	7,56	7,31	8,64	8,21	6 - 8,5	5,5 - 9
Temperature	°C	28,1	28,8	27,6	26,3	-	-
Salinity	g/l	10,3	2,1	0	0	-	-
EC	µS/cm	18.548	2.100	41,7	37,6	-	-
TSS	mg/l	41	45	6,45	6,57	≤ 30	≤ 50
DO	mg/l	6,47	5,06	26	21	≥4	≥5
TDS	mg/l	9.824	980	32,6	29,9	-	-
BOD5	mg/l	43	10,5	15	9	≤ 6	< 15
COD	mg/l	56	16	21	11	≤ 15	< 30
Cyanide	mg/l	0,009	0,009	0,001	0,002	≤ 0,01	≤ 0,02

Parameter	Unit	Location				QCVN 08: 2008	
		River		Reservoir		Column A2	Column B1
		S1	S2	H1	H2		
Iron	mg/l	0,19	0,13	0,04	0,10	≤ 1	≤ 1,5
Copper	mg/l	0,06	0,67	0,01	0,01	≤ 0,2	≤ 0,5
Manganese	mg/l	0,3	0,1	0,2	0,1	-	-
Zinc	mg/l	0,07	0,01	0,03	0,02	≤ 1	≤ 1,5
Chlorine	mg/l	42,2	41,8	3,9	7,2	≤ 400	≤ 600
Fluoride	mg/l	1,05	0,44	0,01	0,03	≤ 1,5	≤ 1,5
PO_4 (as P)	mg/l	0,28	0,12	0,12	0,21	≤ 0,2	≤ 0,3
Chromium (VI)	mg/l	0,014	0,008	0,008	0,007	≤ 0,02	≤ 0,04
Nitrate (as N)	mg/l	0,5	0,1	0,3	0,1	≤ 5	≤ 10
Nitrite (as N)	mg/l	0,016	0,001	0,003	0,002	≤ 0,02	≤ 0,04
Ammonia (as N)	mg/l	0,06	0,08	0,02	0,03	≤ 0,2	≤ 0,5
Parathion	µg/l	<0,01	<0,01	<0,01	<0,01	≤ 0,2	≤ 0,4
Malathion	µg/l	0,02	0,04	<0,01	<0,01	≤ 0,32	≤ 0,32
Coliform	MPN/100ml	314	637	269	431	≤ 5.000	≤ 7.500

Source: Report on Results of Environmental Monitoring 2011, Quang Binh DONRE

Results show that most of the samples taken in 2005-2009 and in July 2011 comply only with requirements of level B1. At Hai Dang Light House (estuary of Nhat Le river), BOD_5 and COD concentration in July 2011 were above B1 permissible limits with BOD_5 = 43.0 mg/l and COD = 56.0 mg/l exceeding 1.9-2.8 times the permissible level, probably because of the fishing & aquaculture processing wastewater and untreated domestic wastewater from Dong Hoi City.

Salinity of the downstream river reaches is an important issue when considering climate change scenarios which anticipate the reduction of dry season flows as well as the sea level rise. Increased intrusion of sea water into the estuary may have far reaching impacts on the salinity of the river water and on the alluvial aquifer, with potential secondary consequences on urban water supply, irrigation and fish farming. The My Trung sluice is located on Kien Giang river, at a distance of about 25 km from the estuary. This sluice started operation in 1992 to reduce salinity intrusion from the downstream part of Kien Giang river, since high salinity levels were damaging agricultural practice in the area. In the dry season, the salinity at My Trung sluice is about 0.5- 4.2 g/l. Salinity in the lower part of the Nhat Le estuary may reach above 10 g/l.

Two stations have been sampled for coastal water quality: station B1 north of Nhat Le estuary and B2 in Cua Phu (along Bao Ninh Peninsula. Locations are indicated on Figure [19] and results in following Table [11]. Both comply with Column II of QCVN 10:2008 related to coastal activities and bathing.

Table [11] Coastal Water Quality in Dong Hoi (May 2011)

Parameter	Unit	Location		QCVN 10: 2008	
		B1	B2	Column II	Column III
pH	pH unit	7,95	7,95	6,5 - 8,5	6,5 - 8,5
Temperature	°C	30,7	31,8	-	-
TSS	mg/l	37	40	-	-
DO	mg/l	5,97	6,05	-	-
COD	mg/l	10	11	-	-
BOD5	mg/l	6	6	-	
Copper	mg/l	0,19	0,17	≤ 1	≤ 1
Chromium (VI)	mg/l	0,009	0,015	≤ 0,05	≤ 0,05
Zinc	mg/l	0,08	0,04	≤ 2,0	≤ 2,0
Manganese	mg/l	0,2	0,3	≤ 0,1	≤ 0,1
Iron	mg/l	0,05	0,12	≤ 0,3	≤ 0,3

PARAMETER	UNIT	LOCATION		QCVN 10: 2008	
		B1	B2	COLUMN II	COLUMN III
Sulphate	mg/l	0,004	0,006	≤ 0,01	≤ 0,01
Fluoride	mg/l	1,87	1,17	≤ 1,5	≤ 1,5
Cyanide	mg/l	0,009	0,008	≤ 0,01	≤ 0,01
Ammonia (as N)	mg/l	0,04	0,07	≤ 0,5	≤ 0,5
Oil & grease	mg/l	< 0,1	< 0,1	-	-
Coliform	MPN/100ml	198	276	≤ 1000	≤ 1000

Source: Report on Results of Environmental Monitoring 2011, Quang Binh DONRE

4.9. LAND USE

4.9.1. EXISTING SITUATION

Dong Hoi city shows a land use which associates intimately urban, agricultural and natural areas. The distribution of the various land uses is detailed in the following table.

Table [12] LAND USE IN DONG HOI CITY

NO	LAND USE	SITUATION 2010	
		AREA (HA)	%
1	Agriculture, forest and aquaculture land	10,001.3	64.23
1.1	Agricultural land	2,780.69	17.86
1.2	Forest land	6,686.85	42.95
1.3	Aquaculture land	453.44	2.91
1.4	Other agricultural land	80.35	0.52
2	Non - agricultural land	4,883.88	31.37
2.1	Residential	511,55	3.29
	Rural	192.62	
	Urban	318.93	
2.2	Special use	3,244.07	20.83
	Administration	47.93	
	Natinal defence& Security	806.31	
	Trade &Services	503.37	
	Public use land	1,886.46	
2.3	Use for Religious belieft	3.13	0.02
2.4	Tombs & cemetery	213.22	1.37
2.5	Rivers& streams	876.41	5.63
2.6	Other Non - agricultural land	35.5	0.23
3	Unused Land	685.35	4.40
	Total	15,570.6	100

Source: Statistical Yearbook 2011 for Dong Hoi City

This land use table reflects Dong Hoi character still mainly natural with almost 43% of forested land, almost 18% dedicated to agriculture and only 3.29 % of residential land.

4.9.2. DEVELOPMENT TRENDS:

4.9.2.1. QUANG BINH PROVINCE SEDP

On 23 June, 2011 Prime Minister promulgated Decision number 952/QD-TTg on approval of the Social Economic Development Plan (SEDP) of Quang Binh Province to 2020. The general objective of the development plan is to reduce poverty situation from 2015 and become developing province in 2020 with adequate infrastructure system, with developed education and training system to meet the demand of human resources and increase resilience of the Province to natural disasters as floods and typhoons.

Specific objectives of the SEDP include:

- On the economic development side: In period 2011 – 2020, average GDP growth rate will be 12% - 13% per year, of which in 2011 – 2015 the growth rate is 12% and in 2016 – 2020 the rate is 13%. By 2015 GDP per capita objective will be VND 28 – 30 million (USD 1,400 – USD 1,600 equivalent) and by 2020 it will be VND 70 – 72 million (USD 3,500 – 3,700 equivalent). Targeted structure of economy in 2015 will be 43% industry, 40.5% service and 16.5% agriculture; the structure in 2020 will be 44%-45%, 41% and 14%-15% respectively. Exported value will reach USD 155 to USD 165 million in 2015 and USD 260 to 270 in 2020.
- On the social development side: Growth rate of population to be reduced to 1% in 2015 and to 0.9% in 2020, with a reduction of poverty rate of 3.5% to 4% per year for the period 2011-2015 and 3% to 3,5% per year for the period 2016 – 2020. By 2015 the province targets 45% kindergarten, 85% primary school and 50% of secondary schools reaching national standard and by 2020 the targets will be 50%; 100% and 80%-85% respectively. For water supply, by 2015 the province targets 95% of urban area and 75%-80% of rural area using clean water and by 2020 targets are 97% and 90% respectively.
- On the environmental protection side: Forest coverage rate to reach 68.5% in 2015 and 70% in 2020. By 2015, 95% of factories in industrial, service, tourism etc. zones will have collection and treatment systems for solid waste, waste water with a target of 100% by 2020.

4.9.2.2. DONG HOI CITY SEDP

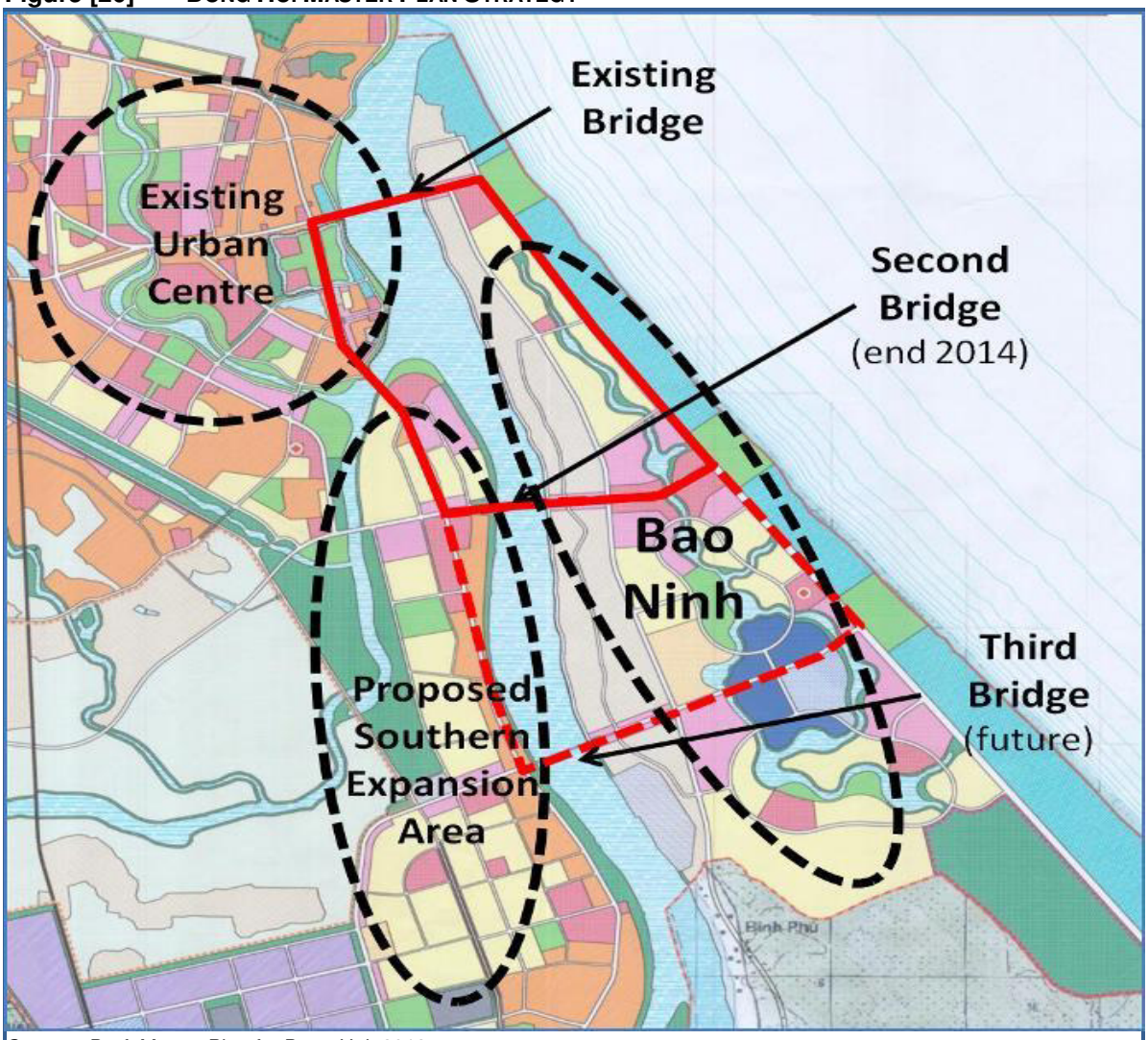
On 22 February 2013, Quang Binh People Committee promulgated Decision number 396/QD-UBND on approval of Social Economic Development Plan (SEDP) of Dong Hoi city to 2020. The general development objectives are (i) to keep a high economic growth rate for the city with a balanced development of all the economic sectors, (ii) to raise Dong Hoi at the level of a Grade 2 city.

- Economic development targets are an average annual growth rate of 13 to 13.5% for the period 2011-2015 and 13.5 to 14% for the period 2016 to 2020.
- The population targets are 120,600 by 2015 and 128,700 by 2020 with a ratio of urban population respectively of 75% and 80%. Poverty rate is targeted to be less than 2% in 2015 and less than 1% in 2020. Annually 6,500 to 7,000 employments will be created with a target of less than 2.5% unemployment by 2020.
- Environmental development targets are to achieve 42.5% of forest coverage by 2015 (and 45% by 2020), 97% of households having access to clean water by 2015 and 99% by 2020, 90% of solid waste and 70% of wastewater collected and treated by 2015 and respectively 95% and 80% by 2020.

4.9.2.3. DONG HOI CITY MASTER PLAN

The Master Plan for Dong Hoi was approved in 2012. It promotes the development (i) northwards towards the airport, (ii) North West from the current urban area, together with an industrial area, (iii) a new southern development area between the Nhat Le and Le Ky rivers and (iv) the development of Bao Ninh peninsula between the Nhat Le river and the sea. Future development strategies are depicted on the following figure.

Figure [20] DONG HOI MASTER PLAN STRATEGY



Source : Draft Master Plan for Dong Hoi, 2012

The provincial government is strongly committed to the development of Bao Ninh as a key part of their strategy to increase the growth of both development and population in Dong Hoi. However, as mentioned above, both Bao Ninh and the Dong Hoi areas need to identify and develop their comparative advantage in respect of other locations which will also be trying to attract additional development. It will not be enough to provide facilities such as hotels and infrastructure: there has to be external demand to either invest in or travel to the area. This requires that Bao Ninh has to be considered as a viable business opportunity by outside developers.

4.10. TERRESTRIAL & AQUATIC ECOLOGY

Vegetal cover is mainly represented in Bao Ninh where it subsists on the coastal dune system. Typical vegetation is representative of sand deposits and of salt resistant species particularly on the seaside of the dunes and along the upper part of the beaches. Several common grasses as *Fimbristylis sp., Eragrostis sp., Chrysopogon sp., Cyperus sp*. are observed in clear stands. *Ipomea pes-caprae*, a pioneer of sand deposits is also observed along the beaches.

The shrub and tree layer, not higher than 5-7 m is mainly represented by *Casuarina equisetifolia* with, occasionally some *Acacia sp*. and *Eucalyptus sp*. All these species have initially been planted but reproduce easily along the littoral.

There is little information about fauna, which is probably typical also of the dune system, with small rodents and birds.

VIEW OF THE COASTAL DUNE IN BAO NINH

COASTAL DUNE BREACH FOR CONSTRUCTION OF FUTURE STORMWATER SYSTEM ON BAO NINH

4.11. PROTECTED NATURAL AREAS

There is no officially recognized nature reserve or protected areas within or in the immediate vicinity of the project area. The closest protected area in Quang Binh Province is Phong Nha-Ke Bang National Park, approximately 50 km North-West of Dong Hoi City.

Phong Nha–Ke Bang National Park is situated in a limestone zone of 2,000 km² in Vietnamese territory and borders another limestone zone of 2,000 km2 of Hin Namno in Laotian territory. The core zone of this national park covers 857 km² and a buffer zone of 1,954 km². The park was created to protect one of the world's two largest karst regions with 300 caves and grottoes and also protects the ecosystem of limestone forest of the Annamite Range region in north central coast of Vietnam. This national park was listed in UNESCO's World Heritage Sites in 2003 for its geological values. In April 2009, the world's largest cave, was discovered by a team of British cave explorers of British Caving Association.

A SCENE INSIDE PHONG NHA CAVE

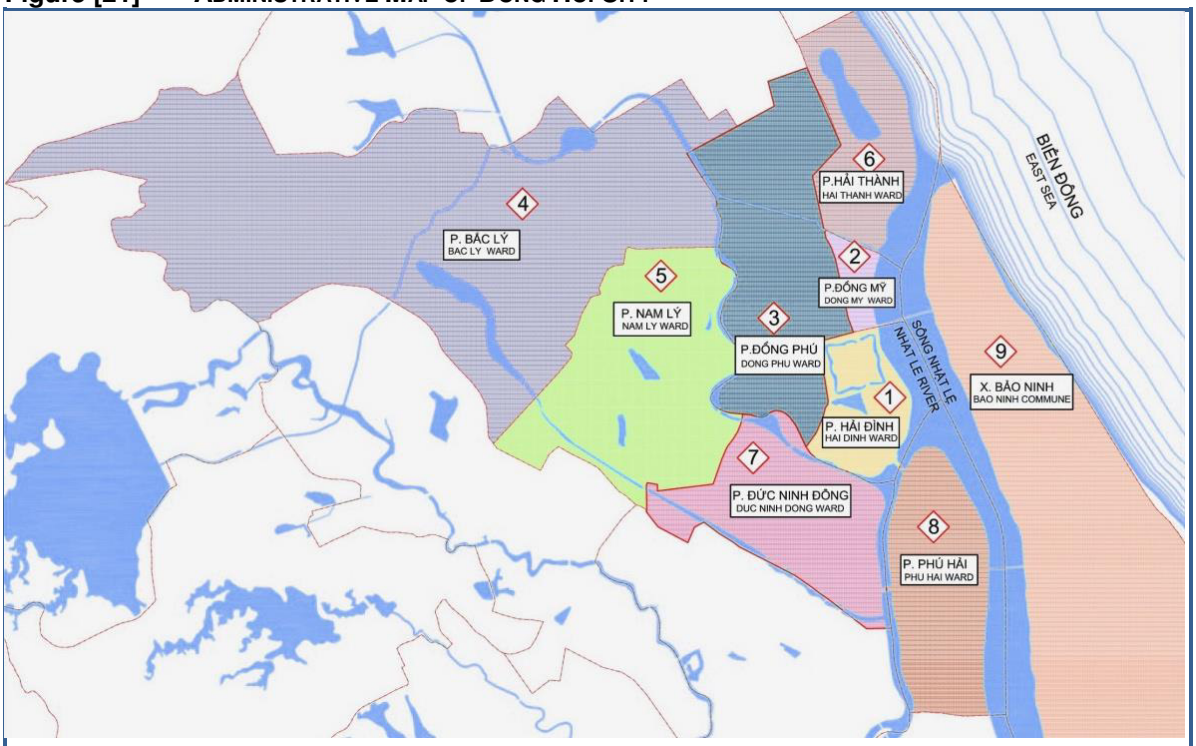
SAOLA, A SPECIES FOUND IN PHONG NHA-KE BANG NATIONAL PARK

4.12. SOCIAL AND CULTURAL BASELINE

4.12.1. ADMINISTRATIVE ORGANIZATION

The project area in Dong Hoi City covers eight wards, namely Phu Hai, Dong My, Hai Dinh, Dong Phu, Nam Ly, Bac Ly, Duc Ninh Dong, Phu Hai and one commune is Bao Ninh. The following map details this spatial organization.

Figure [21] ADMINISTRATIVE MAP OF DONG HOI CITY



Source : Statistical Yearbook Dong Hoi, 2012

4.12.2. POPULATION AND POVERTY

According to Dong Hoi Statistical Yearbook, in 2011 Dong Hoi City had currently 113,722 people with 31,384 households.

Table [13] POPULATION OF DONG HOI CITY BY END OF 2011

No	Ward or Commune	Population			Area (km^2)	Density (persons/km^2)
		Total	Male	Female		
1	Hai Thanh	5,531	2,672	2,679	2.45	2,258
2	Dong Phu	9,816	4,901	4,915	3.81	2,576
3	Bac Ly	17,123	8,549	8,574	10.19	1,680
4	Dong My	2,833	1,415	1,418	0.58	4,884
5	Nam Ly	13,843	6,911	6,932	3.90	3,549
6	Hai Dinh	3,616	1,805	1,811	1.37	2,639
7	Dong Son	8,428	4,208	4,220	19.66	429
8	Phu Hai	3,603	1,799	1,804	3.07	1,174
9	Bac Nghia	7,313	3,651	3,662	7.67	953
10	Duc Ninh Dong	5,024	2,501	2,517	2.77	1,814
11	Quang Phu	3,060	1,528	1,532	3.23	947
12	Loc Ninh	8,316	4,152	4,164	13.41	620
13	Bao Ninh	9,180	4,548	4,560	16.34	562

No	Ward or Commune	Population			Area (km^2)	Density (persons/km^2)
		Total	Male	Female		
14	Nghia Ninh	4,697	2,345	**2,352**	16.33	288
15	Thuan Duc	4,003	1,999	**2,044**	45.36	88
16	Duc Ninh	7,368	3,814	**3,824**	5.57	1,323
	Whole City	113,722	56,803	56,968	155.7	730

Source: Statistical Yearbook 2012 for Dong Hoi City

The distribution of the population is 68% urban and 32% rural in Dong Hoi city. Labor age is accounted from 18 year old to 60 year old. In 2011, the number of the city's labor was 65,958 people (female labor was 32,145 people), of which number of labor working in economic sectors was 42,535 people, number of labor is working in Agricultural sector was 8,096 people, in industrial and construction sector was 16,907 people and service & tourism was 17,532 people (were accounted for 19.0%, 39.8% and 41.2% respectively).

Females make up over half of the entire population of 113,772 in Dong Hoi. In 2011 the incidence of HH poverty was 2.05%, ranging from a high of 4.35% in Nghia Ninh commune to a low of 0% in Hai Dinh and Dong My Wards. Figures provided by the city Department of Labor, Invalids and Social Affairs indicated that 51.8% or 330 HHs were female-headed HHs. In 2012 the incidence of poverty had decreased slightly to 1.72% of all HHs. 59.1% of all poor HHs or 316 HHs were headed by women. The absolute number of poor female-headed households decreased, but the percentage of these HHs in relation to the total poor HHs increased.

4.12.3. Education

In 2011, 43 education establishments were registered, including: 1 University (established in 2005), 5 High Schools (including 4 public schools), 3 Vocational Schools, 1 Technical School, 18 Secondary Schools, 22 Primary Schools and 159 Kindergarten schools. In general, the education facilities available meet the basic requirements. Net enrolment rate at primary level in 2011 was 100%.

4.12.4. Public Health

The population has access to a range of health care facilities, including hospitals, health care stations, nursing centers, etc. In 2012 there were 349 doctors, representing a small increase over the number in 2011, but the number of nurses increased by almost one/third during the same time. The existing health facilities in the project area are summarized in the following table.

Table [14] Health Indicators

	Indicators	2011	2012	2012/2011(%)
I.	Health facilities	30	30	100,0
	Hospitals	3	3	100,0
	Health care base station	16	16	100,0
	Nursing centers and rehabilitation	10	10	100,0
	Epidemic prevention team	1	1	100,0
	Total number of patient beds	881	986	119,2
II	Health care employees			
	Total Health care employees	1017	1116	109,7
	In which: Doctors	343	349	101,7
	Nurse	350	465	132,8
	Another staff	324	302	93,2

Water borne diseases are of particular interest due to their association with negative water quality and exacerbated by climate change impacts, particularly flooding. Following table shows the rates of dysentery, diarrhea and dengue fever for 2011 and 2012.

Table [15] WATERBORNE RELATED DISEASES

DISEASE TYPE	2011	2012	2012/2011(%)	AVERAGE
Dysentery	261	189	72,41	228
Diarrhea	394	672	92,55	497
Dengue	14	10	71,4	66
Total illness	1063	1178	110,8	1734
Rate of illness	0.942%	1.041%	-	1.538%

Source: Prevention Medical Center of Dong Hoi city September, 2013

4.12.5. TRANSPORT, COMMUNICATION & ENERGY

The following infrastructure are available in Dong Hoi:

- The city is served by National Highway 1A, the coastal railway and an international airport.
- Nhat Le Bridge No1, completed and operated since 2004, which connects Bao Ninh peninsular to center area of Dong Hoi City, bridge width is 12 m;
- Nhat Le Bridge No 2 under construction, which connects Phu Hai Ward to Ha Thon village of Bao Ninh peninsular, bridge width is 23.6 m;
- The 36 m width Road which connects Nhat Le Bridge to The Sea Square, road surfaced, a part of sidewalk and median lane are completed;
- The 60 m width Road: 5.2 km of length, starts from the Sea Square to the South ; and branch roads, which connect residential areas to the sea. These roads are under construction;
- Road along Nhat Le river which connects the foot of Nhat Le Bridge No1 to the foot of Nhat Le Bridge No 2 with 23 m of width, which is going construction investment;
- Villages Roads are covered by concrete with 3.0-3.5 m of cross section, 9 km of length.

4.12.6. ECONOMIC PROFILE

4.12.6.1. TOURISM

Dong Hoi is one of tourism places in Central Coast Region of Viet Nam. Dong Hoi has not only nice beach with blue sea and white sand field but also it has several beautiful sites such as Phong Nha Ke Bang natural forest park, which was recognized as a world natural heritage by UNESCO in July 2003; and well-known Phong Nha and Thien Duong caves.

Tourism activity brought significant revenue for Quang Binh province in general, but also for Dong Hoi city in particular. It provides a Gross Output of tourism VND 414,124 million (equivalent USD 20.1 million) plus VND 503,840 million (equivalent USD 24.4 million) revenue of hotel and restaurant in 2011, that means tourist activity contributed directly and indirectly to gross output of Dong Hoi city about USD 44.5 million in 2011.

4.12.6.2. INDUSTRY

Dong Hoi city industry produces processed products (such as processed aquatic products, meat, etc.), garments, ceramic & wooden products, cleaned water; mineral exploitation (peat, ore, rock, sand etc.), which serve for economic development and life of the city and province. Dong Hoi is the industrial production center of Quang Binh province, so most of industrial factories of the province are located in the city. In 2011, revenue of industrial sector was VND 154,086 billion, of which state enterprises were accounted for 44.9% and non-state & foreign enterprises were 55.1%.

4.12.6.3. AGRICULTURE AND FISHERIES

Although Dong Hoi is a city it has rural area with 6 communes producing agricultural, forestry and aquatic products. Agricultural land area of the city is 2,780 hectares, of which 1,771.6 hectares are annual crop land (with 1,229 hectares growing paddy rice), 542 hectares growing upland crops (maize, soybean, peanut etc.), 1,009 growing perennial crops (fruit trees, tea, etc.); Forest land is 6,687 hectares and 453 hectares are raising aquaculture. In 2011, agricultural revenue was VND 214,822 million (USD 10.4 million equivalent), forestry was VND 88,560 million (USD 4.29 million) and aquaculture was VND 337,439 million (USD 16.35 million). Total agricultural, forestry and aquaculture revenue was USD 31 million.

Agricultural products include: crop production such as paddy rice, corn, sweet potato, cassava, peanut, sesame, bean, vegetable etc. fruits (coconut, cashew, etc.) which had revenue in 2011 was USD 4.4 million; animal husbandry such as cattle, buffalo, pig, chicken, duck etc. which 2011 revenue was USD 5.4 million and fisheries products including aquaculture (fish, shrimp, etc.) and fishing (sea food products such as crab, shrimp, cuttle-fish etc.).

4.12.7. ACCESS TO WATER SUPPLY

Water supply is provided by the Quang Binh PWSC to urban residents in Dong Hoi. Coverage is understood to be around 70-80% of Dong Hoi City. There are significant portions of Dong Hoi where poorer communities and other users (such as reportedly the restaurants around the Hai Than lake) where groundwater is the main water resource generally via shallow wells; this is the case for instance for the fishing communities on Bao Ninh.

There are two existing water treatment plants supplying approximately 17,000-18,000 m^3/day: Phu Vinh plant has a capacity of 19,000 m^3/day and Hai Thanh 9,000 m^3/day. Supply from the Hai Thanh plant is, according to the WSC, limited by the resource and effectively reducing water supply capacity to 3,000 m^3/day.

4.12.8. ACCESS TO SANITATION

Existing drainage and sewerage systems are confined to the two urban wards of Hai Dinh and Dong My. The rest of Dong Hoi does not have formal drainage and sewerage systems. The urban areas are usually partially flooded during the rainy season because drainage capacity is limited.

Before 2007, only in the central city area of Hai Dinh ward and Dong My ward (2 wards in the core of the city) rain water and wastewater is collected by a combined system 31 km in length and discharged to the Nhat Le River and Phong Thuy channel adjacent. The drains, in general, are small, degraded, irregularly maintained as well as the channel and flooding occurred frequently. The recent completion of stormwater drains and culverts funded by Phase I of the WB project has begun to improve the situation.

The predominant sanitation system used in Dong Hoi is for grey water to be discharged to the nearest drain or roadside ditch and black water to be discharged to septic tank and then to drain or ditch. In inner city, most households have toilet with septic tanks among them 40-50% have septic tank connection to drains, other 30-40% have soak away holes or trenches inside their home or on the pavements of the road in front of their home, the remaining may have “complete” septic tank (without outlet) or no septic tank at all. 30-50% of households in rural communes use pit latrines or double-vault toilets (with wastes used for gardening and agriculture in some cases), the remaining households using septic tanks. In Bao Ninh area, there is no formal drainage and waste water system.

There is a current ongoing project funded by the WB in Dong Hoi to improve drainage and sewerage systems. This is the Dong Hoi part of the WB Coastal Cities Environmental Sanitation. The two phases of the project have already been briefly presented when introducing the wastewater component of the present project.

4.12.9. SOLID WASTE MANAGEMENT

Waste is collected by QB URENCO, and delivered to the landfill. Visit to the existing landfill indicates that this is rapidly filling (design capacity 110 tons/day for 30 years) and that there is little sorting or recycling undertaken (around 10%). Previous solid waste composition figures undertaken as part of project preparation for the World Bank funded components indicate that there are possibilities for sorting and recycling which could either extend the life of the current landfill or enable its use to be extended to neighboring areas.

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5. IMPACT ANALYSIS

5.1. METHODOLOGY

The impacts were identified by looking at the environmental and social baseline situation of the area confronted to the activities related to each component and stage of the project. For every interrelation between Project activities and each pertinent environmental component, all probable impacts have been identified.

This identification was mainly based on:

- The technical information related to project components design and operation as presented in Chapter 3 of this report;
- Field visits conducted in June 2013 and October 2013 by the Consultant in the Project area;
- The Consultant experience of environmental impacts of a variety of projects including urban development, dredging and road construction;
- The checklists of potential impacts from various types of projects drawn up by international financial organizations (WB, ADB, AfDB).

The result of this analysis is presented in the following sections covering 1) impacts connected with the location of the projected facilities, 2) impacts connected with construction activities and 3) impacts connected with the actual operation of the facilities.

The potential impacts for each of these sections are presented in a summary table, followed by descriptions and analyses of the most probable significant impacts. These tables present, successively, the cause of the impact, the potential impact along with its risk level, the corrective measure along with the ease/difficulty of implementing it and the residual risk level after implementing the measure.

Each summary table shows, for each identified impact, an assessment of the overall risk level, taking three criteria into a consideration: the probability of occurrence of the impact as part of the project, the expected gravity of such an impact given no special corrective measures, and the difficulty of implementing the proposed corrective measures.

- The probability of occurrence reflects how often the impacts are observed during construction and operations: some impacts are inevitable (noise, dust, hydraulic changes downstream) whereas others occur only exceptionally (rockslide, explosion).
- The gravity of an impact incorporates various considerations of intensity of effects on the natural or human environment, its extent and its duration. All necessary efforts must be made to implement corrective and monitoring measures on impacts that are judged to be potentially serious.
- The overall risk relating to an impact, rated from 1 (low) to 3 (high) takes into account the abovementioned criteria.

Table [16] IMPACT ASSESSMENT CRITERIA

CRITERION	LEVEL 1	LEVEL 2	LEVEL 3
Difficulty for implementing corrective measures	Easy, inexpensive and generally effective	Demands special attention (monitoring or training, for example)	Difficult due to complexity or cost
Probability of occurrence of the impact	Low: can be seen in cases of negligence or accident	Medium: generally seen a few times during construction or during the operation of a hydropower facility	High: consistently seen if effective measures are not put in place

CRITERION	LEVEL 1	LEVEL 2	LEVEL 3
Gravity of the impact	Generally limited impact in terms of intensity, duration or extent	Significant environmental impact but without endangering human or animal populations	Major environmental impacts with risks to people or special-status animals
Overall Risk	Low: subject of routine monitoring but impacts are minor and easily manageable	Significant: merits special attention	Major: merits close monitoring and the implementation of effective measures

5.2. ANTICIPATED BENEFITS FROM THE PROJECT

The sub-components of the Urban Environment and Climate Change Adaptation Project selected for Asian Development Bank financing will significantly improve the environmental conditions and quality of life of the population in Dong Hoi through the following results:

- Improvement of the wastewater management for Dong Hoi through complementing the WB on-going project with secondary and tertiary networks; direct benefits are related to (i) improvement of quality of life in the central part of the city, (ii) improvement of public health conditions and (iii) reduction of pollution loads to surface water and underground water.
- Promotion of sustainable urban development for Bao Ninh peninsula in the respect of existing natural resources and natural hazards;
- Promotion of coastal dune system restoration and rehabilitation with direct benefits related (i) to better protection against natural extreme events (typhoon, flooding from the sea) and (ii) to improvement of biodiversity, both vegetal and animal;
- Reduction of anticipated impacts on land acquisition and involuntary resettlement by revising the road development strategy;
- Promotion of sustainable urban drainage strategy (SUDS) based on maximization of drainage water infiltration with direct benefits (i) on reduction of stormwater drainage investment, (ii) reduction of pollution load to the Nhat Le river and (iii) limiting underground penetration of sea water;
- Contribution to long term economic development of Dong Hoi through the development of new urban areas on Bao Ninh taking due consideration of prevailing climate change risks (sea level rise and flooding) and direct effects on the quality of life of future residents and tourists.

5.3. IMPACTS RELATED TO PROJECT LOCATION

5.3.1. IMPACTS ON LAND ACQUISITION AND RESETTLEMENT

Dong Hoi wastewater sub-component will not involve any impacts regarding land acquisition or resettlement. House connection component doesn't involve any land acquisition, the tertiary network being developed along roads and streets. No building demolition is anticipated.

The sewerage component for the commune of Phu Hai involves the implementation of a primary sewer down to the Phu Hai intermediate pumping station and the Terminal pumping station. This consists of about 700 m of diameter 400 mm pipe and 1,900 m of dia. 300 mm pipe, constructed along both sides of National Highway 1. No land acquisition or physical displacement is anticipated.

The wastewater component for Bao Ninh involves the construction of 3 pumping stations, 2 on Bao Ninh and one in Phu Hai. In Phu Hai, no land acquisition is required as the anticipated site is already the property of URENCO and is not used at present. In Bao Ninh, the areas related to the 2 pumping stations are marginal, probably around 20 m² each and the installation may even be fully underground. The two sites are incorporated into the general area required for Bao Ninh urban

development. Their land requirements are included into the requirements for the urban infrastructure development program (roads and associated networks).

The road improvement for Bao Ninh includes 1 North-South road of 3.6 km length and 3 East-West roads of 2.2 km length (refer to Section 3.3.1.2 for details). The PPTA has drastically reduced the social impact as the initial plan considered the widening of small roads crossing the fishing villages and creating major resettlement. The proposed road improvement project will affect largely households through the relocation of graves. Further details are provided in the RP

The Bao Ninh stormwater component of the project will not require additional land than what was required for the roads as the network is developed within the proposed road corridors. For the stormwater drainage based on swales and infiltration facilities along the 60 m road, it is included within the corridor of the road already acquired.

The Bao Ninh Integrated Flood and Coastal Protection will not require land acquisition as the dune restoration and protection is carried out on public land and doesn't alter the existing land use (dune forest).

Several graveyards have been identified within the future urban development zone, most consisting of ancient graves. During public consultation, an agreement was found to relocate the graves in an area already identified and included in the land use planning for Dong Hoi as a graveyard use. There is no land acquisition related to this area, depicted on the following figure, which belongs to CPC.

Figure [22] PROPOSED SITE FOR GRAVEYARDS RELOCATION

Source : PM Group, 2013

5.3.2. IMPACTS ON NATURAL RESOURCES

The project will not encroach on areas of valuable biodiversity. Preparation for new urban development in Bao Ninh, including wastewater and stormwater components and road improvement will affect about 2,000 Casuarina trees growing on the sandy deposits at the back of the coastal dune system. All the land concerned belongs to CPC and compensation for CPC is established at 27,600 VND per tree.

The greening and beautification attached to the project will involve much more than this figure. Additionally, the dune restoration and protection program will also involve re-vegetation of the denuded dune slopes.

The proposed SUDS (Sustainable Urban Drainage System) stormwater drainage will also promote the development of non-surfaced areas, fully vegetated to reduce the imperviousness ratio of the future urban development.

5.3.3. SUMMARY OF IMPACTS AND MITIGATION MEASURES

The following table summarizes the impacts relating to the location of the Dong Hoi Project Components.

Table [17] SUMMARY OF IMPACTS RELATED TO PROJECT LOCATION

COMPONENT OR ACTIVITY	POTENTIAL RISKS	POTENTIAL IMPACT	IMPACT ASSESS-MENT			CORRECTIVE OR SUPPORT MEASURE		OVERALL RISK AFTER CORRECTION
		DESCRIPTION OF IMPACT	PROBABILITY	GRAVITY	OVERALL RISK	DESCRIPTION OF MEASURE	EASINESS OF IMPLEMENTATION	
Dong Hoi wastewater component	Temporary land occupation	Land occupation only temporary and in public land (streets) to lay down pipes and individual connections to sewers. No land acquisition and no building affected	-	-	-	No particular measure to implement except good environmental practices during construction (as described in the next section)	-	-
Phu Hai Wastewater component	Permanent and temporary land occupation	No land acquisition for the pumping station (land belongs to URENCO) No building affected, no physical displacement	3	2	2	No particular measure to implement except good environmental practices during construction (as described in the next section	-	-
		Tree cutting not anticipated	-	-	-	In case few trees cut, replantation trees along the road with a minimum of 1 planted for 1 cut.	-	-
Bao Ninh Wastewater Component	Permanent and temporary land occupation	No building affected, no physical displacement	3	2	2	No particular measure to implement except good environmental practices during construction (as described in the next section	-	-
		Impact on trees (mainly Casuarina)	3	1	1	Minimize tree cutting. Replantation trees along the road with a minimum of 1 planted for 1 cut.	2	1
Bao Ninh road improvement, stormwater drainage & urban development	Permanent and temporary land occupation	16.28 ha of open land, 4.72 ha of clear forest (Casuarina), 1.98 ha of ancient graveyards. No private land acquisition, all land is public and belongs to CPC. No building affected	1	2	1	Transfer of old graves to be organized in coordination with concerned population; relocation site already secured by CPC	1	1
		Clear Casuarina forest growing on sandy soils ane at the back of the coastal dune	3	1	1	Minimize tree cutting. Replantation trees along the road with a minimum of 1 planted for 1 cut.	2	1-
Bao Ninh Coastal Dune restoration	Permanent and temporary land occupation	No land acquisition required, no building affected. Only activities of dune stabilisation and revegetation	-	-	-	Improvement of coastal dune system and biodiversity, protection. No particular measure required	- -	- -

5.4. IMPACTS AND MITIGATION DURING CONSTRUCTION STAGE

5.4.1. UXO ISSUES

5.4.1.1. SOURCE OF IMPACT

Unexploded ordnances may become a public safety issue when development projects involve extensive dredging and earthworks. In the present project, Dong Hoi was one of the cities severely affected by bombing during the war. There is high probability to find UXO during excavation works either in Dong Hoi or in Bao Ninh project areas which may raise a public safety issue for the workers and also the population during works inside or close to residential areas.

5.4.1.2. MITIGATION MEASURE

URENCO shall prepare an Explosive Ordnance Survey and Disposal Plan for the works under its responsibility. The plan shall be prepared and executed by a specialist professional organization (including dedicated professionals of the Vietnamese Army) experienced in work in this area and address the following:

- Identification of all sites involving excavation works (including Cau rao dredging area) and assessment of extent of ordnance survey and disposal to be undertaken in accordance with the Conditions of Contract.
- Detailed procedures for identifying, securing, disposing of unexploded ordnance, implementation of Quality Control procedures and UXO awareness training for the Contractor workers and sub-contractors;
- Submission of reports to the Supervision Engineer and URENCO, related to each Construction Area searched, audited and certified, within 14 days of completion of this work.

Upon reception of the UXO site report, URENCO will issue the official access to land to the Contractor which authorize him to access to the concerned site and start works;

Contractor will be requested to apply the detailed procedures for securing and disposing of UXO in case of finding during works. All workers will receive an induction training at recruitment on safety issues linked to UXO.

5.4.2. DISRUPTION TO COMMUNITY UTILITIES

Utility relocation poses only a short term concern to residents affected by construction activities. Interruptions to power and communication, disruption of water supply, discoloration of water from re-located pipes can be anticipated for Dong Hoi wastewater and individual connections sub-component as the opening of trenches in the street of sidewalks may involve the displacement of water pipe, underground electric cables etc. To minimize impacts, the contractor shall implement the following measures:

1) Water supply pipelines, power supply, communication lines and other utilities shall be re-provisioned before construction works commence
2) Provisions shall be made to preserve the operation of current facilities in sufficient quantity and in agreement with the local community.
3) Re-provisioning shall be undertaken in coordination with the concerned utility company.
4) Affected households and establishments shall be notified at least 3 days in advance of such disruption.

5.4.3. IMPACTS ON AIR QUALITY

5.4.3.1. MAJOR SOURCES OF IMPACT

The main sources of air pollution are machines burning fuel for digging, transportation and loading. Dust and waste gas from these machines affect air quality surrounding work place. Areas most affected are located in a range of around 100 m all around project sites, but also along the main access roads to sites which will be supporting the heavy truck traffic.

The production of dust is generally the most widely perceived nuisance generated by earthworks and transport on non-surfaced roads during dry seasons. Activities related to Cau Rao dredging will involve the removal of significant volumes of sediment which, if temporarily stocked on site may dry up and release suspended particulates under the wind. The risk is however limited to the dry period but could be significant considering the density of population close to the works. The same comment applies for the Dong Hoi wastewater subcomponent which will involve extensive earthworks along urban streets for tertiary connections.

Another source of dust release is the mud collected by the truck wheels within the construction site premises and released on the public road where it dries and generates dust.

Carbon and other harmful pollutants may also be released through the burning of waste on construction sites, including plastics.

5.4.3.2. MITIGATION MEASURES

Best management practices will be adopted during construction to minimize dust and combustion exhaust emissions. Mitigation measures to be implemented by the contractor to minimize impacts on air quality are listed below:

1) Before site works commence, an Air and Dust Control Plan shall be prepared by the contractor and shall be non-objected by the Supervision Engineer (SE). The plan shall provide details of mitigation measures, specific locations and schedules where such measures shall be implemented to minimize impacts to sensitive receptors (residential areas, schools, hospitals, etc.) due to construction works, sourcing and transport of construction materials, and other project-related activities.

2) Reduce pollutant emission at source: Wherever possible, use electrically-powered equipment rather than gas or diesel-powered equipment; Use only vehicles and equipment that are registered and have necessary permits; Construction equipment and vehicles shall be well-maintained and shall meet national TCVN emission standards; Undertake immediate repairs of any malfunctioning construction vehicles and equipment;

3) Burning of wastes generated at the construction sites, work camps and other project-related sites shall be strictly prohibited.

4) Position any stationary emission sources (e.g., portable diesel generators, compressors, etc.) as far as is practical from sensitive receptors;

5) Control the risk of dust release: Keep stockpiles moist and cover vehicles with tarpaulin sheets or other suitable materials to minimize dust emission and prevent spillage of materials (e.g., dredged sediment, cement, stone, sand, aggregates, etc.); Provide temporary covers (e.g., tarpaulins, grass, etc.) on long term materials stockpiles; provide wheel cleaning facility for any truck/car leaving muddy construction site (particularly dredging site of Cau Dao)and accessing to public road; Clean daily road surfaces of debris/spills from construction equipment and vehicles;

6) Ensure availability of water trucks on site and if the works surface and access roads near sensitive receptors (i.e. residential areas, roadside tea and food stalls, schools, hospitals and other sensitive receptors) are dry and dusty, spray water on the exposed surfaces to reduce dust emission.

7) Impose compliance with speed limits on construction vehicles to minimize road dust in areas where sensitive receptors are located.

8) Provide prior notification to the community on schedule of construction activities which may generate some dust and Implement 24 hour community complaints hotline.

5.4.4. IMPACT ON NOISE AND VIBRATION

5.4.4.1. SOURCES OF IMPACT

The works in Dong Hoi for the development of the secondary-tertiary sewers and the individual connections could possibly be the most impacting activities in terms of noise nuisances due to the operation of noisy equipment as pneumatic drills in immediate vicinity with residences located along the streets. Activities related to road improvement in Bao Ninh will also be impacting as some of the roads crosses residential zones.

Along the hauling roads for material and dredged sediment, the average noise will probably be increased because of the increase of truck traffic, but the peak level of noise should not be increased as these roads area already busy with noisy trucks.

The following table provides some typical noise levels measured at various distances from the emission point related to various construction machineries.

At night, construction noise would impose a severe nuisance on the residents in the vicinity, especially those located at less than 50 m. Night working and especially the use of the noisiest equipment during the night should then be strictly controlled in order to minimize the impact of noise on the surrounding residents. In particular for excavations, drills used outside at the beginning of tunnel construction should be forbidden at night.

Table [18] NOISE LEVELS OF VARIOUS CONSTRUCTION EQUIPMENT IN DB(A)

EQUIPMENT TYPE	15 M	30 M	50 M	100 M	200 M
Excavator	78	72	67	61	53
Bulldozer	78	72	67	61	53
Drilling machine	89	83	78	72	66
Air compressor	75	69	64	58	52
Vibrator	76	70	65	59	53
Mixer	75	69	64	58	52
Truck	76	70	65	59	53

Vibration generated during construction and operation has the potential to cause amenity and physical (structural) impacts at receivers. Construction activities anticipated in the Project should not generate significant vibration. The most critical activities will concern (i) probable sheet piling in Cau Dao canal for isolating unit areas for dredging activities, but vibration should disperse quickly in the sedimentary underground and residences are at a reasonable distance from site, and (ii) compaction of roads in Bao Ninh, creating limited vibrations but very close to residential zone.

5.4.4.2. MITIGATION MEASURES

1) Before site works commence, a Noise Control Plan shall be prepared by the contractor and shall be non-objected by the supervision engineer (SE). The plan shall provide details of mitigation measures, specific location and schedule where such measures shall be implemented to minimize impacts to sensitive receptors (residential areas, schools, hospitals, etc.) due to construction works, sourcing and transport of construction materials, and other project-related activities.

2) Restrict noisy construction activities as well as the transport of materials to day time from 6:00 AM to 9:00 PM, and enforce the compliance during night time with Standards QCVN 26:2010/BTNMT (National Technical Regulation on Noise) and QCVN 27:2010/BTNMT (National Technical Regulation on Vibration).

3) Reduce level of noise for surrounding population through a set of measures: Position any stationary equipment that produce high noise levels (e.g., portable diesel generators,

compressors, etc.) as far as is practical from sensitive receptors; whenever possible, completely enclose noisy equipment which can reduce noise level by 15-25 dB(A) and restrict use of noisy equipment (e.g.15 min for every consecutive 30 min period); erect temporary walls around the construction sites, as necessary, especially near sensitive areas such as schools, hospitals, houses, etc. Temporary noise barriers (3-5 meter high) can reduce noise level by 5-10 dB(A); all construction equipment and vehicles shall be well maintained, regularly inspected for noise emissions, and shall be fitted with appropriate noise suppression equipment consistent with applicable national and local regulations;

4) Train truck drivers: minimization of the use of horn, compliance with speed limitation particularly in residential zones.

5) Provide prior notification to the community on schedule of noisy construction activities and implement 24 hour community complaint hotline.

5.4.5. OFF-SITE PUBLIC SAFETY AND INCONVENIENCE

5.4.5.1. SOURCE OF IMPACTS

Activities for wastewater networks in Dong Hoi and for road improvement in Bao Ninh will definitely reduce the accessibility to certain streets, reduce the number of usable lanes and create traffic congestion. The presence of population including children next to construction activities where heavy machinery is operating and with the presence of excavations and construction equipment creates additional risks of accident for the public.

Also, the working area may temporary alienate access to work sites, schools and community facilities. In addition, retail merchants will suffer economic losses if access id denied to their establishments.

The project will be required to take all the necessary measures in order to minimize the detrimental side effects of construction activities particularly regarding traffic and public safety.

5.4.5.2. MITIGATION MEASURES

The following measures shall be implemented by the contractor to address impacts to traffic flow and access to properties:

1) Before site works commence, a Traffic Management Plan for the construction phase shall be prepared by the concerned contractors and shall be non-objected by the SE. The plan shall be designed to ensure that traffic congestion due to construction activities and movement of construction vehicles, haulage trucks, and equipment is minimized. The plan shall be prepared in consultation with local traffic police and discussed with people's committees at the district and commune levels. The plan shall identify traffic diversion and management, define routes for construction traffic from materials storage/parking areas to construction site and from construction site to waste disposal locations, traffic schedules, traffic arrangements showing all detours/lane diversions, modifications to signaling at intersections, necessary barricades, warning/advisory signs, road signs, lighting, and other provisions to ensure that adequate and safe access is provided to motorists in the affected areas.

2) Provide signs advising road users that construction is in progress and that the road narrows to one lane using cones.

3) Employ flag persons to control traffic at sites for safety reasons when construction equipment is entering or leaving the work area.

4) Lanes through the work site created by rope or flagging, shall be developed to minimize risks and injuries from falling objects.

5) Post traffic advisory signs (to minimize traffic build-up) in coordination with local authorities

6) Provide road signs indicating the lane is closed 500 m before the worksite and signs to indicate the proposed detour road.

7) Provide sufficient lighting at night within and in the vicinity of construction sites.

8) Regularly monitor traffic conditions along access roads to ensure that project vehicles are not causing congestion.

9) As much as possible, schedule delivery of construction materials and equipment as well as transport of spoils during non-peak hours.

10) Implement suitable safety measures to minimize risk of adverse interactions between construction works and traffic flows through provision of temporary signals or flag controls, adequate lighting, fencing, signage and road diversions.

11) Comply with traffic regulations and avoid, where possible, roads with the highest traffic volumes, high density of sensitive receivers or capacity constraints are not used as access to and from the construction areas and spoils disposal sites.

12) Install temporary accesses to properties affected by disruption to their permanent accesses.

13) Reinstate good quality permanent accesses following completion of construction.

5.4.6. IMPACTS FROM WASTE PRODUCTION

5.4.6.1. SOURCE OF IMPACTS

Quantities of solid waste will be generated by construction activities or by worker camps and canteens. Pollution risks are high if this waste is not managed appropriately, with secondary impacts on water and air quality, and the risk of developing disease vectors (mosquitoes, flies, rats) harmful to public health. A plan for managing all these types of waste must be put in place to avoid cross-contamination.

There are three categories of waste to consider: household waste, inert construction waste and hazardous waste.

The quantity of domestic waste, mainly produced by temporary or permanent camps set up for the needs of the project, can be estimated at 0.5 to 0.7 kg/person/day. This waste mainly includes waste from canteens, packaging, plastic bottles, glass bottles, paper and cardboard. As we are located in an urban area which may supply most of the manpower required, it is not anticipated large worker camps, but small camps on the sites to ensure a presence 24h and the protection of the equipment. Production of waste will be rather limited nevertheless it is worth being properly managed.

Inert construction waste is generated on the construction sites in variable quantities. It consists mainly of wood, packing boxes, scrap, plastics and concrete debris (the later coming from the few buildings to be demolished). This waste is generally disposed of, and landfilled in appropriated sites or in permanent inert materials sites where spoil from excavation is disposed. They represent no direct danger to health. Scrap metal is generally collected for recycling. Wood and cardboard waste if burnt will produce fumes and nuisance for the neighborhood.

Hazardous waste such as vehicle batteries, oil filters, various containers that had held hazardous products (mainly paints and solvents) and other alkaline/lithium ion batteries is generated by construction activities, but in specific places and in limited quantities. This waste is very harmful to the environment and public health and must receive appropriate treatment so as to ensure it is eliminated safely. The main risk comes from used engine and hydraulic oil resulting from the maintenance on site of heavy equipment (backhoe, bulldozer, levelers, etc.) and which may be produced in large quantities. If released on the ground, these hydrocarbons will involve surface and underground water pollution. Maintenance of trucks on site is not anticipated, as the project is developed in an urban area where garage facilities are available for trucks. Hazardous waste also includes sludge from temporary toilets and from chemical toilets to be installed on construction sites within urbanized areas.

5.4.6.2. MITIGATION MEASURES

To avoid such impacts, the contractor shall be requested the following:

Prior to the start of the works, to prepare a Waste Management Plan addressing the management issues related to all types of waste: anticipated production and schedule, collection system proposed, disposal methods and location. The Plan will reflect the following obligations:

For Non-hazardous Waste

1) Provide garbage bins and facilities within the project sites for temporary storage of construction waste and domestic solid waste and ensure that wastes are not haphazardly dumped within the project site and adjacent areas.

2) Implement an employee awareness program in waste management and site cleanliness.

3) Organize with Dong Hoi Municipal Services the regular collection of domestic waste in the project sites.

4) Identify recognized regional recycling companies to collect recyclable waste on a regular basis. Set up a storage center where the material is unloaded under supervision; the temporary storage facility will be implemented in an area at least 100 m from a residential boundary, with weatherproof flooring and roofing, security fencing and access control and drainage/wastewater collection system.

For Hazardous Waste

1) Sludge from septic tanks or chemical toilets temporary implemented on construction sites will be removed by a registered company and transferred to the existing disposal site used by URENCO in Dong Hoi.

2) Waste engine oil and hydraulic lubricants from the maintenance of heavy machinery and the floating oily residue from oil separators will be collected and stored in tightly sealed containers to avoid contamination of soil and water resources. Transport and off-site disposal of such wastes shall be consistent with national and local regulations

3) Containers will be stored in a dry and covered area, the waterproof floor surrounded by a bund the height of which will ensure retention of a volume equal to at least 110% of that of the largest container stored in the area, and equipped with an oil separation system at its outlet, all above flood level.

4) The Contractor will identify an acceptable recycling point (refinery) or an industrial facility where the waste can be burned (as fuel substitute in a plant such as a cement factory or metal foundry). A register will be maintained to record all handling of used lubricants, for the purpose of monitoring wastes.

5) Used chemical substances: the principal action to limit the management of used chemical substances is to use ones with low toxicity values and use the minimum quantity of chemical substances required. Used chemical substances will be stored in containers or drums in the same storage areas as used oils, as long as these substances are compatible. Otherwise, they will be stored in a safe area protected from inclement weather. The possibility of reuse in situ will be evaluated; failing this, the materials will be returned to the supplier or to appropriate waste treatment installations.

6) Supplies: batteries, vehicle batteries, oil filters, printer cartridges from the site will be sorted and deposited in separate containers. The contractor will identify a circuit for elimination of these products and will submit his choice to the Supervision Engineer for non-objection.

7) Medical wastes from the First Aid stations on site will be placed in appropriate, secure containers and regularly delivered to the Dong Hoi Hospital equipped with an incinerator.

8) Metal or plastic containers that have contained hazardous or toxic chemical substances will be collected by a registered company for treatment and recycling.

5.4.7. HAZARDOUS MATERIAL MANAGEMENT AND ACCIDENTAL SPILL

According to the type of construction activities anticipated for the Dong Hoi components, it is not anticipated significant storage of hazardous products on sites, except some storage of fuel for refill of the heavy equipment and engine/hydraulic oil for maintenance. This should mainly happen in

Bao Ninh and on Cau Rao site. In case of accidental spillage, the risk of water pollution is significant, as well as the risk of fire if dealing with diesel. These impacts will be addressed through implementation of the following measures by the contractors:

1) Before site works commence, a Spill Response and Management Plan shall be prepared by the contractor and shall be non-objected by the supervision engieneer. The plan shall provide details of procedures, responsibilities, resources, documentation and reporting requirements, training provisions for relevant staff, etc. to avoid spills of hazardous substances (either new or waste) and to effectively respond quickly and efficiently to such incidents, in case these occur.

2) Store fuel and hazardous substances in dedicated areas similarly equipped than those presented for hazardous waste (see above). If spills or leaks do occur, undertake immediate clean up.

3) Ensure availability of spill clean-up materials (e.g., absorbent pads, fine sand, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored.

4) Train relevant construction personnel in handling of fuels and spill control procedures.

5) Ensure all storage containers are in good condition with proper labeling, regularly check containers for leakage and undertake necessary repair or replacement.

6) Store hazardous materials above flood level.

7) Equipment maintenance areas shall be provided with drainage leading to an oil-water separator that will be regularly skimmed of oil and maintained to ensure efficiency. Discharge of oil contaminated water shall be prohibited.

5.4.8. IMPACTS ON WATER RESOURCES QUALITY AND USE

5.4.8.1. SOURCES OF IMPACT

Activities related to Cau Rao channel dredging may, if not appropriately managed, alter the quality of the surface water flowing directly into the Nhat Le river. The main risks include:

Increase of the suspended sediment in the Nhat Le river: Dredging activities will definitely increase locally the suspended sediment in the Cau Rao and subsequently in the Nhat Le depending on the discharge in the Cau Rao. Risk seems limited as the channel flow follows the tide and it is anticipated that most of the re-suspended sediment will deposit again in the channel. Furthermore, the channel is brackish and salinity favors faster sedimentation of fine particles.

Pollution impact from hazardous material/waste accidental spill or leakages: the risk concerns mainly the Cau Rao dredging site as it is the only site next to a surface water stream. Any similar accident in the other sites will mainly affect locally the soil.

Pollution by wastewater and solid waste from construction facilities: This may happen if effective environmental control of the sites is not provided by the Contractor. Also, pollution of water resources may result from the discharge of water from the washing of heavy equipment (hydrocarbon pollution) or from the concrete trucks (alkaline pollution).

5.4.8.2. MITIGATION MEASURES

The contractor will be required to prepare a Water Resource Management Plan to detail measures for the protection of water usage and water quality during the construction period. These measures and contractor obligations will concern:

1) The organization of dredging/excavation operations in Cau Rao in order to isolate working areas from the rest of the channel using sheet piles or appropriate contention of dredging place, to contain within a limited area the unavoidable increase of suspended sediment;

2) All the water pumped during the dredging activity or from excavation works and which will have high suspended sediment content will be discharged in a sedimentation facility prior being returned to the surface water body or in a drainage network;

3) All activities or camp sites located next to a surface water body or in the middle of residential areas will be provided with sanitation systems (mobile toilets or temporary septic tanks), solid waste collection facilities and dedicated storage areas for hazardous material or waste (fuel, oils) all above flooding level.

4) Implement a dedicated area for equipment cleaning/daily maintenance, involving full waterproof floor, peripheral drainage ending in a sedimentation pond followed by an oil-water separator. If concrete trucks are washed on site, water in the pond will be buffered to neutrality by acid before being returned to the environment.

5) Implement a procedure for spill/leakage control during refueling of heavy equipment on site.

5.4.9. IMPACTS ON CULTURAL AND HERITAGE RESOURCES

5.4.9.1. SOURCES OF IMPACTS

With the exception of the graveyards in Bao Ninh, no other identified sites of heritage significance will require removal or demolition as part of the construction works and there will be no land acquisition of any heritage sites. However, even if no valuable physical cultural resource has been identified from the project areas, impacts on archaeological relicts may happen particularly during excavations on Bao Ninh.

5.4.9.2. MITIGATION MEASURES

The following 'chance to find' procedure will be implemented by the contractor throughout the construction works to account for any undiscovered items identified during construction works:

1) Workers will be trained in the location of heritage zones within the construction area and in the identification of potential items of heritage significance;

2) Should any potential items be located, the site supervisor will be immediately contacted and work will be temporarily stopped in that area;

3) If the site supervisor determines that the item is of potential significance, an officer from the Department of Culture and Information (DCI) will be invited to inspect the site and work will be stopped until DCI has responded to this invitation;

4) Work will not resume in this location until agreement has been reached between DCI and URENCO regarding selection and implementation of any required mitigation measures, which may include excavation and recovery of the item;

5) A precautionary approach will be adopted in the application of this procedure.

5.4.10. HEALTH AND SAFETY OF WORKERS

The project will concentrate a number of workers which are mainly expected from Dong Hoi and surrounding areas. It is probable that only a limited number of workers is recruited outside the region and will live in camps. To ensure appropriate health and safety conditions for the workers, a Health and Safety Management Plan shall be prepared by the concerned contractors and shall be non-objected by the SE. The plan shall be designed to ensure that Vietnamese labor regulations as well as international good practices related to health and safety are efficiently implemented on site and shall comply with the following obligations:

1) The Plan shall address health and safety hazards associated with construction activities (e.g., working at heights, excavations, etc.) establishment and operation of construction/worker's camps, use of heavy equipment, transport of materials and other hazards associated with various construction activities.

2) Appoint an Environment, Health and Safety manager to look after implementation of required environmental mitigation measures, and to ensure that health and safety precautions are strictly implemented for the protection of workers and the general public in the vicinity of construction areas

3) Conduct awareness training for construction workers regarding health and safety measures, emergency response in case of accidents, fire, etc., and prevention of HIV/AIDS and other related diseases.

4) Provide first aid facilities that are readily accessible by workers.

5) Provide fire-fighting equipment at the work areas and at construction camps, as appropriate.

6) Provide adequate drainage in workers camps to prevent water logging/accumulation of stagnant water and formation of breeding sites for mosquitoes.

7) Provide adequate housing for workers.

8) Provide reliable supply of potable water for workers.

9) Provide separate hygienic sanitation facilities/toilets and bathing areas with sufficient water supply for male and female workers.

10) Establish clean canteen/rest area.

11) Ensure proper collection and disposal of solid wastes within the construction camps consistent with local regulations.

12) Provide fencing on all areas of excavation greater than 2 m deep.

13) Provide appropriate personnel protection equipment (PPE) such as safety boots, helmets, gloves, protective clothes, goggles, ear protection and ensure the equipment is effectively used.

14) Ensure reversing signals are installed on all construction vehicles.

15) Implement precautions to ensure that objects (e.g., equipment, tool, debris, etc.) do not fall onto or hit construction workers.

16) Implement fall prevention and protection measures whenever a worker is exposed to the hazard of falling more than two meters, falling into operating machinery or through an opening in a work surface. Based on a case-specific basis, fall prevention/protection measures may include installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area, proper use of ladders and scaffolds by trained employees, use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard, fall protection devices such as full body harnesses, etc.

5.4.11. SUMMARY OF IMPACTS AND PROPOSED MEASURES

The table below summarizes the impacts identified and the corrective measures proposed for the Dong Hoi Project Components during the construction period. For the meaning given to the evaluation of the impact, see Section 5.1: Methodology for Impact Assessment.

Table [19] SUMMARY OF IMPACTS AND MITIGATION MEASURES DURING CONSTRUCTION

COMPONENT OR ACTIVITY	POTENTIAL RISKS	DESCRIPTION OF POTENTIAL IMPACT	IMPACT ASSESSMENT			CORRECTIVE OR SUPPORT MEASURE		
			PROBABILITY	GRAVITY	OVERALL RISK	DESCRIPTION OF MEASURE	EASINESS OF IMPLEMENTATION	OVERALL RISK AFTER CORRECTION
Land preparation	Excessive destruction of trees	Impact limited to Dong Hoi wastewater component where few street trees may have to be cut, and to the Bao Ninh urban development area which will involve the cutting of Casuarina trees	3	1	1	Monitoring of tree cutting by SE, and maximization of conservation	2	1
						Greening program considering at least 1 tree planted for 1 tree cut	1	1
	Interference with compensation & resettlement	Construction works start while land acquisition is not completed, raising conflicts with concerned population	1	3	2	Procedure with issuance of a land acquisition certificate as a prerequisite for authorizing contractor to access the land.	2	1
						Monitoring by SE-DES of land acquisition progress and of issuance certificate		
Workers' camps	Pollution of surface water and groundwater	Wastewater discharged into the external environment without treatment	3	2	2	Wastewater receives treatment before being released outside premises (septic tanks/drains)	3	1
						Contractor to monitor the quality of effluents released outside the bounds of the camps	1	1
	Zones of stagnant water	Proliferation of water-borne disease vectors (mainly dengue fever and malaria)	2	3	2	Create and maintain ditches to ensure efficient drainage and drain all stagnant water zones in camp	2	1
						Regular treatment of living areas with approved pesticides	1	1
	Health risks	Development of diseases linked to deficit in hygiene	2	2	2	Systematic awareness sessions for all new arrivals at the camp: meetings, posters in circulation areas, monitored by the camp chief	1	1
		Risk of epidemics in the camps	2	2	2	Prevention by automatic medical check-up at hiring	1	1
						Monitoring of hygiene conditions at the camps	2	1
						Anti-malarial prophylaxis, including mosquito netting	1	1
						Communication with the surrounding populations and local authorities.	2	1
	Workers' living conditions	The most serious impact would be that the contractor does not provide acceptable housing facilities and subsistence to the workers.	2	3	3	Include detailed specifications for equipment and management of camps in the tender documents.	1	1

Component or activity	Potential risks	Description of Potential Impact	Impact assessment			Corrective or support measure		Overall Risk after Correction
			Probability	Gravity	Overall Risk	Description of Measure	Easiness of Implementation	
Water supplied in workers' camps	Non-potable water supplied.	Impact on public health, risk of epidemics. Risk is limited as the project components are located within or next to urban areas, camps will be limited in number and size and easily connected to Dong Hoi water supply network	1	3	2	Supply packaged water (bottles, 20 litre tubs) for the small camps on sites (with few peoples sleeping on site)	1	1
						Contractor to regularly monitor coliforms	2	1
Workshops and garages	Water and soil pollution	Stormwater drainage contaminated by pollutants flowing to the Nhat Le river. Impact concerns all components of the project but a more sensitive issue for Cau Rao working in an aquatic environment	3	2	2	Drains of working facilities equipped with oil separators	2	1
						Properly store hazardous products (including hydrocarbons). See activity "Use and storage of hazardous products"	1	1
						Monitor and control used oil: Monitoring registers/logs and dedicated storage areas.	1	1
Dredging	Water pollution	Impact limited to Cau Rao channel. Suspended sediment is released in the water increasing turbidity	3	2	2	Operating methods to be detailed in advance in the Dredging and Sediment Management Plan, highlighting method to confine suspended sediment to the smallest volume of water Monitoring of activities by SE-DES	2	1
	Water resources	Dredging activities will have no impact on water resources availability	-	-	-	No specific measure required	-	-
	Loss of cultural resources	Low risk in this WR. However, the possibility exists of archaeological physical resource discovery during excavation work with the total loss of the relic if special measures are not taken.	1	2	2	Implement a Chance to Find procedure aimed at halting work and warning the supervisors and the national authorities concerned so measures can be taken to preserve the discovery and restart work as quickly as possible. Personnel to be aware of the procedure.	1	1
	Risk of explosion	Potential public safety risk if an UXO is discovered during dredging of Cau rao	2	3	3	UXO clearing of all construction sites prior to start earthworks; procedure in place in case of finding during works	2	1
Hazardous waste management	Water and soil pollution	Located in urban area, most truck maintenance will be done in private garages. Only heavy machinery may receive basic maintenance and refueling on site. Limited volumes of used engine oil and used hydraulic oil will be produced on site and will need appropriate storage to avoid soil and water pollution	3	2	2	Require the contractor to prepare a Hazardous Waste Management Plan	1	1
						Use storage sites that meet safety standards	1	1
						Identify the existing used oil recycling centres in the Province	1	1
						Contractor to maintain a log of production/recycling of used oil	1	1

Component or activity	Potential risks	Description of Potential Impact	Impact assessment			Corrective or support measure		Overall Risk after Correction
			Probability	Gravity	Overall Risk	Description of Measure	Easiness of Implementation	
Concrete production	Public health	Impact on the health of personnel handling cement	2	3	2	Supply personal protective equipment to the workers and check that it is used. Favor concrete from existing industrial plant	1	1
	Water pollution	Water pollution by the alcaline wastewater from equipment and trucks cleaning operation (particularly the cleaning of concrete trucks)	3	2	2	Require the contractors concerned to install sedimentation ponds with pH adjustment	2	2
						Contractor to monitor the quality of effluent released	1	1
Production of solid non-hazardous waste	Water and soil pollution	Pollution by domestic waste: Possible impact if waste is not managed according to best practices in worker camps and construction sites Only small camps anticipated which limits the potential magnitude of the impact.	3	2	2	Contractor to submit a Solid Waste Management Plan including methods and procedures for (i) awareness training of residents, (ii) collection and storage of waste on project sites, (iii) selective collection and recycling of waste (iv) eventual collection and disposal of waste, (v) identification of service companies	1	1
		By construction waste: Limited risk for inert products but high visual impact	2	1	2	Identify suitable landfill sites, if possible associated with sediment disposal site for products such as concrete and plaster	1	1
						Encourage reuse and recycling especially of metals, plastics and glass	2	1
Earthworks	Risk of explosion	Potential public safety risk if an UXO is discovered during earthworks particularly in Bao Ninh	2	3	3	UXO clearing of all construction sites prior to start earthworks; procedure in place in case of finding during works	2	1
Sediment and Spoil Disposal	Landuse	No land acquisition anticipated as disposal area already under development.	1	2	2	Optimize re-use of sediment in the vicinity of Cau Rao to minimize transportation of sediment	2	1
		Temporary disposal of sediment before it is used or transported to disposal site may impact land use	2	2	2	Contractor to detail sediment management in the Dredging and Sediment Management Plan including temporary disposal methods and sites	1	1
	Water pollution	Erosion of the deposit and sedimentation in the natural drainage or in low lying areas	2	2	2	Good practices for erosion and sedimentation control to be detailed and implemented by contractor	2	2-1
	Public safety	Unstable excavations and slopes of spoil disposal may present risk of landslide	1	2	2	Respect geotechnical best practices (compacting of material, slopes). Choose sites far from sensitive structures and camps	1	1
Road Traffic	Public safety	Potential risk of road accidents related to increased traffic of trucks in urban areas and restriction on traffic imposed by works on roads in Bao Ninh and on sewerage in Dong Hoi	2	3	2	Selected hauling routes and preventive/monitoring measures to be presented by the contractor in the Road Traffic and Access Plan	1	1
						Monitoring of driver behaviors in relation with police department	1	1

Component or activity	Potential risks	Description of Potential Impact	Impact assessment			Corrective or support measure		Overall Risk after Correction
			Probability	Gravity	Overall Risk	Description of Measure	Easiness of Implementation	
Road Traffic (Cont)	Risk of traffic disruption in urban zones	Most significant impact anticipated for Bao Ninh roads and Dong Hoi wastewater components	3	2	3	Road Traffic and Access Management Plan to detail procedures for traffic management: coordination with police, public information, signs and safety etc.	2	1
	Air pollution	Excessive exhaust gas emissions	3	2	2	Keep engines serviced	2	1
		Production of dust	3	2	2	Speed control, regular sprinkling of sensitive urban areas and on construction sites	2	1
Handling of hazardous products	Fire risk	Related to the storage of flammable products: hydrocarbons, paints, solvents. Potential risk on most sites involving heavy machinery	1	3	2	Provide fire equipment at each storage site (extinguishers, fine sand) and safety posters displayed onsite.	1	1
						Set up a safety procedure and awareness/training for personnel concerned.	1	1
	Risk of accidents for the personnel	Burning during handling operations, but risks reasonnably limited	1	3	2	Provide training for personnel plus personal protective equipment and onsite safety data sheets for the products concerned	1	1
	Water pollution	Potential risk of accidental spillage: Leak in a storage tank, accidental spillage when handling or refuelling engines, road accident when transporting hydrocarbons.	2	3	2	Contractor to prepare hazardous products management plan, in particular: Store using containment trays, measures for preventing and detecting leaks and accidental spills, register/log of hazardous products and their use, antipollution equipment.	2	1
						Emergency response procedure in the case of accidental spillage	2	1
						Special safety measures for refuelling engines onsite	1	1

5.5. IMPACTS DURING OPERATION STAGE

5.5.1. IMPACTS ON FLOODS

The project will contribute to improve the general situation of Dong Hoi regarding flooding through:

- The dredging of Cau Rao channel will increase its drainage capacity during heavy rains. It will mainly improve storm water drainage from urbanized areas and reduce related localized flooding.
- The roads improvement and urban development in Bao Ninh will integrate appropriate criteria of climate change, particularly related to sea level rise, to eventually reduce the flood occurrence of these areas.

Improvement of roads in already urbanized areas may sometimes create additional localized flooding if road drainage is not appropriate. This risk is applicable to the riverside road in Bao Ninh, connecting Nhat Le 1 bridge to future Nhat Le 2 bridge under construction. The presence of houses all along this road increases the possibility such impact occurs locally. This aspect will be closely monitored after the completion of the works and concerned population will be informed of the procedures for the Grievance Redress Mechanism.

5.5.2. IMPACT ON PUBLIC SAFETY

The early warning system proposed as a component of this project will have obviously very beneficial impacts on public safety and on the local economy: Early information on flood threat allows the concerned authorities to optimize the watershed reservoirs management

5.5.3. IMPACTS RELATED TO WATER QUALITY

The main impact on water quality from the project results from the development of individual connections which will increase the fraction of wastewater delivered to the Duc Ninh WWTP and thus not more discharged directly into the river. Considering the project will finance the connection of 8,138 households, each discharging 750 l wastewater per day, the total abatement of pollution load to the Le Ky and Nhat Le rivers is summarized in the following table.

Table [20] POLLUTION LOAD REDUCTION

SUB-PROJECT-RIVER	BOD5	TOTAL-N	TOTAL-P
Load before (tons/year)	891.1	207.9	59.4
Load after (tons/year)	55.7	33.4	29.7
Load reduction (tons/year)	835.4	174.5	29.7

The individual connections implemented in Dong Hoi will reduce earlier by around 800 tons/year BOD_5 presently discharged in the environment including underground water and drainage to the Nhat Le river, an evident direct benefit from the project. The EIA carried out in 2010 provides an analysis of the pollutant load carrying capacity of the Le Ky river which confirms the river can accept the pollution load represented by the discharge of treated effluent over the limited distance before its confluence with the Nhat Le river.

The domestic connections to the sewerage network will progressively reduce the pollution load released from septic tanks or pit latrines to the superficial aquifer and help restoring its quality.

During floods, there is an increase of public health issues (particularly diarrhea) because of the pollution released by all the flooded septic tanks in the water. With a sewerage network, the risk will be reduced.

5.5.4. IMPACTS ON WATER USE

The project will not have any detrimental on irrigation or on other water uses. The stormwater drainage method proposed by the PPTA team on Bao Ninh, promoting re-infiltration of water rather than discharging in the Nhat Le as initially considered. This will increase the freshwater supply to the coastal aquifer, subsequently improve the control on saltwater intrusion and provide a sustainable protection of the resource for agriculture use (vegetable irrigation, fish farming).

5.5.5. IMPACTS ON AIR QUALITY

The improvement of the road system in Bao Ninh is anticipated to have 2 main impacts: (i) reduction of dust because of the improvement of the road surface, (ii) increase of air pollution (gas exhaust) and noise because of potential traffic increase mainly after the commissioning of Nath Le 2 bridge.

It is proposed to monitor the air quality during the first year after project construction completion.

5.5.6. IMPACTS ON FISHERIES

None of the project component will have impact on sea or estuary open fisheries. The Bao Ninh development will not affect fishpond, and will not restrict access to river or seashore for fishermen.

5.5.7. IMPACTS FROM DUNE RESTORATION PROGRAM

The dune stabilization, revegetation and protection will favor the development of vegetation which will attract, through diversification and extension of habitats, more wildlife, particularly birds. The vegetation will also stabilize the sand and reduce wind erosion. This will subsequently reduce the maintenance on the 60 m road regarding removal of sand blown on the road and in the drains.

On the sea side, the dune will offer a better resistance to storms and ensure the sustainable hydrodynamic situation between the offshore conditions, the beach and the dune.

5.5.8. SUMMARY OF IMPACTS AND PROPOSED MEASURES

The impacts discussed in this Section and the proposed corrective measures are summarized in the following table.

Table [21] SUMMARY OF IMPACTS RELATED TO PROJECT OPERATION

COMPONENT OR ACTIVITY	POTENTIAL EFFECT	POTENTIAL IMPACT	IMPACT ASSESSMENT			CORRECTIVE OR SUPPORT MEASURE		OVERALL RISK AFTER CORRECTION
		DESCRIPTION OF IMPACT	PROBABILITY	GRAVITY	OVERALL RISK	DESCRIPTION OF MEASURE	EASINESS OF IMPLEMENTATION	
Wastewater in Dong Hoi	Impact on water quality	The project will fasten the connection of about 8,000 households, reducing the present pollution load delivered to the aquifer and to the Nhat Le	-	-	-	NA		
Cau Rao Channel	Impact on urban flooding	After dredging Cau Rao will improve the drainage of a significant part of Dong Hoi city during storm events.	-	-	-	NA	-	-
Bao Ninh and Phu Hai wastewater	Impact on water quality	The project will fasten the connection of about 13,000 households, reducing the present pollution load delivered to the aquifer (used in Bao Ninh) and to the Nhat Le	-	-	-	NA		
Road improvement in Bao Ninh	Impacts on flood resilience	The project components will not have direct impact on flood, but will improve the resilience of the residential areas (existing or coming) against flood.	-	-	-	No measure required	-	-
	Impact on local flooding	The riverside road to be upgraded crosses the fishermen village. Road side drainage may, if not adequate, create local flooding or stagnant water next to houses	1	2	2	Follow-up by Department of Transport and information on the Grievance Redress Mechanism provided to the population by PMU-CES by the end of construction of the road.	1	1
	Impact on air quality	Improvement of Bao Ninh road network may favor increase of traffic with subsequent increase of air pollution for the residents when Nhat Le 2 bridge is completed	1	2	2	Montoring of air quality during first year of operation of the road (year 5 of the Project) under the SE-DES	1	1
Coastal Dune restoration and protection	Vegetation cover development	Increased dune system resistance to wind erosion and coastal erosion	-	-	-	Ensure the protected zone and vegetation cover is efficiently protected against building encroachment through strict land use regulations	-	-
		Development of biodiversity, mainly birds	-	-				
		Reduction of sand blown to landward roads with reduction of road maintenance needs	-	-	-	NA		

COMPONENT OR ACTIVITY	POTENTIAL EFFECT	POTENTIAL IMPACT	IMPACT ASSESSMENT			CORRECTIVE OR SUPPORT MEASURE		OVERALL RISK AFTER CORRECTION
		DESCRIPTION OF IMPACT	PROBABILITY	GRAVITY	OVERALL RISK	DESCRIPTION OF MEASURE	EASINESS OF IMPLEMENTATION	
Bao Ninh stormwater drainage	Favors infiltration of stormwater in the ground	Reduces investment cost, as smaller pipelines required for conventional drainage	-	-	-	NA		
		Reduces pollution transfer to Nhat Le river	-	-	-	NA		
		Refills superficial aquifer and control underground saline water front penetration	-	-	-	NA		
Early Flood Warning system	Anticipation of flood event	Provides potential for flood impact reduction and improved safety of population	-	-	-	NA		

6. PROJECT ALTERNATIVES

6.1. "NO PROJECT" ALTERNATIVE

The "no project" alternative will have the following impacts:

- The progress of the CCESP sanitation project will be delayed and equivalent to about 8,000 households will continue to rely on inefficient septic tanks resulting in pollution of underground water resources and of Nhat Le river.
- Stormwater drainage issue in part of Dong Hoi will not be solved if Cau Rao channel discharge capacity is not improved, affecting more frequently buildings and economic activities in the city.
- If the road system in Bao Ninh is not improved and calibrated to its future major role in the transportation system development of Dong Hoi City, major traffic congestion may happen as soon as Nhat Le 2 bridge is commissioned, with secondary impacts on air quality and economic activities.
- If the coastal dune is not protected and rehabilitated, its unavoidable disappearance will result in more frequent flooding of landward development during tropical storm events and accelerated erosion of the coastline with direct threat for the resort development presently on-going.
- If no flood early warning system is implemented, losses from flood will continue to raise and economic cost of flood event will also increase.

6.2. OTHER ALTERNATIVES

Several alternatives for the sub-components were proposed at the start of this PPTA, which have not been eventually considered because of their limited feasibility, their cost or/and their environmental and social impacts.

- Bao Ninh road improvement: Primary design included the widening of the road Nguyen Thi Dinh, a road densely populated on its both sides. Considering the major impact on involuntary resettlement of this alternative, the PPTA recommended to revise the proposed transportation plan to minimize social impact and particularly resettlement. The selected project achieves the objective as no resettlement is required and no building is demolished.
- Dong Hoi wastewater: There is not much an alternative as the proposed project is to complement the WB CCESP project which concerns individual connections to an existing network.
- Bao Ninh Stormwater management: Initial alternative, which construction started already, considered the release the stormwater on the beach through 5 pipes crossing the coastal dune. The 5 excavations were already completed at the start of the PPTA, with high risks of landward flooding from the sea during tropical storms. The PPTA proposed a new design (natural infiltration and excess drained to the Nhat Le, the 5 existing excavations in the dune to be filled and the dune restored to its original level).
- Cau Rao channel dredging: no particular alternative as the PPTA project is to complete the 300 m of channel not yet dredged. The rest of the channel is already dredged. From the environmental and social point of view, this subcomponent doesn't involve any significant impact, as the sediment will be disposed in the new disposal site under development for the sludge from the future Duc Ninh WWTP.

7. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

7.1. CONSULTATION AND PARTICIPATION PROCESS

The public consultation and participation process during the Project Preparation Stage has involved the following activities:

- Reconnaissance surveys of the Project site. On-site discussions with Dong Hoi City and town commune officials have provided information on the physical and biological resources, social-economic environment, opportunities and constraints relevant to the proposed Project.
- Participatory meetings with stakeholders and representatives from Quang Binh URENCO, Dong Hoi CPC, WPCs, the Centre of Health and the Women's Union Organization with the objective of collecting data and to present the Project (designs and locations), the main results from the draft IEE, and to ascertain social and environmental issues and concerns.

During the project implementation period, consultation and participation on environmental matters will be handled by the Environmental Management Staff who will be established within the Project Management Unit (PMU) based in URENCO.

7.2. CONSULTATION MEETINGS

Two public consultation meetings were held during the process of preparing the IEE and RP reports. Consultation meetings were organized jointly between IEE and RP teams.

7.2.1. SCHEDULE AND PARTICIPATION

The Public Consultation Meetings were held in Phu Hai Ward (Dong Hoi City) and in Bao Ninh Commune of Dong Hoi City respectively on 14 and 15 September 2013. Participants were representatives from the Commune/ Ward People Committees, the Women's Union, the Farmers' Union at commune/ward level, and representatives from beneficiary and affected households in communes/wards affected by the project. The two meetings involved total 78 participants (detailed in Appendix 1). Locations and number of participants is showed in the table below.

Table [22] SCHEDULE AND PARTICIPATION TO PUBLIC CONSULTATION MEETINGS

DATE	DISTRICT/ CITY	COMMUNE/WARD	MEETING LOCATION	NUMBER OF PARTICIPANTS		
				TOTAL	MALE	FEMALE
14 Sep 2013	Dong Hoi	Phu Hai	Meeting-hall of WPC	29	22	7
15 Sep 2013	Dong Hoi	Bao Ninh	Meeting-hall of WPC	49	34	15

7.2.2. INFORMATION DISCLOSED

- Objectives of the Projects;
- Location, designs and cost estimates of the Project;
- GOV and ADB environmental policies & procedures;
- The environmental category according to the ADB and GOV policies;
- Environmental issues related to Project location and design;
- Proposed mitigation measures;
- Grievance Redress Mechanism
- Environmental Management & Environmental Monitoring Plan

7.3. SUMMARY OF FEEDBACK FROM PARTICIPANTS OF THE MEETINGS

The feedback from the participants can be summarized as follows:

7.3.1. SOCIAL & COMPENSATION

- There is agreement on construction of infrastructure facilities of Urban Environment and Climate Change Adaptation Project in Dong Hoi City because the Project will contribute to economic development and improve environment for Phu Hai and Bao Ninh;
- Present road widening project in Phu Hai (NH1A) and compensation for land acquisition is on-going. Participants don't know exactly if pipe laying is inside or outside road drainage, but if it consists only pipe laying, impact negligible on local people in terms of land acquisition. People expect more support to compensate loss of business activity during works (6 months to 1 year);
- Participants expect good communication from project, particularly notification of work start date and time and duration of activities. Particular attention should be given to leveling after excavations, which means a good rehabilitation of the sites after construction works.
- In Bao Ninh participants expect the project to identify potential benefits for households resulting from each sun-project.
- They remind that in Bao Ninh peoples rely on fisheries at 65%, 30% sea food processing and 5% agriculture. Need to orient peoples more to travel services and associated activities with training (production of souvenirs, handicrafts) and expand the field of processed products for sea food. Develop high added value agriculture as fresh vegetables, and train peoples involved in food service stores in hygiene and safety.
- In case of resettlement, need to consider in the same village as more convenient for fishermen close to river. Expansion of North-South roads in the peninsula is convenient for the population.
- Displacement of graves can be organized only at certain period of the year. Project has to invest in new cemetery infrastructure.

7.3.2. ENVIRONMENT

- Agree with the consultants on existing environmental assessment, mitigation measures recommended by the project consultant.
- Expect the project help providing clean water to Bao Ninh particularly Sa Dong village.
- Participants expect project will have appropriate measures to reduce dust, noise and mud during activities.
- Works progress should be implemented timely, should not be delayed affecting the livelihood of people living along construction material & waste transportation roads

7.3.3. CONCLUSION

- There is agreement on construction of infrastructure facilities of Urban Environment and Climate Change Adaptation Project in Dong Hoi City
- Agree with the consultants on existing natural and social-economic environment assessment, mitigation measures, environmental management and monitoring plan.

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8. GRIEVANCE AND REDRESS MECHANISM

A grievance redress mechanism (GRM) will be established in Quang Binh Province in compliance with ADB's SPS (2009) requirement to prevent and address community concerns and assist the project to maximize environmental and social benefits.

The GRM will be accessible to diverse members of the community, including more vulnerable groups such as women and youth. Multiple points of entry, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available. Opportunities for confidentiality and privacy for complainants will be honored where this is seen as important.

8.1. PROPOSED MECHANISM

URENCO will establish a Project Public Complaint Unit (PPCU). The PPCU will instruct contractors and construction supervisors if people complain about the project. The PPCU will coordinate with Project Management Unit of Dong Hoi City Project (PMU), Quang Binh Department of Transportation (DOT), Dong Hoi City People Committee (CPC) and local DONRE offices if necessary, and will be supported by the environmental consultants of the Project Management Support Consultant.

When construction starts, a sign will be erected at each construction site providing the public with updated project information and summarizing the grievance redress mechanism process including details of the GRM entry points. The contact persons for different GRM entry points, such as PMU, community leaders, contractors, and operators of project facilities, will be identified prior to construction. The contact details for the entry points (e.g. phone numbers, addresses, e-mail addresses, etc.) will be publicly disseminated on information boards at construction sites and on the website of the local government.

The PPCU will establish a GRM tracking and documentation system. The system will include the following elements: (i) tracking forms and procedures for gathering information from project personnel and complainant(s); (ii) dedicated staff to update the database routinely; (iii) systems with the capacity to analyze information so as to recognize grievance patterns, identify any systemic causes of grievances, promote transparency, publicize how complaints are being handled, and periodically evaluate the overall functioning of the mechanism; (iv) processes for informing stakeholders about the status of a case; and (v) procedures to retrieve data for reporting purposes, including the periodic reports to the ADB.

8.2. TYPES OF GRIEVANCES EXPECTED AND ELIGIBILITY ASSESSMENT

Public grievances addressed by the GRM will most likely relate to environmental issues during the construction phase, as consultations with potentially affected people conducted during project preparation confirmed their basic support to the project. Grievances will most likely include damage to public roads due to heavy vehicle operation and transportation of heavy equipment and materials; disturbance of traffic and increased traffic congestion; dust emissions; construction noise; inappropriate disposal of waste materials; damage to private houses; safety measures for the protection of the general public and construction workers; water quality deterioration.

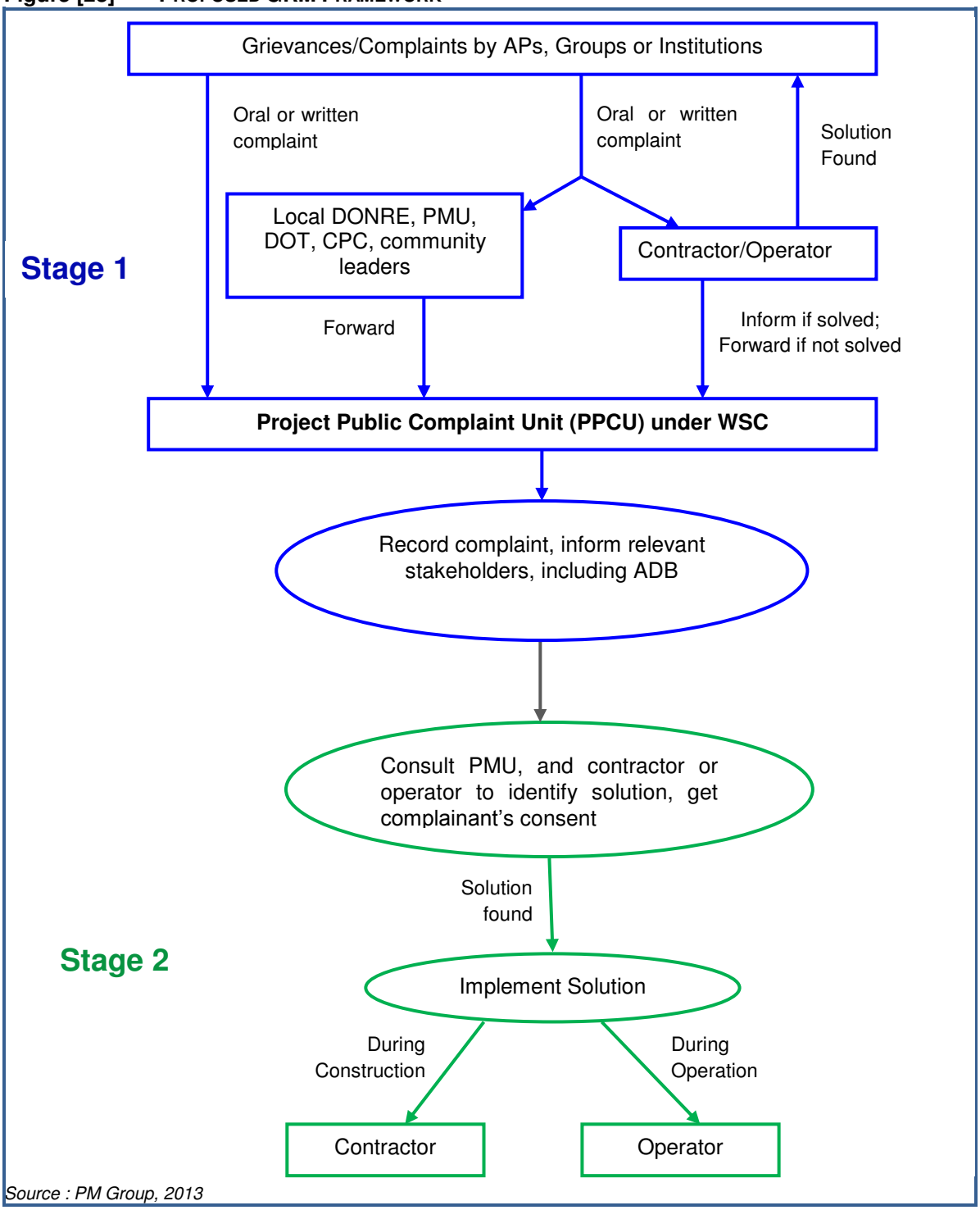
Additionally, the procedure available under the Civil Law and the Land Law 2003 (Article 138) and Decree 197/2004/ND-CP (Articles 63 and 64) remain an avenue for redress of grievances independent and separate from the Project GRM.

8.3. GRM PROCEDURE AND TIMEFRAME

The procedure and timeframe for the grievance redress mechanism are described as follows (see Figure VII.1). The two stages are represented by different colors in the flow diagram:

Stage 1: If a concern arises during construction, the affected person will submit a written or oral complaint to the contractor directly (the contractor's environment health and safety coordinator or any onsite construction personnel). Whenever possible, the contractor will resolve the issue directly with the affected person. The contractor will give a clear reply within one week. If successful, the contractor will inform the PPCU accordingly.

Figure [23] PROPOSED GRM FRAMEWORK



Source : PM Group, 2013

Stage 2: If no appropriate solution can be found, the contractor should forward the complaint to the PPCU within five (5) working days. The complainant may also decide to submit a written or oral complaint to the PPCU, either directly or via one of the GRM entry points (community leader, Dong Hoi CPC, Local DONRE, Dong Hoi City's Environmental Management Department.). For an oral

complaint, proper written records must be made at the time of the complaint. The PPCU will assess the eligibility of the complaint, identify the solution and provide a clear reply for the complainant within five (5) working days. The PMU will assist the PPCU in replying to the affected person. The PPCU will also inform the ADB project team and submit all relevant documents. Meanwhile, the PPCU will timely convey the complaint/grievance and suggested solution to the contractors or operators of facilities. The contractors during construction and the operators during operation will implement the agreed upon redress solution and report the outcome to the PPCU within seven (7) working days.

The PPCU shall accept complaints/grievances free of charge. Any cost incurred should be covered by the contingency of the project. The grievance procedures will remain valid throughout the duration of project construction and until project closure.

The above mechanism is specific to the Construction Works. Should the grievance not be resolved via this specific mechanism the complainant will have recourse to the overall GRM (consistent with the resettlement plan) as summarized below:

There here are four (4) stages in the resolution of grievances and complaints under the Project.

(First Stage: Ward People's Committee - An aggrieved person may lodge his/her complaint before any member of the Ward People's Committee through the Ward Chairperson or directly to the Ward People's Committee, in written or verbal form. It is incumbent upon the Ward Chairperson to notify the Ward People's Committee about the complaint. The Ward People's Committee will meet personally with the aggrieved affected household and will have 15 days to resolve the complaint. The Ward People's Committee secretariat is responsible for documenting and keeping file of all complaints that it handles.

(ii) Second Stage: District People's Committee - If after 15 days the aggrieved person does not hear from the Ward People's Committee, or if the affected person is not satisfied with the decision taken on his/her complaint, the complainant may bring the case either in writing or verbally to any member of the Center for Land Fund Development or the District People's Committee. The District People's Committee or Center for Land Fund Development will have 15 days to resolve the grievance or complaint. The District People's Committee is responsible for documenting and keeping file of all complaints and will inform the Center for Land Fund Development/PPCU of its decision. The Center for Land Fund Development or the PPCU will ensure that the AP is notified of the decision.

(iii) Third Stage: Provincial People's Committee – If after 15 days the aggrieved affected household does not hear from the District People's Committee, or if the affected household is not satisfied with the decision on his/her complaint, the affected household may bring the case either in writing or verbally to the PPC. The PPC has 15 days within which to resolve the complaint to the satisfaction of all concerned. The PPC is responsible for documenting and keeping file of all complaints and inform the APs of its resolution.

(iv) Final Stage: The Court of Law – If after 15 days the aggrieved affected household does not hear from the PPC after filing the complaint, or if he/she is not satisfied with the decision by PPC, he/she may bring his/her case to a court of law for adjudication.

The above grievance redress mechanism would be disclosed and discussed again with the APs prior to loan appraisal by ADB to ensure their understanding of the process. The designated entity (in this Project it would be Dong Hoi URENCO) and the Center for Land Fund Development (in the case of resettlement/land acquisition) are responsible for following-up the grievance process of the APs.

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9. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

9.1. PURPOSE & OBJECTIVES

The role of the EIA process is to identify the impacts which may be caused by the project and to develop a series of attenuating or mitigating measures which will be technically appropriate, financially acceptable and easily applicable in the context of the project. These measures are identified in Section 0 of the present EIA.

The role of the EMP is to complement this analysis by defining the operational context in which these measures will be implemented. The present chapter therefore sets out the principles, the approach, the procedures and methods which will be applied to monitor and reduce the environmental and social impacts resulting from the construction works and subsequent operation of the components projected in Dong Hoi.

To this effect, the EMP includes 3 complementary Action Programs that are adapted to the phases of pre-construction, construction and operation of the Project components:

- The Preliminary Action Program (PAP), which includes all the measures recommended during the early stage of the Project, particularly before the construction works start. These measures essentially concern the organization and training of the teams which will be responsible for environmental and social management during construction and operation of the project, as well as all the complementary studies and investigations identified during preparation of the EIA and deemed to be necessary before starting the construction works.
- The Program of Actions adapted to the Construction period (PAC), which defines the principles of organization and the environmental inspection procedures for the construction sites. This PAC also defines the contractors' obligations in relation to environmental and social management of the construction sites and camps.
- The Operational Phase Action Program (PAE), which defines the environmental quality controls (water, air and noise) applicable during the period of operation of the structures and necessary to evaluate the environmental efficiency and performance of the corrective measures put in place.

The present EMP accordingly establishes and describes the context in which all the proposed corrective measures shall be implemented, under the following headings:

- the organization to be established to ensure effective implementation of the corrective measures and the associated environmental monitoring;
- the role and responsibilities of the various parties to be involved in the Project;
- the principal tasks to be undertaken during the phases of preparation, construction and operation of the project;
- the complementary studies deemed to be necessary;
- financial resources to be mobilized and their origin.

The various management plans proposed will be drawn up according to the current state of engineering design of the Project.

All the measures proposed in this EMP are based on the results of the analysis of impacts and corrective measures outlined in previous Chapter 0 of the present EIA. These aspects will not therefore be repeated here.

9.2. SUMMARY OF KEY IMPACTS

As detailed in the Section 5 of the report, the anticipated key impacts from the project components are summarized in the following table.

Table [23] SUMMARY OF KEY IMPACTS

COMPONENT	ANTICIPATED KEY IMPACTS
Dong Hoi Wastewater	No land acquisition and resettlement (Issues covered in RAP)
	Potential cutting of few trees
	Mainly risk of nuisances/impacts from construction activities
Phu Hai wastewater	401 m² land acquisition which affects 49 HH.
	No resettlement, no building affected
Bao Ninh Wastewater	Land acquisition (0.78 ha affecting 71 HH). No resettlement (Issues covered in RAP)
	Limited risk of nuisances/impacts from construction activities
	No impact on natural resources
Bao Ninh Roads, urban devt, stormwater drainage	Land acquisition but none private. No resettlement (Issues covered in RAP)
	Some risk of nuisances/impacts from construction activities,
	Land partly covered by Casuarina trees
	Ancient graveyards to be displaced, new site for relocation already acquired
Bao Ninh Coastal Dune	No land acquisition, improvement of natural resources (vegetation, protection)
	Some risk of nuisances/impacts from construction activities

As observed from this table, major impacts from the project mainly concern land acquisition and resettlement and impacts related to construction activities. As land acquisition and resettlement are addressed in the Resettlement Plan (RP), this EMP will principally focus on construction activities supervision and monitoring activities during construction period and first few years of operation.

The recommended mitigation measures for the adverse impacts summarized above and detailed in the previous chapters are summarized in Table 27 overleaf. These mitigation measures will be implemented by the relevant contractors (with costs included in the associated contracts) and supervised by the PMU and the environmental specialist in the supervision team.

Table [24] ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

COMPONENT OR ACTIVITY	POTENTIAL RISKS	DESCRIPTION OF POTENTIAL IMPACT	CORRECTIVE OR SUPPORT MEASURE DESCRIPTION OF MEASURE
Land preparation	Excessive destruction of trees	Impact limited to Dong Hoi wastewater component where few street trees may have to be cut, and to the Bao Ninh urban development area which will involve the cutting of Casuarina trees	Monitoring of tree cutting by SE, and maximization of conservation
			Greening program considering at least 1 tree planted for 1 tree cut
	Interference with compensation & resettlement	Construction works start while land acquisition is not completed, raising conflicts with concerned population	Procedure with issuance of a land acquisition certificate as a prerequisite for authorizing contractor to access the land.
			Monitoring by SE-DES of land acquisition progress and of issuance certificate
Workers' camps	Pollution of surface water and groundwater	Wastewater discharged into the external environment without treatment	Wastewater receives treatment before being released outside premises (septic tanks/drains)
			Contractor to monitor the quality of effluents released outside the bounds of the camps
	Zones of stagnant water	Proliferation of water-borne disease vectors (mainly dengue fever and malaria)	Create and maintain ditches to ensure efficient drainage and drain all stagnant water zones in camp
			Regular treatment of living areas with approved pesticides
	Health risks	Development of diseases linked to deficit in hygiene	Systematic awareness sessions for all new arrivals at the camp: meetings, posters in circulation areas, monitored by the camp chief
		Risk of epidemics in the camps	Prevention by automatic medical check-up at hiring
			Monitoring of hygiene conditions at the camps
			Anti-malarial prophylaxis, including mosquito netting
			Communication with the surrounding populations and local authorities.
	Workers' living conditions	The most serious impact would be that the contractor does not provide acceptable housing facilities and subsistence to the workers.	Include detailed specifications for equipment and management of camps in the tender documents.

COMPONENT OR ACTIVITY	POTENTIAL RISKS	DESCRIPTION OF POTENTIAL IMPACT	CORRECTIVE OR SUPPORT MEASURE DESCRIPTION OF MEASURE
Water supplied in workers' camps	Non-potable water supplied.	Impact on public health, risk of epidemics. Risk is limited as the project components are located within or next to urban areas, camps will be limited in number and size and easily connected to Dong Hoi water supply network	Supply packaged water (bottles, 20 litre tubs) for the small camps on sites (with few peoples sleeping on site)
			Contractor to regularly monitor coliforms
Workshops and garages	Water and soil pollution	Stormwater drainage contaminated by pollutants flowing to the Nhat Le river. Impact concerns all components of the project but a more sensitive issue for Cau Rao working in an aquatic environment	Drains of working facilities equipped with oil separators
			Properly store hazardous products (including hydrocarbons). See activity "Use and storage of hazardous products"
			Monitor and control used oil: Monitoring registers/logs and dedicated storage areas.
Dredging	Water pollution	Impact limited to Cau Rao channel. Suspended sediment is released in the water increasing turbidity	Operating methods to be detailed in advance in the Dredging and Sediment Management Plan, highlighting method to confine suspended sediment to the smallest volume of water Monitoring of activities by SE-DES
	Loss of cultural resources	Low risk in this WR. However, the possibility exists of archaeological physical resource discovery during excavation work with the total loss of the relic if special measures are not taken.	Implement a Chance to Find procedure aimed at halting work and warning the supervisors and the national authorities concerned so measures can be taken to preserve the discovery and restart work as quickly as possible. Personnel to be aware of the procedure.
	Risk of explosion	Potential public safety risk if an UXO is discovered during dredging of Cau rao	UXO clearing of all construction sites prior to start earthworks; procedure in place in case of finding during works
Hazardous waste management	Water and soil pollution	Located in urban area, most truck maintenance will be done in private garages. Only heavy machinery may receive basic maintenance and refueling on site. Limited volumes of used engine oil and used hydraulic oil will be produced on site and will need appropriate storage to avoid soil and water pollution	Require the contractor to prepare a Hazardous Waste Management Plan
			Use storage sites that meet safety standards
			Identify the existing used oil recycling centres in the Province
			Contractor to maintain a log of production/recycling of used oil
Concrete production	Public health	Impact on the health of personnel handling cement	Supply personal protective equipment to the workers and check that it is used. Favor concrete from existing industrial plant
	Water pollution	Water pollution by the alcaline wastewater from equipment and trucks cleaning operation (particularly the cleaning of concrete trucks)	Require the contractors concerned to install sedimentation ponds with pH adjustment
			Contractor to monitor the quality of effluent released

COMPONENT OR ACTIVITY	POTENTIAL RISKS	DESCRIPTION OF POTENTIAL IMPACT	CORRECTIVE OR SUPPORT MEASURE DESCRIPTION OF MEASURE
Production of solid non-hazardous waste	Water and soil pollution	Pollution by domestic waste: Possible impact if waste is not managed according to best practices in worker camps and construction sites Only small camps anticipated which limits the potential magnitude of the impact.	Contractor to submit a Solid Waste Management Plan including methods and procedures for (i) awareness training of residents, (ii) collection and storage of waste on project sites, (iii) selective collection and recycling of waste (iv) eventual collection and disposal of waste, (v) identification of service companies
		By construction waste: Limited risk for inert products but high visual impact	Identify suitable landfill sites, if possible associated with sediment disposal site for products such as concrete and plaster
			Encourage reuse and recycling especially of metals, plastics and glass
Earthworks	Risk of explosion	Potential public safety risk if an UXO is discovered during earthworks particularly in Bao Ninh	UXO clearing of all construction sites prior to start earthworks; procedure in place in case of finding during works
Sediment and Spoil Disposal	Landuse	No land acquisition anticipated as disposal area already under development.	Optimize re-use of sediment in the vicinity of Cau Rao to minimize transportation of sediment
		Temporary disposal of sediment before it is used or transported to disposal site may impact land use	Contractor to detail sediment management in the Dredging and Sediment Management Plan including temporary disposal methods and sites
	Water pollution	Erosion of the deposit and sedimentation in the natural drainage or in low lying areas	Good practices for erosion and sedimentation control to be detailed and implemented by contractor
	Public safety	Unstable excavations and slopes of spoil disposal may present risk of landslide	Respect geotechnical best practices (compacting of material, slopes). Choose sites far from sensitive structures and camps
Road Traffic	Public safety	Potential risk of road accidents related to increased traffic of trucks in urban areas and restriction on traffic imposed by works on roads in Bao Ninh and on sewerage in Dong Hoi	Selected hauling routes and preventive/monitoring measures to be presented by the contractor in the Road Traffic and Access Plan
			Monitoring of driver behaviors in relation with police department
Road Traffic (Cont)	Risk of traffic disruption in urban zones	Most significant impact anticipated for Bao Ninh roads and Dong Hoi wastewater components	Road Traffic and Access Management Plan to detail procedures for traffic management: coordination with police, public information, signs and safety etc.
	Air pollution	Excessive exhaust gas emissions	Keep engines serviced
		Production of dust	Speed control, regular sprinkling of sensitive urban areas and on construction sites
Handling of hazardous products	Fire risk	Related to the storage of flammable products: hydrocarbons, paints, solvents. Potential risk on most sites involving heavy machinery	Provide fire equipment at each storage site (extinguishers, fine sand) and safety posters displayed onsite.
			Set up a safety procedure and awareness/training for personnel concerned.

COMPONENT OR ACTIVITY	POTENTIAL RISKS	DESCRIPTION OF POTENTIAL IMPACT	CORRECTIVE OR SUPPORT MEASURE
			DESCRIPTION OF MEASURE
	Risk of accidents for the personnel	Burning during handling operations, but risks reasonnably limited	Provide training for personnel plus personal protective equipment and onsite safety data sheets for the products concerned
	Water pollution	Potential risk of accidental spillage: Leak in a storage tank, accidental spillage when handling or refuelling engines, road accident when transporting hydrocarbons.	Contractor to prepare hazardous products management plan, in particular: Store using containment trays, measures for preventing and detecting leaks and accidental spills, register/log of hazardous products and their use, antipollution equipment.
			Emergency response procedure in the case of accidental spillage
			Special safety measures for refuelling engines onsite

9.3. EMP ORGANIZATION AND RESPONSIBILITIES

9.3.1. OVERALL ORGANIZATION

At the present level of the Project preparation, it is anticipated that the project will be developed under the following conventional conditions:

- Public investment, with the Quang Binh Province People's Committee (QBPPC) as the Executive Agency (EA) and URENCO as the Implementing Agency;
- Creation of a Project Management Unit (PMU) under URENCO and based in Dong Hoi . This PMU will receive the support of a Project Management Support Consultant (PMSC);
- Appointment of a Supervision Engineer (SE) to supervise design and construction of the Project components;
- Appointment of Construction Contractors.

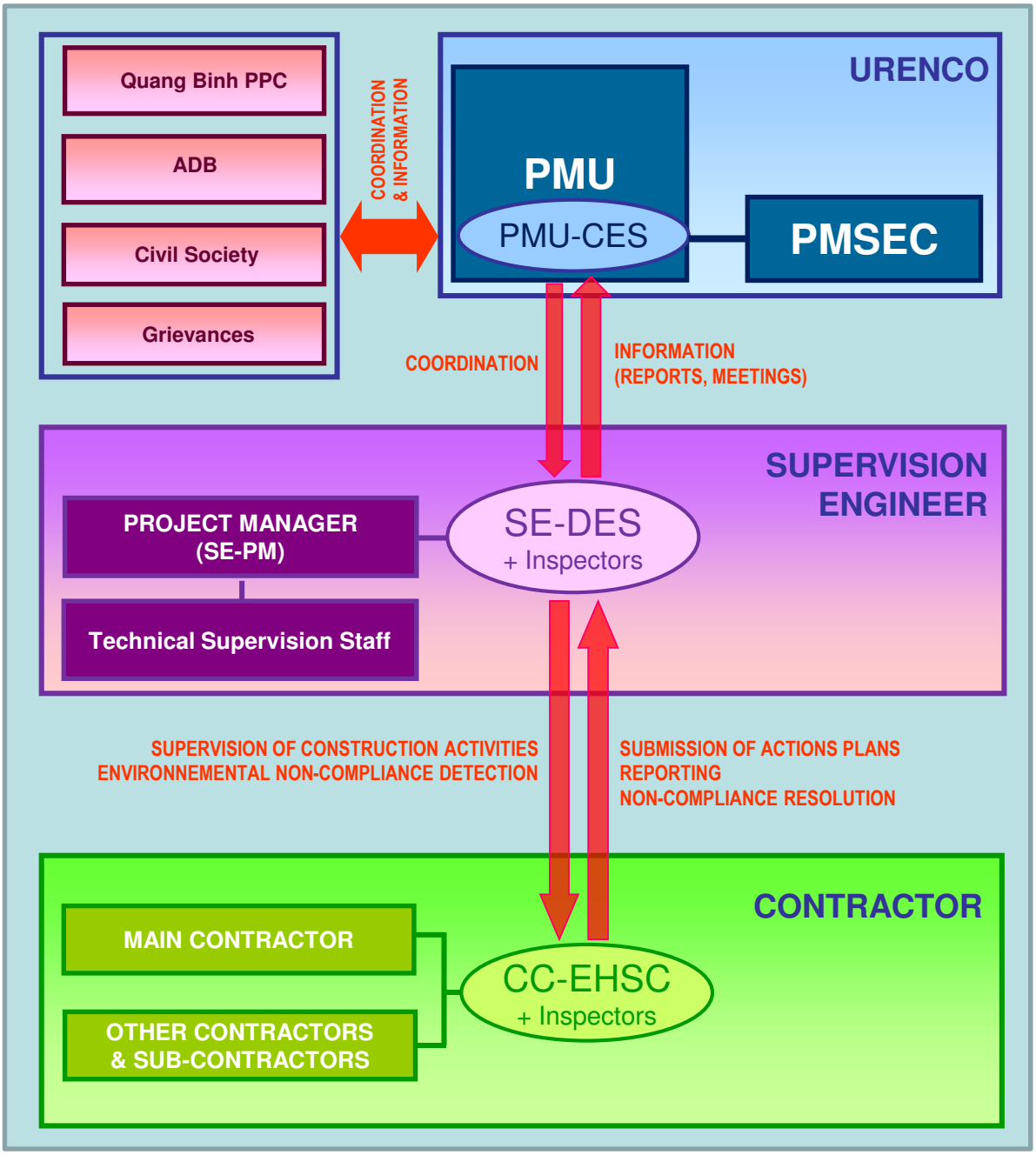
The proposed organisation for the EMP is based on this general organisation and summarised in the figure overleaf.

Three levels of organization, fully complementary, will be set-up:

- The Government Implementing Agency (IA) through its PMU, which will have to provide for all aspects related to environment and social including (i) general supervision of activities carried out prior, during and after construction of the project and (ii) coordination with other stakeholders including other Government Agencies and IFIs involved;
- The Project Management Support Environmental Consultant (PMSEC) will assist PMU for all aspects dealing with environmental management preparation provide environmental training to PMU staff and annual environmental audit of the construction sites.
- The Supervision Engineer Environmental Management Unit (SE-EMU), who is to provide coordination and supervision for all environment-related activities during construction, and to report regularly to the IA Project Director;
- The Construction Contractor Environment Health and Safety Unit (CC-EHSU), who is to provide resources for, and effective implementation of, all measures which are defined in the EMP and in the contract documentation in addition to health and safety aspects on site. There will be one CC-EHSU per Project component under the responsibility of the main CC for this component and covering the needs for sub-contractors.

Environmental staff in the PMU, SE and CC is intended to be independent of construction staff. Environmental staff will work alongside construction staff, however they will report through separate channels up to the Project Director for the SE and to the executive management level for each CC concerned.

Figure [24] EMP IMPLEMENTATION



9.3.2. STAKEHOLDER'S ORGANIZATION

The IA-PMU will have an integrating role at the top of the organisation. It will be responsible for (i) informing the political and financial agencies of the correct implementation of the EMP and (ii) ensuring effective compliance in terms of E&S obligations and procedures in the implementation of the Project. To do this, it will appoint a **Chief Environmental and Social (CES)**, whose role will be (i) to supervise the Project's environmental and social activities in the name of the IA and (ii) to ensure coordination with the international agencies (funding agencies, investors, panel of experts) and national agencies (other Government Ministries, NGOs). The PMU-CES will in particular follow up and ensure operations relating to compensation and resettlement of APs resulting from the implementation of the project components are progressing satisfactorily. The CES will be assisted

in this supervisory role by the Project Management Support Environmental Consultant (PMSEC) which will work on a temporary but regular basis right from the start of the project and through to the first year of operation of the project.

The SE will set up within its Engineering Team an **Environmental Management Unit (EMU)** which will monitor implementation of the environmental measures and their performance. This team will be under the responsibility of a **Director Environment and Social (DES)** assisted by engineers and technicians responsible for environmental aspects directly related to the construction activities and social aspects related to health and safety on the sites, complaints expressed by the population, any disturbances or harmful impacts they are subjected to, claims for compensation for temporary disorders related to the construction activities and liaison with the traditional local authorities or representatives of the State. The EMU will include a team of Site Inspectors.

Each CC having responsibility for one of the main contracts will set up its own EHS Unit (EHSU) responsible for providing the interface with its construction team. Depending on how the contracts are distributed, certain contractors may group together to set up a common environmental team. Each EHSU will have an **EHS Coordinator (EHSC)** and Environment, Health & Safety (EHS) Inspectors.

9.3.3. STAKEHOLDER ROLES AND RESPONSIBILITIES

9.3.3.1. ROLE OF THE PMU-CES (IMPLEMENTING AGENCY)

Project Preparation Phase

- Coordinate, with those concerned, the definition of the environmental measures at the level of detailed design and prepare the corresponding environmental obligations of the contractors as General and Particular Specifications in the Tender Documents;
- participate in the evaluation of the tenders and negotiation with the contractors for all the environmental and social aspects;
- ensure coordination with the financial institutions involved (ADB), in order to guarantee compliance with their specific environmental and social requirements;
- ensure, with those concerned, the monitoring and coordination of all consultations carried out with the local population prior to starting the construction works; this aspect is particularly important for the road and urban development components;
- coordinate with the Government Authorities concerned, the issues of land acquisition and compensation operations required to be completed before the start of construction works;
- prepare timeline for compliance with various national applicable laws and requirements including environmental obligations/permits/approvals.

Construction Phase

- Ensure coordination of activities with the Supervision Engineer-Environmental Management Unit (SE-EMU);
- participate in environmental coordination meetings with the representatives concerned from the staff of the Supervision Engineer and Contractors;
- directly refer results and problems encountered to the PMU-Project Director;
- contribute for E&S aspects to the monthly and/or quarterly Works Progress Reports prepared to the attention of the IA, of the EA and of the ADB;
- provide liaison with MONRE and DONRE and other Provincial and Communal authorities.

Operating Phase

At the end of the Project construction (5 years), the various components will come under the responsibility of various institutions: URENCO for the various wastewater and drainage sub-components, Department of Transportation for Bao Ninh roads, DONRE for the restored dunes. Each institution will need to be clearly informed about the environmental monitoring requirements and to have organized to follow up the environmental aspects.

Before the end of the Project, the PMU-CES will be in a position to:

- Ensure coordination with agencies in charge of the components after their construction for environmental monitoring activities to be implemented;
- ensure monitoring of the environmental activities required on the site are efficiently implemented by the organizations in charge;
- ensure effective completion of the measures to rehabilitate the sites temporarily used during construction;

9.3.3.2. ROLE OF THE ENVIRONMENTAL PROJECT MANAGEMENT SUPPORT CONSULTANT (PMSC)

- At the start of the Project Contract, the PMSEC will provide training to PMU-CES and other staff of PMU regarding content of EIA reports and EMP obligations, organization of PMU for environmental management;
- Preparation of baseline template documentation required for PMU-CES activities: weekly, monthly report structure, template checklists for site inspection, etc.
- Assistance for ToR and contract preparation for effect monitoring (air, water) to be carried out by any registered laboratory appointed by PMU;
- During construction period, annual environmental auditing of all construction sites and preparation of annual environmental auditing report.

9.3.3.3. ROLE OF THE DES (SUPERVISION ENGINEER)

- Organize and control the work performed by the Environmental Management Unit (EMU);
- ensure coordination with the PMU-CES;
- ensure that all environmental plans and programs requested from the CCs (this generic term covering all the main Contractors) have been submitted and have been non-objected prior to the start of works;
- with his inspectors' collaboration, check whether the Contractor's environmental obligations have effectively been complied with on the sites, and refer to his manager (the SE-Project Manager) any detected case of non-conformity for formal action;
- report any observed case of non-conformity and ensure that it is remedied by the concerned CC within the imposed time limit;
- participate in the site monitoring meetings and prepare a monthly environmental monitoring report covering all project components;
- prepare the monthly evaluation report, recording the Contractor's environmental efforts, which may, if necessary, be used to justify a deduction on the monthly claim for payment presented to the IA-PMU;
- ensure the regular implementation of compliance monitoring programs (water and air quality) and present the interpretation of results in the context of the monthly report;
- provide liaison with the local communities concerned for any social aspect including health, respect of recruitment procedures, land use agreements, handling of complaints and compensation for unexpected damages to private property during construction activities;

- organize a database for storing all environmental documentation generated during construction of the project (letters, memos and technical notes, registers, site photos, non-compliances and resolution forms, etc.);
- prepare the documentation required prior to the project's environmental and social audits performed by the Project Management Engineer.

9.3.3.4. ROLE OF THE EMU-SITE INSPECTORS (SUPERVISION ENGINEER)

- Perform regular visits to the construction sites and the worker camps; frequency will be adjusted according to the environmental risks, the sensitivity of the environment and the contractors' performance);
- establish reports on all detected cases of non-compliance and follow up their resolution by the CC;
- regularly provide input to the environmental database, in particular the reports on non-compliance, the records of non- compliance correction and the supporting photographic documents.

9.3.3.5. ROLE OF THE CONSTRUCTION CONTRACTOR EHS COORDINATOR (EHSC)

The CE's activity must be devoted solely to the CC's environmental and social management. He must be sufficiently high-ranking in the organisation to be capable of imposing his decisions on the Works Supervisors and Foremen. In particular, the power to stop construction activity, for reasons of environmental protection or safety, is a fundamental prerogative to ensure efficient environmental management on construction sites.

The EHS, with the support of his team, will have the following responsibilities:

- adapting construction activities to ensure they comply with the environmental and social obligations defined in the Tender Documents and the Terms of the Contract;
- ensuring that all sub-contractors of his company comply with the same environmental and social obligations;
- preparing the environmental plans and programs specified by the Tender Documents, in particular the monitoring programs;
- supervising the environmental good practices for construction activities on all construction sites used by the Contractor or his sub-contractors, by calling on his inspectors to make regular inspection visits;
- treating cases of non-compliance notified by these SE-DES and instructing the construction teams to apply the necessary remedial measures immediately;
- preparing the weekly and monthly activity reports for presentation to the DES;
- organizing and performing E&S training of CC staff (management & workers).

9.4. KEY ENVIRONMENTAL MANAGEMENT PROCEDURES

9.4.1. COMMUNICATION PROCEDURES

9.4.1.1. INTERNAL COMMUNICATION

The efficiency of environmental and social management is dependent upon the clear organisation of communication among the stakeholders. In particular, there has to be a clearly defined channel for handling rapidly all possible environmental disorders and implementing efficiently the necessary remedial actions, especially in emergency situations.

The following table presents the key links with regard to internal communication among the stakeholders during the construction period. This procedure must be laid down in greater detail before the start of the project in accordance with the Contractor EHS policy and the final Project organisation.

Table [25] PRINCIPAL PHASES OF INTERNAL COMMUNICATION

ORIGIN	RECIPIENT	FREQUENCY	SUBJECT
SE-Project Manager	SE-DES	Weekly	Updating the construction programme; specific construction activities in the coming period and their location
SE-Project Manager	PMU-CES, SE-DES	Ad hoc	Additional needs for land, or notification of a change in construction techniques
SE-DES	SE-Project Manager	Weekly	Weekly report on environmental events (EE) detected and their treatment; programme of activity of the SE-EMU for the coming week
SE-DES	SE-Project Manager	Ad hoc	Communication of EE of levels II or III
SE-DES	SE-Project Manager	Monthly	Monthly report on activity and results of monitoring for review and approval before forwarding to the PMU-CES
SE-DES	SE-Inspectors	Weekly	Updating the construction programme; specific construction activities in the coming period and their location, particular directives
SE-Inspectors	SE-DES	Weekly	Weekly activity report, list of observed EE of level I
SE-Inspectors	SE-DES	Immediate (same day)	Observed EE of levels II & III; particular problem requiring technical assistance; observation of construction activities outside specified areas
CC-EHSC	SE-DES	Monthly	List of training modules followed in the past month and the personnel concerned (list of attendence)
CC-EHSC	SE-DES	Fortnightly	Updating of new activity zones for the coming 2 weeks and operations presenting a particular risk for the environment; results of monitoring of the previous 2 weeks
SE-Project Manager	PMU-CES	Immediate (same day)	Memo to inform on any observed non-compliance on level III; proposal to suspend the works on the incriminated site if justified
SE-Project Manager	PMU-CES	Monthly	Transmission of the monthly activity report including environment as prepared by the SE-DES
SE-DES	SE-Project Manager	Quarterly	Summary report on significant environmental events (Levels II and III) observed, on the decisions taken, and on the measures implemented; proposal, if necessary, to modify certain mandatory thresholds or obligations of the Contractor
SE-Project Manager	PMU-CES	Quarterly	Summary report on significant environmental events (Levels II & III) observed, on the decisions taken, and on the measures implemented; request for approval of the proposed modifications
PMSEC	PMU-CES	Yearly	Annual audit of construction sites and submission of an annual environmental audit report
Note: PMU-CES (Chief Environment & Social from Implementing Agency PMU) – SE-DES (Director Environment & Social from Supervision Engineer) – CC-EHSC (Contractor's EHS Coordinator) - EE (Environmental Event = detected non-compliance)			

9.4.1.2. EXTERNAL COMMUNICATION

External communication for environmental and social subjects will be the prerogative of the IA through the intermediary of his PMU-CES, assisted by the IA's Director of Communication. This communication will essentially concern exchanges of information with the media, with NGOs and with Government representatives at Central and District levels. The SE-DES and the CC-EHSC will only intervene in these exchanges when expressly invited to do so by the IA.

The PMU-CES will regularly contribute for all E&S aspects to the activity report provided to ADB, various government organisations and NGOs in Vietnam.

9.4.2. PROCEDURE FOR HANDLING ENVIRONMENTAL EVENTS

An important element of the process of communication among the parties is the ranking of events which do not meet the obligations and environmental objectives assigned to the project. These situations detected on site by the SE-EMU must then be notified to a higher level but following procedures that are graduated according to the extent of the risk and the urgency of remedial action. These environmental events could be ranked according to the system of quality assurance applied to the construction works, in which case their subdivision would be variable according to the subdivisions taken into account for non-conformity of a technical nature. In the present EMP, considering the absence of information on the project's future quality assurance plan, preference is given to an evaluation system specific to environmental aspects, better adapted to the problems encountered and which represents a proven and reliable system, which can work satisfactorily even in the absence of an efficient quality assurance system.

Environmental events correspond to non-conformities (non-compliances) and are subdivided into three levels. The communication and handling procedures depend on the level of non-conformity. Level III represents the most serious incidents, while level I represents the incidents of least gravity.

Level I (Minor Incident): Situations on Level I are addressed on a day-to-day basis at the time of site visits and routine meetings; the recommended measures are generally discussed on the spot with the construction teams concerned. Formal communication takes place through the Environmental Event (EE) report prepared by the EMU Inspectors and handed to the SE-DES for official notification to the concerned CC-EHSC.

Level II (Moderate Incident): The EE of Level II is notified by the SE-DES to the SE-Project Manager and the CC Site Supervisor the same day as the situation is observed, and within three days to the PMU-CES. The PMU-CES informs the PMU Project Director of the situation and details the proposed corrective measures, which must be implemented as rapidly as possible.

Level III (Major Incident): The SE Project Manager and the PMU Project Director must be informed on the day an event is observed. The corrective measures must be applied within three days. Should more time be required to implement a corrective measure, or if the risk is imminent, the SE Project Manager may order suspension of the works concerned until the observed situation returns to normal.

Following Figure [25] below illustrates the principles of this non-conformity procedure and shows how the approach favours direct resolution on site of the less serious EE (Level I) by direct communication with the construction workers, and how the senior levels of responsibility are progressively involved in the processes to solve the more serious EE (Levels II and III). The full arrows denote the decision processes, while the dotted arrows denote the reporting and information processes.

This procedure is often implemented on complex work sites, and generally gives satisfactory results. It also offers three advantages:

- a mechanism allowing the works to be stopped if the situation is deemed to be hazardous;
- provision for feedback so that the site inspectors monitoring implementation of the requested measures can ensure that the remedial action has been taken;
- the possibility of initiating an incident enquiry in order to determine the deep-seated causes of the incident and to assess whether they justify changes in the specifications, the requirements or the methods, to prevent reoccurrence of such a situation in the future.

9.4.3. RECRUITMENT PROCEDURE

Recruitment will be made preferentially in Dong Hoi and its surroundings to minimize the requirement of worker camps in number and size and minimize attached problems.

Recruitment will include a systematic medical examination of each employee, covering the candidate's general condition and his or her hearing and visual capacities. To avoid any discrimination, the tests relating to infection risks (tuberculosis, malaria and other forms of parasites, STD) will be performed after the candidate has been recruited, in Dong Hoi hospital facilities.

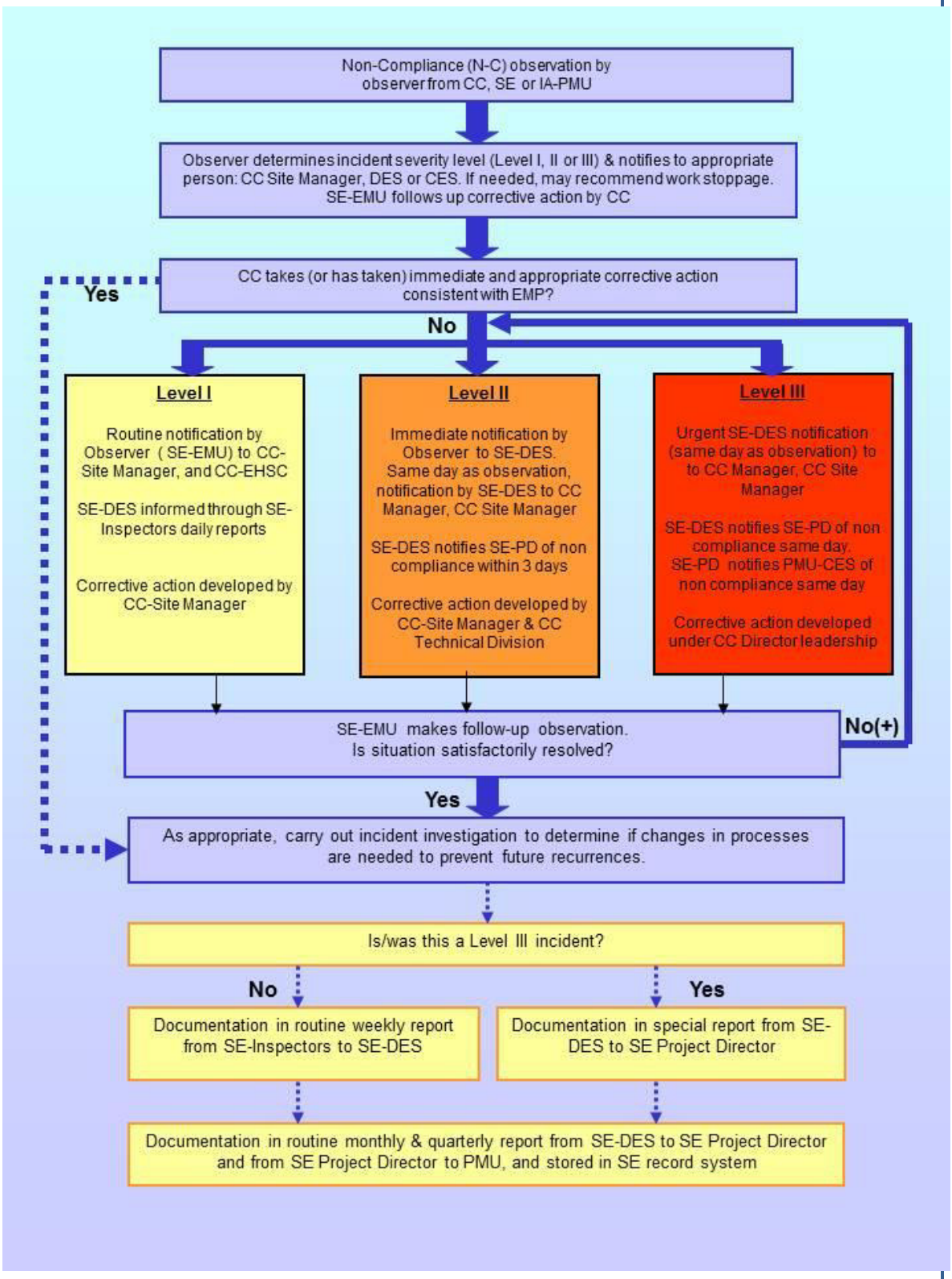
The precise procedures to be put in place will be compliant with the obligations of the Vietnamese Labour Regulations regarding particularly work contract conditions, working time and minimum wages.

9.5. ACTION PLAN PRIOR TO CONSTRUCTION WORKS (PAP)

All the elements described above reflect the main details of the organisation to be set up for supervision and monitoring in the construction phase. However, it is essential to ensure that the necessary means and references are available and totally operational from the time the works start. To this effect, a certain number of activities are to be undertaken before the start of construction works. These actions cover the aspects of recruitment, organisation and training for the PMU, and the performance of a series of complementary investigations aimed at defining the baseline situation more precisely. For these studies, the PMU will call on specialised consultants (either International or National). The main recommended actions, resulting from the EIA are detailed in the following paragraphs in the form of a Preliminary Action Programme (PAP).

The baseline situation is the reference state in comparison with which the project's impacts will be effectively evaluated in the course of construction and operation of the project. Some important aspects of this baseline situation need to be analysed in greater detail before the works are started. Following PAP-01 to 05 are proposed to strengthen the baseline situation knowledge.

Figure [25] DIAGRAM OF PROCEDURES IN CASE OF NON-CONFORMITY OBSERVED



Note: PMU-CES: PMU Chief E&S; SE-DES: Supervision Engineer E&S Director; CC-EHSC: Construction Contractor EHS Coordinator; PD: Project Director (from IA, SE or CC)

9.5.1. PAP-01: Additional Study of Water Quality

The PMU will be responsible for contracting a registered laboratory to perform, during the construction period, air, noise and water quality measurements in compliance with Vietnamese regulations. The first survey of the appointed laboratory will take place as soon as the Project starts, prior to the start of construction works in order to have a reference value against which to evaluate the impact of the construction activities.

The following points will be sampled:

- Cao Rao at its junction with the Le Ky river;
- Nhat Le river at the level of Nhat Le 1 bridge;
- Nhat Le river at the level of Nhat Le 2 bridge.

The following parameters will be measured during this first survey, in accordance with standard QCVN 08: 2008/BTNMT and QCVN 14: 2008/BTNMT:

pH, Total suspended solid (TSS), Dissolved oxygen (DO), COD, BOD_5, NH_4^+, Cl^-, Nitrite (NO_2), F^-, Nitrate (NO_3^-), Phosphate, Cyanide, As, Cd, Pb, Cr^{3+}, Cr^{6+}, Zn, Ni, Fe, Hg, Cu, oil & grease, Coliform.

If necessary, these results will provide an opposable baseline during construction activities.

9.5.2. PAP-02: Appointment of the PMU-CES

The URENCO PMU will appoint its Chief Environment and Social (CES) early enough for this person to contribute to the selection of the Monitoring Laboratory to perform the effect monitoring and the baseline identification (see PAP-01) before construction work starts on the project sites. The CES will be assisted at the beginning of his mandate by the PMSEC who will deliver training to the CES and assist him (i) for the preparation of tenders regarding monitoring surveys, (ii) for the selection of the Consultants, (iii) for the follow-up of the studies.

9.5.3. PAP-03: Training of the PMU-CES and PMU Staff

The PMS-EC will carry out training of the CES and other PMU staff at the early stage of PMU-CES recruitment. Purpose is to have the PMU-CES and his staff fully operational at the start for the project construction. Training will be carried out in Dong Hoi and focus on:

- Review of impact analysis from the IEE
- Review of EMP Program of Action
- Organization for PMU for EMP implementation
- Basics for site inspection: organization of visits, frequency, control checklist;
- Basics for non-compliance process: reporting procedure and form, follow-up, procedure for resolution approval;
- Data management for PMU-CES: data base organization, registers;
- Structure and content of weekly, monthly reports.

9.5.4. PAP-04: Preparation of Communication Instruments

In support and follow up to the public consultations carried out within this PPTA, it is important to prepare the appropriate communication material rapidly, allowing the PMU to present, before starting the works, clear information on the design of the project, on the phasing of construction work, on the recruitment procedures and on the environmental and social measures which will be implemented.

Preparation of proactive communication is indispensable, to ensure the widest possible circulation of information at the most critical time, since it is during this period prior to the start of works, when important decisions and negotiations are in progress, that information on the Project must be available in a completely transparent manner. The communication tools to be developed include:

- flyers and posters;
- articles in the press and radio or TV messages;
- making the technical documents of the EIA available for consultation by any person, at Provincial level and in Districts concerned.

9.5.5. PAP-05: PREPARATION OF THE CONTRACTOR E&S SPECIFICATIONS

Effective consideration of the environment during construction activities presupposes the production of a clear, complete and detailed contractual document at the time the contract is awarded. This means including the specifications which will lay down the environmental and social obligations to be imposed on contractors by the Project Owner in the Tender Documents. These requirements dictated by the Owner will be presented in a document entitled 'Environmental and Social Obligations of the Contractors under the project, which will be prepared together with the Technical Specifications (General and Particular) of the Project. For that purpose, the PMU will request a specialized environmental Consultant to assist the Technical Consultant in charge of the Detailed Design and of the Tender Documentation.

The document will set out the measures that the contractors involved in construction will have to take to comply with the recommendations and measures identified in the course of the EIA and set out in the form of Action Plans. Without being exhaustive, these documents will include the EHS management directives for contractors and the directives concerning the process of classification, investigations and analysis related to the EHS events as well as general clauses concerning the overall incident prevention program for the construction sites.

These obligations will be articulated around the principal themes of environmental and social management for all construction activities related to the project components in Dong Hoi, which will lie down:

- the general specifications for good environmental management which will be applicable to the contractor at any point within the work site and at all times, covering areas such as: training/awareness of employees on protection of the environment, management of hazardous substances and waste, protection of biodiversity, prevention of water and air pollution, preservation of soils, rehabilitation of sites;
- the minimum conditions to be established in the contractors' camps and installations, covering aspects related to housing, catering, waste management, drinking water, sewerage and conditions of public hygiene;
- the minimum conditions to be observed by the contractor in the field of employees' health and safety;
- the minimum conditions to be observed by the contractor with a view to protecting the environment of the sites as well as that of the areas contiguous, most densely urbanized;
- the minimum conditions to be observed by the contractor in managing the social aspects of construction activity; this heading includes in particular the procedure which the contractor will be required to follow in case of damage to any private property.

A specific monitoring program will be set up to ensure that the contractors fulfill their environmental and social obligations, detailed in the following section relating to the Construction Phase.

In practice, the selected contractors will be asked to draw up a number of specific environmental plans, within a specified period of time after the contract is notified, describing how these contractors (and their sub-contractors) will be organised and how they will work together to meet their environmental and social obligations. In principle, the list should cover the following key fields:

1) Solid waste management plan,
2) Dredging and Sediment management plan,
3) Hazardous substances management plan,
4) Accidental spill response plan,
5) Erosion control and sedimentation management plan,
6) Camps management plan,
7) Workers health and safety plan,
8) Air pollution, dust and noise management plan,
9) Road traffic and access management plan,
10) Water quality monitoring plan
11) Cultural resources protection plan,
12) Environmental training plan

9.6. ACTION PLAN DURING CONSTRUCTION (PAC)

This action plan provided below is sufficiently detailed to provide the baseline information for further preparation of Contractor Environmental and Social Specifications to be included later into the Tender documentation.

The following Program of Action will be implemented during the construction phase:

9.6.1. PAC-01: WASTE MANAGEMENT

A waste management programme will be established and will be mandatory for contractors and their sub-contractors. The programme will include two waste management plans which will be prepared and implemented by the contractors following the common directives fixed by the Implementing Agency (URENCO). The first relates to wastes of the domestic type (essentially generated by the camps) and non-hazardous wastes generated on the construction sites, while the second is related to hazardous wastes. The objectives of the programme are:

- to minimize the generation of wastes by carefully considered use of raw materials;
- to sort and treat the wastes in order to limit their environmental impact;
- to raise awareness and train personnel in good waste management practices.

These plans will include procedures, in accordance with local regulations or with international best practice, concerning the handling, transport, storage, treatment and elimination of wastes according to their category:

- **Non-hazardous wastes (Group A)**: putrescible wastes from the camps and canteens, paper, cardboard, plastics, wood and vegetation, inert wastes from construction or demolition (concrete, scrap iron, bricks, breezeblocks, etc.);
- **Hazardous wastes (Group B)**: wastes that are corrosive, explosive, toxic, representing a degree of danger for humans or for the ecosystem. In the context of the present project components considered, this will essentially be engine oils and used hydraulic fluids, the residues of paints, solvents and resins, fluids from transformers, first aid medical wastes, sludge from septic tanks and chemical mobile toilets, various concrete additives (but with a lesser degree of danger for the latter).

9.6.1.1. NON-HAZARDOUS WASTE MANAGEMENT

A system of waste segregation at source, ensuring separation of metal products (including drink cans or food cans), plastic products (bottles, cartons, wrapping, etc.), glass bottles, paper and cardboard, will be set up on the construction sites and in the camps. All these products will, as far as possible, be made available for collection by outside contractors responsible for recycling.

The workers' camp will be provided with two types of covered bins for selective collection of the various products listed above: putrescible in one, for recycling in the other. The contractor will carry out systematic awareness campaigns among residents of the camps to promote efficient use of these refuse bins.

On the construction sites, metal wastes that have not been polluted by hazardous substances (oils, acids, paints, etc.) will be collected in containers for recycling. The same applies to wood and cardboard and plastic packaging. It will be absolutely forbidden to burn plastic or lubricants.

Concrete and plaster debris that is not reused will be collected and dumped with dredged materials from Cau Rao.

The Contractor will prepare a detailed Action Plan indicating the anticipated volumes of non-hazardous waste to be produced, the procedures for management, collection and disposal, the technical means implemented, the location and dimensions of the controlled landfill, the contact details of the companies involved in waste recycling, as well as the training programs to raise awareness among workers on this subject.

9.6.1.2. HAZARDOUS WASTE MANAGEMENT

Sludge from septic tanks will be placed in the basins for treating leachate from the controlled landfill or could be gradually injected into the waste water treatment system of the Operator's village.

Used engine lubricants from the maintenance of construction plant and vehicles and the floating oily residue from oil separators will be collected in 200 litre drums with a view to recycling. The drums will be stored in a dry and covered area, surrounded by a bund the height of which will ensure retention of a volume equal to at least 110% of that of the largest container stored in the area, and equipped with an oil separation system at its outlet. The contractor will identify an acceptable recycling point (refinery) or a plant where the waste can be burned (fuel for industrial use such as a cement factory or metal foundry). A register will be maintained to record all handling of used lubricants, for the purpose of monitoring wastes. Machine and plant maintenance operations will be centralised in appropriate areas allowing collection of the used oils and hydraulic liquids.

Used chemical substances: the principal action to limit the management of used chemical substances is to use ones with low toxicity values and use the minimum quantity of chemical substances required for efficient operation. Used chemical substances will be stored in containers or drums in the same storage areas as used oils, as long as these substances are compatible. Otherwise, they will be stored in a safe area protected from inclement weather. The possibility of reuse in situ will be evaluated; failing this, the materials will be returned to the supplier or to appropriate waste treatment installations.

9.6.2. PAC-02: DREDGING AND SEDIMENT MANAGEMENT

The technical studies (at the stage they have reached at the time of preparation of the present IEE) show that a significant volume of dredged materials will be produced from Cau Rao. Also, other components related to sewerage will produce some spoils from earthworks.

The Contractor(s) in charge of dredging operations will be required to produce a Dredging and Sediment Management Plan which will highlight the sediment management from Cau Rao. The Plan will respect the objectives set out in the Tender Documents which will include:

- Describe methods of dredging/excavation in order to confine suspended sediment and to guarantee water availability for irrigation in quality and quantity terms;;
- Assess total production of sediment expected volume re-usable for fill with anticipated schedule of production;
- Define location and size of areas intended for temporary storage of re-usable sediment for fill;
- Store material in conditions that will ensure security in terms of stability and erosion; to this effect, a maximum height of 6 m should be imposed, with a berm half way up the slope;
- Provide drainage at the foot of the stockpiled material and anti-erosion measures on the slopes;
- Define hauling route to existing disposal site.

9.6.3. PAC-03: HAZARDOUS SUBSTANCES MANAGEMENT

A plan for the management of chemical substances will be prepared by the Contractor, detailing the measures planned for minimising pollution risks. The programme will be applicable to all project activities involving the handling, storage and use of substances catalogued as hazardous. The information set out in this programme will cover the following aspects:

- procedure for registering and monitoring any substance of a hazardous nature including in particular the drafting of a safety data sheet per substance;
- procedure for identification of alternative and less hazardous substances;
- handling and storage conditions, including details on compatibility of the substances;
- emergency procedures in case of a spill;
- conditions for final treatment of residues or recycling.

Chemical substances will be stored in a locked container located on a watertight floor surrounded by a bund, capable of storing at least 110% of the volume of the largest receptacle placed there. Each storage site will be provided with a substance collection pit, absorbent products and extinguishers. Standard signs will warn of the presence of toxic substances.

The substances' safety data sheets will be available on the site and from the CC-EHSC of the contractor concerned. All chemical substances stores will be regularly inspected in order to detect any possible leakage or damage to the containers.

The largest volume of chemical substances anticipated under a project of this type concerns hydrocarbons (diesel, oil and grease). The programme will lay down the conditions to be respected for storage and refuelling of machinery.

The programme will specify the pollution control equipment to be installed by contractors at the storage sites: anti-pollution kits, extinguishers, substance description sheets, etc.

At each site, the employees in charge of handling chemical substances will be given special training relative to best practice and emergency measures in case of an incident (see PAC-04 below).

9.6.4. PAC-04: ACCIDENTAL SPILL PREPAREDNESS AND RESPONSE PLAN

An anti-pollution program will be established to define the intervention procedures in case of leaks or accidental spills of liquid hazardous substances. This programme will include a description of the organisation planned for such situations and the work stations of key people. Specific training will be given for the activities to be performed in case of emergency intervention, for all staff and workers involved in any stage of the procedure.

Spills of less than 200 litres may be managed at the local level by the CC-EHSC present on the site, as representing an environmental event (non-conformity) of Level I. For greater volumes, they will be considered as an EE of Level II and will therefore require consultation of a higher level in the organisation. The authorities and local departments to be advised in case of an emergency at the local and regional level will be identified and informed of the response procedure put in place. Such a situation may occur in case of large accidental spill into the Cao Rao channel which could eventually threat Le Ky and Nhat Le rivers. In order to meet the objectives of this program, a Risk Response Plan will be prepared by the Contractor in conformity with (i) the emergency procedures and the response to major risks which will also be demanded by the Supervision Engineer and (ii) the principles of ISO 14001.

9.6.5. PAC-05: EROSION AND SEDIMENT CONTROL

Erosion control measures will be applied to all land that is stripped or excavated, all embankments and temporary or permanent deposits of materials in order to minimise and control the resulting sediment loads before they reach the storm water drainage and the river. This protection will involve, on one hand, the implementation of methods for stabilising slopes and, on the other, collection of surface water runoff.

Erosion control will include methods that are incorporated into construction practices, as the provision of temporary protection of a mechanical nature (geotextile covering sheets, sediment barriers).

Drainage of the entire area of any construction operations will be provided prior to the start of any other activity. Drained water will be channelled towards one or several sedimentation basins designed following accepted best practice and sized to contain the rainwater falling in 24 hours with a return period of two years.

The contractor will present a Drainage and Erosion and Sedimentation Control Plan setting out the applicable principles and practices adopted for the Project. For each site to be opened for construction activities, a detailed plan of the drainage system and the proposed anti-erosion measures will be prepared by the contractor and submitted to the SE-DES for non-objection at least three weeks before starting works on the site. The drainage channel and sedimentation basins will be built as a priority before any other activity is carried out.

9.6.6. PAC-06: MANAGEMENT OF CAMPS

A permanent and temporary camp management program will be prepared by the contractor responsible. The various aspects covered by such a program will include:

- choice of location for the camp, proposed organization, controlled entry;
- installations proposed for water supply and sewerage, waste management, and drainage of storm water;
- equipment chosen for the sanitary facilities, collective equipment, bedrooms and dormitories;
- the anticipated catering and food supply services, particularly canteens; means for monitoring the quality of foodstuffs stored and distributed in the camp;
- the policies implemented with regard to prevention of drug and alcohol abuse.

The specifications of the Tender Documents will lay down the requirements regarding water supply and sewerage. In order to eliminate the risks of development of disease vectors, rainwater drainage will be provided. The ratios to be respected in terms of sanitation (number of toilets, showers and wash-basins) will also be defined. The standards applicable to bedrooms and their furnishing and fittings will also be detailed in the Tender Documents. In particular, the minimum floor space per person, the supply of impregnated mosquito nets, and mattresses, will be stipulated.

The procedures to ensure hygiene in all common facilities and in particular food hygiene procedures for storing and monitoring fresh products used by the canteens will be detailed by the contractor responsible.

In order to prevent the abuse of drugs and alcohol, measures to raise the awareness of employees and specific control measures will be set up by the contractor responsible.

9.6.7. PAC-07: PUBLIC HEALTH MANAGEMENT PLAN

The program requirements will be described in detail in the Tender Documents and will cover the following main areas of action:

- First aid facilities established on the construction or camp site; hospital facilities available in Dong Hoi ;
- emergency intervention procedures in case of an accident;
- employee surveillance measures: medical check-up on recruitment, annual medical check-up;
- regular cleaning of the drainage system;
- regular cleaning of the sanitary facilities provided, in particular toilets and septic tanks;
- waste management and regular cleaning of refuse bins;
- systematic program to keep employees aware of good hygienic practices;
- monitoring hygiene in canteens;

9.6.8. PAC-08: MANAGEMENT OF AIR QUALITY, DUST AND NOISE

A program to limit atmospheric and noise emissions will be put in place in all areas likely to be affected by construction of the Project, in particular close to the construction sites and along the access roads.

Emissions of exhaust gases and fumes will be limited by the obligations regarding maintenance of construction plant and trucks, and by forbidding the combustion of any waste on the sites.

Dust caused by road traffic on unpaved surfaces will be subject to reduction measures in inhabited areas (close to the workers' camps), by requiring the contractor to water spray the ground at regular intervals, i.e. at least two to four times per day during periods without daily rainfall. All loads of fine materials potentially causing dust to be spread during transport will be covered by a tarpaulin. In storage areas, watering will be recommended for all materials likely to generate dust, in particular during periods of wind (frequent in Dong Hoi).

Noise will be the subject of regular monitoring by the SE-DES to ensure that the limits laid down for the site are respected or that the employees exposed to higher noise levels are appropriately equipped. Measures will be taken to reduce noise levels and the corresponding disturbance on the site and along the access roads: maintenance of plant and vehicles, use of soundproofed equipment, reduction of the hours of use of certain installations (crushing plant, blasting).

The Tender Documents will define the thresholds to be respected by the contractor in terms of gas, dust and noise.

9.6.9. PAC-09: MANAGEMENT OF ROAD TRAFFIC AND ACCESS

Road traffic is the prime cause of accidents during the construction phase of infrastructure projects. It is therefore essential to regulate traffic both on site and outside. This is particularly important for the present project as (i) components are located in urban area and (ii) the projects involve large volumes of excavation and fii which may generate heavy truck traffic. Various measures will be considered and adopted by the contractors:

- awareness-raising and training of drivers of light vehicles and trucks in the rules of elementary caution and on the risks encountered: driving under the influence of alcohol or drugs, excess speed, monitoring tyre wear, placing the load (stability), etc.;
- checking the eyesight of all recruited drivers, and their ability to drive;
- provision of parking places for trucks separate from the roadway next to sites;
- enforcing respect for speed limits;

Access to the construction sites will be indicated by appropriate signage.

The Tender Documents will set out all these obligations as well as the penalties that will be applied to contractors and their sub-contractors in case of infringement.

9.6.10. PAC-10: WATER QUALITY MONITORING (FOR CONTRACTOR)

The contractor will prepare a water quality monitoring plan which will be aimed at highlighting the quality of the environmental management implemented on the sites. This monitoring will verify discharge compliance, in other words it will concern all points where liquid effluents (waste water, drainage water) leave the limits of the work site concerned to enter the natural environment. The contractor concerned will be under the obligation to ensure conformity with the applicable Vietnamese standards.

The contractor will be responsible for monitoring the quality of all discharges leaving its sites or subcontracting a competent consultant or local agency to do so. The parameters will be defined according to the type of discharge and detailed in the Tender Documents:

- discharge of 'grey' water and stormwater drained off the camps;
- discharge of stormwater at the outlet from the sedimentation basins;
- discharge of stormwater drained from the areas for parking and maintenance at the outlet from the oil separators;
- discharge from wastewater in the worker camps.

Sampling sites and parameters may change in the course of construction in order to adapt to the areas of activity and the types of activity observed, most of the project components being linear (roads, long reservoirs being dredged).

The monitoring will be carried out on a monthly frequency.

This monitoring will be supervised by the SE-DES, who will incorporate control measurements at points identical to those surveyed by the contractor into his own water quality monitoring process (see the following section related to monitoring of the sites).

Compliance monitoring will concern at least the following water quality indicators:

- organic pollution: BOD_5, nitrates, phosphates, (particularly related to the camps areas);
- oils and grease, relating to drainage water from the areas used for mechanical activities, storage of hazardous substances (hydrocarbons) and wastewater from canteens;

- suspended solids in drainage water and used also as performance criteria for the dredging activities and for sedimentation basins;

9.6.11. PAC-11: PROTECTION OF CULTURAL RESOURCES

The IEE confirms that the project components are not affecting any cultural site or building. However, as some components involve extensive excavation works, the chance to find any physical cultural resource does exist.

The Tender Documents will define an emergency intervention procedure (chance to find procedure) in case a discovery is made or an interaction is observed during the works. This procedure will include aspects such as:

- immediate measures to stop work at the site concerned and mark out the area to be protected;
- information procedure involving the CC-EHSC, the SE-DES and PMU-CES;
- approval of the measures decided by the CES;
- organization of removal of the resource (if physical);
- closure of the incident and resumption of work.

9.6.12. PAC-12: ENVIRONMENTAL AND SOCIAL TRAINING PLAN

The objective of this plan is to ensure effective implementation of the measures proposed under the EMP on the construction sites. This Plan will define the general training programs (awareness-raising) for the attention of all personnel and the specialized training programs intended for the employees involved in particularly sensitive activities from the environmental standpoint (management and distribution of hydrocarbons, hazardous waste management, etc.). Each new recruit must participate in the awareness-raising program within 10 days following his recruitment. Each employee in charge of sensitive activities will follow a catch-up session every 6 months.

This training will be delivered by the CC-EHSC of the main Contractors or by a specialized consultant appointed by the contractors. All personnel will be trained. The sessions will be recorded in a register where the names of all participants will be noted.

The environmental management awareness program on the sites will cover the following priority subjects:

- the rules for waste management within the sites;
- the rules for management of hazardous substances and wastes, particularly their storage authorized exclusively in specially adapted areas;
- pollution control, in particular the response required in case of an accidental pollutant spill;
- protection of sites against fire;
- protection of sites against erosion and sedimentation;
- the procedure to follow in case of discovery of a physical cultural resource;
- the traffic safety rules on public roads and within the sites;
- the principles for saving energy and other resources;
- applicable penalties in case of infringement against the established rules.

Complementary provisions will be made relating to hygiene, health and safety under all aspects that are not covered by the Health and Safety Program and the corresponding training programs.

9.7. E&S SUPERVISION DURING CONSTRUCTION

The Supervision Engineer, through its DES and his team, is responsible for ensuring the Contractor complies with its E&S obligations. The SE is the one that certifies payments to the contractor and as such, he can therefore 'negotiate' the deployment of plant or labour initially allocated to the works in favour of specifically environmental measures.

9.7.1. PAC-13: MONITORING OF CONSTRUCTION ACTIVITIES (SUPERVISION ENGINEER)

Contractors' compliance with their environmental and social obligations will be the subject of a specific monitoring process, coordinated by the SE-DES. In order to ensure compliance with E&S requirements and efficient implementation of corrective measures an environmental monitoring program will be set up, including:

- E&S supervision of the contractors: Through regular site inspections the objective is to ensure that all E&S measures set out in the Obligations for Contractors and in the Action Plans prepared by the Contractors are effectively and efficiently implemented;
- Environmental quality monitoring: monitoring of changes in the quality of the environment in order to evaluate the efficiency of the mitigation measures applied and, if necessary, to modify acceptability thresholds or methods;
- Environmental compliance control monitoring: ensuring that all discharges from all project sites are compliant with environmental legislation or with related specifications in the Tender Documents (under the responsibility of the Contractor, see PAC-10 above). This monitoring will also confirm or not the validity of information supplied by the CCs on a monthly basis. Analysis will be performed on a limited number of parameters indicators of pollution from construction activities.

9.7.1.1. WEEKLY INSPECTIONS

Weekly inspection of the different work sites will be organised by the SE-DES and will be the subject of a report using a standard inspection sheet. This information sheet will check all the environmental specifications imposed on the contractor item by item, giving an immediate overview, during each inspection, of potential cases of non-conformity.

Each environmental event (EE) will be the subject of a standard record sheet to be filled in by the observer (Inspector) and submitted to the SE-DES for action. The record sheet signed by the SE-DES is handed over to the CC-EHSC who then completes the document by explaining the proposed corrective measure. If the solution is acceptable, the EE is closed after checking that the measure has been effectively and successfully implemented.

9.7.1.2. COORDINATION MEETINGS

Regular (weekly or semi-monthly) coordination meetings will be held between the CC-EHSCs (and their inspectors) and the SE-DES (and his inspectors), during which they will discuss the EE in progress, the remedial measures taken and any other subject of current concern such as the Action Plans presented by the CC-EHSCs.

9.7.2. PAC-14: AIR QUALITY AND NOISE MONITORING (SUPERVISION ENGINEER)

The most crucial problems will be caused by dust near the construction sites. No significant problem is seriously anticipated with exhaust emissions, except very locally along hauling routes.

There will be two types of sampling monitoring under the responsibility of the SE:

- ad-hoc controls for dust in residential areas at the boundaries of construction sites near residential areas and along the hauling routes used between the sites. Action will be taken as soon as few complaints from residents have been collected for a particular location, or where visual inspection confirms that excessive dust is being generated. The DES will make spot

checks of noise levels on the various work sites and in certain residential areas during daytime and night, in order to check that standards applicable within the boundaries of the work sites or in the surrounding residential areas are respected.

- regular monitoring for air quality and noise carried out by an external registered laboratory on a quarterly basis. Locations may vary according to progressive transfer of activities, particularly for the road works. Proposed Monitoring Plan is detailed in the table below.

Table [26] ENVIRONMENTAL EFFECTS MONITORING PLAN FOR CONSTRUCTION PERIOD

REFERENCE	PARAMETERS	LOCATIONS	FREQUENCY
Ambient air quality compared to criteria in QCVN 05:2009/BTNMT	CO, SO_2, NO_x, TSP, O_3, lead dust (Pb), (PM10), (PM2.5), benzene, petroleum hydrocarbon (HC)	3 sites: 1: Bao Ninh riverside road 2: Dong Hoi WW construction site 3: Bao Ninh WW contruction site	Quarterly
Noise level compared to criteria in QCVN 26:2010/BTNMT	Day time and night time noise levels dB(A)	3 sites: 1: Bao Ninh riverside road 2: Dong Hoi WW construction site 3: Bao Ninh WW contruction site	Quarterly

For the quarterly monitoring of air quality, the SE will appoint a registered professional laboratory to perform the task.

9.7.3. PAC-15: WATER QUALITY MONITORING (SUPERVISION ENGINEER)

The Contractor is imposed to carry out a monthly monitoring of all the effluent leaving its construction and camps premises. In addition, the SE will appoint a registered professional laboratory to carry out an independent monitoring of surface and underground water quality on a quarterly basis.

Proposed monitoring criteria and locations are presented in the following table.

Table [27] ENVIRONMENTAL EFFECTS MONITORING PLAN FOR CONSTRUCTION PERIOD

REFERENCE	PARAMETERS	LOCATIONS	FREQUENCY
Surface Water Quality compared to criteria in QCVN 08:2008/BTNMT	pH, DO, TSS, COD, BOD5, NH4, Cl, NO2, NO3, F, Phosphate, Cyanide, As, Cd, Pb, Cr+3, Cr+6, Zn, Nickel, Fe, Hg, Cu, Coliforms	3 sites: 1: Outlet Cau Rao in Le Ky 2: Nhat Le river at bridge 1 3: Nhat Le at bridge 2	Quarterly
Underground Water Quality compared to criteria in QCVN 09:2008/BTNMT	heavy metals (As, Cr, Cd, Cu, Pb, Zn, Ni, Hg, Fe, Mn, Se), , VOC, TPH, Coliforms	3 sites 1: Well in WW project area in Dong Hoi 2: Well in WW project area in Phu Hai 3: Well in Bao Ninh	Quarterly

9.7.4. PAC-16: SITE CLEANING AND REHABILITATION PROGRAM

By the end of the construction activities, each contractor has to decommission the sites where its activities for Project needs have been performed, which includes:

- The demolishing of all structures/buildings developed for the purpose of Project construction.
- The removal from the site of all equipment and the safe disposal or recycling of construction and demolition waste and of construction material;
- The restoration of the land in order to restore it as close as possible from the initial state,
- The official handover of the site to its owner, signed by parties.

In order to ensure that this Site Cleaning and Rehabilitation (SCR) operation is successfully implemented, the Contractor will be required to prepare a Site Cleaning and Rehabilitation Plan (SCRP) which provides operational methods for (i) site assessment and (ii) cleaning and

rehabilitation in compliance with Contractual obligation and international good practices. The Plan will respect the following:

Cleaning Stage

- All construction materials, equipment, buildings, facilities and residual waste will be removed from all sites, except if a site specific decision modifies this principle. This decision shall be, commonly agreed on by the CC, PMU and CPC.
- All waste collected on site will be treated in compliance with the requirements of the Tender Documents Environmental Obligations and the Waste Management Plan prepared by the CC at the start of the construction, depending on the classification of the waste product considered.
- Recycling of waste will be maximized.

The Plan will be submitted to the SE not later than 1 month before the start of decommissioning and include the methods for carrying out the following activities:

Identification of Materials and Waste existing on the site: Usable construction surplus, usable hazardous materials surplus, demolition and inert waste (wood, iron sheet, metal scrap, PVC and plastics, glass, tires, etc.), organic waste, hazardous waste, broken machineries etc.

- Evaluation of quantities regarding each group of materials/waste identified;
- Identification of registered companies for the recycling of materials and waste;
- Procedures for treatment and disposal of non-recycled material and waste;
- Schedule for cleaning operations;

Rehabilitation Stage

Rehabilitation will be carried out in immediate continuation or even in parallel with the cleaning stage, taking advantage of the presence of the manpower and the equipment. Consultation with concerned stakeholders will be carried out where necessary. The following principles will apply:

- Sites shall be rehabilitated in a way to restore, as much as feasible and reasonably possible, the original use of the land;
- All sites must be returned free of any buildings or infrastructures developed for the purpose of Project construction, except if specific request is made;
- All spoil disposal areas shall be rehabilitated according to the obligations of the Tender Documentation and the obligations of the Plan on Sediment and Spoil Management.
- Rehabilitation option will eventually be selected through consultation between CC, SE, CPC and any private party if the land is privately owned.

After completion of SCR works, the CC will inform the SE-DES regarding the final site status. After acceptance by SE-DES of the site conditions URENCO-PMU will be notified. To finalize the SCR process a joint site visit with all concerned parties will be organized by the SE-DES to sign SCR Completion Certificates as follows:

- For public land, the SCR Completion Certificate will be signed by SE, PMU and by CPC as witness;
- For private land, the SCR Completion Certificate will be signed by the land owner, CC, SE and PMU.

9.8. ACTION PLAN FOR OPERATION STAGE (PAE)

The implementation of environmental monitoring is necessary from the time the works are completed and commissioned, in order to ensure impacts and mitigation measures proposed have been efficiently implemented during the construction stage and show positive results as expected.

The start of the operation stage will vary depend the project components considered. The total project duration will be 5 years, but most of construction activities will start at the end of year 1 and be completed by the end of year 4. Year 5 of the project can be considered as the first year of the operation stage.

The following activities are proposed in this EMP.

9.8.1. PAE-01: AIR QUALITY AND NOISE MONITORING

Monitoring of air quality in Bao Ninh along access road to Nhat Le bridge 2 which should be operational since 2015, will continue over a year after roads completion, in order to appreciate any changes regarding dust and air pollution. Same parameters and location than those monitored during construction will be kept for year 5.

9.8.2. PAE-02: MONITORING OF WATER QUALITY

Monitoring of water quality will continue the last year. Same parameters and location than those monitored during construction will be kept for year 5.

9.9. ENVIRONMENTAL MONITORING & REPORTING

9.9.1. ENVIRONMENTAL MONITORING

Environmental monitoring will consist of environmental effects monitoring as described previously. Environmental effects monitoring will cover ambient air quality, noise and vibration levels, groundwater quality, surface water quality and community and workers' health and safety prior to construction, during construction and/or during operation. A draft Environmental Monitoring Plan is presented in Tables 29 and 30 above.

9.9.2. REPORTING

Environmental monitoring activities and findings shall be documented for purposes of reporting, recording, verifying, referring on and evaluating the environmental performance of the Subproject. The documentation shall also be used as basis in correcting and enhancing further environmental mitigation and monitoring. An Environmental Monitoring Report (EMR) shall not only report on the progress and results of environmental monitoring and compliance of EMP implementation but shall also: (i) assess the effectiveness, of instituted measures; (ii) point out violation/s, if any; (iii) assess/recommend corrective actions; and (iv) cite any coordination made for corrective actions and, if applicable, certifications for having instituted them effectively. A draft EMR outline is presented in Appendix C. The EMR will be provided on a quarterly basis for the first two years and thereafter every 6 months.

9.10. COST OF ENVIRONMENTAL IMPACT PREVENTION, MITIGATION & MONITORING

The following table sets out the estimated budgets required for implementation of the corrective measures and monitoring activities during the 3 phases of implementation of the Dong Hoi Urban Environment and Climate Change Adaptation Project.

Table [28] EMP LIST OF ACTIONS AND BUDGET

NO	CORRECTIVE MEASURE / ACTION	RESPONSIBILITY		DURATION OF IMPLEMENTATION (MONTHS)	BUDGET (US$)
		FUNDING	IMPLEMENTATION		TOTAL
Program of Action Preliminary to Construction Start (PAP)					30,500
PAP 01	Additional Study of Water Quality	PMU	Laboratory	12	5,000
PAP-02	Appointment of PMU-CES	PMU	PMU	60	(1)
PAP-03	Training of PMU-CES & PMU staff	PMU	PMSC	0,5	12,500
PAP 04	Preparation of Communication instruments	PMU	PMSC	0,5	8,000
PAP-05	Preparation of Contractor E&S specifications	PMU	PMSC	0,5	5,000
Program of Actions in Construction Phase (PAC)					188,000
PAC-01	Waste Management	Contractor	Contractor	60	(2)
PAC-02	Management of Sediment and Spoil	Contractor	Contractor	60	(2)
PAC-03	Hazardous Substances Management	Contractor	Contractor	60	(2)
PAC-04	Accidental Spill Preparedness and Response	Contractor	Contractor	60	(2)
PAC-05	Erosion and Sediment Control	Contractor	Contractor	60	(2)
PAC-06	Management of Permanent & Temporary Camps	Contractor	Contractor	60	(2)
PAC-07	Public Health Management	Contractor	Contractor	60	(2)
PAC-08	Management of Air Quality, Dust and Noise	Contractor	Contractor	60	(2)
PAC-09	Management of Road Traffic and Access	Contractor	Contractor	60	(2)
PAC-10	Monitoring of Water Quality (by SE)	Contractor	SE/Laboratory	60	(2)
PAC-11	Protection of Cultural Resources	Contractor	Contractor	60	(2)
PAC-12	Environmental & Social Training Plan	Contractor	Contractor	60	(2)
PAC-13	Monitoring of Construction Activities	PMU	SE	60	150,000
PAC-14	Air Quality & Noise Monitoring (SE)	PMU	SE	48	23,000
PAC-15	Water Quality Monitoring (SE)	PMU	SE	48	15,000
PAC-16	Site Cleaning & Rehabilitation Program	Contractor	Contractor	12	(2)
Operational Phase Action Programme (PAE)					10,600
PAE-01	Monitoring of Air Quality and Noise	PMU	SE	1	5,600
PAE-02	Monitoring of Water Quality	PMU	SE	1	5,000
	TOTAL	-	-	-	229,100
	Contingencies 20%	-	-	-	45,900
	TOTAL	-	-	-	275,000

Notes: (1) Budget internal to PMU operation costs
(2) Related E&S expenses are included into construction costs of the CCs
(3) SE-DES appointed for 5 years
Abbreviations: PMU: Project Management Unit; PMSC: Project Management Support Consultant; SE: Supervision Engineer; CC: Construction Contractor

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10. CONCLUSIONS & RECOMMENDATIONS

The sub-components of the Urban Environment and Climate Change Adaptation Project selected for Asian Development Bank financing will significantly improve the environmental conditions and quality of life of the population in Dong Hoi through the following results:

- Improvement of the wastewater management for Dong Hoi through complementing the WB on-going project with secondary and tertiary networks; direct benefits are related to (i) improvement of quality of life in the central part of the city, (ii) improvement of public health conditions and (iii) reduction of pollution loads to surface water and underground water.
- Promotion of sustainable urban development for Bao Ninh peninsula in the respect of existing natural resources and hazards;
- Promotion of coastal dune system restoration and rehabilitation with direct benefits related (i) to better protection against natural extreme events (typhoon, flooding from the sea) and (ii) to improvement of biodiversity, both vegetal and animal;
- Reduction of anticipated impacts on land acquisition and involuntary resettlement by revising the road development strategy;
- Promotion of sustainable urban drainage strategy (SUDS) based on maximization of drainage water infiltration with direct benefits (i) on reduction of stormwater drainage investment, (ii) reduction of pollution load to the Nhat Le river and (iii) limiting underground penetration of sea water;
- Contribution to long term economic development of Dong Hoi through the development of new urban areas on Bao Ninh taking due consideration of prevailing climate change risks (sea level rise and flooding) and direct effects on the quality of life of future residents and tourists.

A screening carried out during the Interim phase of the Project confirmed that impacts raised by the project were mainly related to land acquisition while impacts on natural environment were all limited, mainly related to the construction phase and easily controlable by appropriate and conventional mitigation measures. Consequently, the proposed categorisation of the Project was B, involving the preparation of the present IEE.

In general, impacts related to project location will be mainly social and related to land acquisition but contrasted depending the areas concerned. Dong Hoi wastewater sub-component will not involve any impact regarding land acquisition or resettlement. The sewerage component for the commune of Phu Hai will impact 49 households mainly for minimal land acquisition or fence destruction (401 m² of land shared by 49 households); no building demolition or physical displacement is anticipated.

In Bao Ninh the wastewater component will involve the acquisition of 7,779 m² (0.78 ha) of private land affecting 71 households; no building demolition or physical displacement is anticipated. The proposed new urban development and associated stormwater system will concern 16.28 ha of open land including 1.98 ha of ancient graveyards. All the land required is public, belonging to the CPC. No private land acquisition or building demolition is required. A site for the relocation of the graveyards has already been made available by CPC.

Impacts from the road improvement project in Bao Ninh have been drastically reduced by the PPTA team during the mid-term mission from the initial project design which involved more than 200 households most of which requiring physical displacement. The selected road improvement project will affect only 122 households with impacts relating only to land acquisition/grave relocation.

Impact on natural resources will be limited to the cut of few roadside trees during wastewater sub-component implementation in Dong Hoi. A 1 to 1 replacement policy will be respected. In Bao Ninh future urban development will involve the loss of about 2,000 Casuarina trees (planted species) growing on the landward side of the coastal dune. This loss will be compensated by the

development of large green areas already included in the development plan and by the re-vegetation of the dune within the dune restoration and protection component of the project.

Main environmental impacts will happen during the construction activities. Because of project components located in an urban environment (particularly the wastewater component in Dong Hoi) risk of nuisances is higher with traffic congestion, temporary alienation of access, community facilities temporary disruption, noise, engine gas and dust release which may temporary disturb the nearby communities. However, recommendations formulated in the EMP combined with a solid environmental contractual framework and an effective inspection of construction sites will definitely reduce these risks to an acceptable level.

For Bao Ninh stormwater component, the PPTA proposed to rely on SUDS (Sustainable Urban Drainage System) rather than the conventional system initially proposed. A SUDS favors the natural infiltration of water into the ground. Direct benefits include (i) reduction of transfer infrastructures investments, (ii) reduction of pollution load to Nhat Le river and (iii) recharge of the coastal aquifer which limits the penetration of sea water.

The restoration of the coastal dune will improve the protection of the new urban development against sand transport by the wind and against the flooding risk from the sea. Coastal erosion will also be reduced, preserving the beaches and supporting the sustainable development of tourism in Bao Ninh.

No particular impacts, except the benefits listed above, are anticipated after the construction of the project components and during their operation. The road traffic will obviously increase in Bao Ninh thanks to urban development and to Nhat Le 2 bridge, but with limited impacts for the residents as the main roads are no longer crossing the villages as they do today and these existing roads have not been widened.

Due diligence of EIAs was carried out as part of this IEE for 2 associated facilities to the proposed project: The Duc Ninh WWTP and the Nhat Le 2 bridge, both being under construction. No major issue rose from the environmental point of view.

The IEE provides a full EMP providing organization, roles and responsibilities of parties involved, detailed measures to implement during construction and operation, monitoring and cost estimate.

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APPENDIX 1
INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

Community Consultations in Dong Hoi

Location	Date	Participant	Summary of people's opinions
1. Phu Hai Ward, Dong Hoi city	14/9/2013	04 Commune leaders and 29 people (22 Male and 7 Female)	- Expected the project will install drainage pipe with about 2km in length along NH 1A, and go through the wards, it's too short and not ensure to drainage for this area. Phu Hai ward located in lowest area and has been flooded when it rains. - According to the Ward, the expanding of NH1A project had planned to expand the existing road up to 32m in width (each side of the road expands to 16m). Currently the project is implementing and is carrying out payment of compensation for site clearance within the line width of 24.5 m, and is not carrying out payment for site clearance within the width of 7.5m. The ward doesn't know size of pipe and also doesn't know the project will put together or separate pipe to the drainage system of the road. - The project organized public consultation very well. This public consultation will contribute to the success of the project. - If the project only carry out digging and installing drainage pipe type Φ=350cm, land acquisition and impact on local people is negligible. The project with main impacts on business for households near roads. Recommend that the project compensate for households with revenue of 6 months to 1 year or support to change job. - Recommend that the project notify people on commence date and time of construction before implementing. The project should have Supervision Agency and it's best to leveling after digging of road. It should consider construction plans to minimize impacts on houses of households. - Recommend that the project have construction plan to minimize dust, noise and mud for people.
2. Bao Ninh Commune, Dong Hoi city	15/9/2013	03 Commune leaders and 49 people (34 Male and 15 Female)	- Currently Dong Hoi city is planning Bao Ninh commune become a sea tourism place. In the commune there are now a lot of investment projects. However, commune also need to consider the specific benefits of each project for households before implementing. - The economic structure of Bao Ninh commune includes 65% fishing, 5% agriculture, and 30% seafood processing and other travel services. Therefore, the project should orient people to develop travel services as the economics restructuring of the local. Sauce making and squid drying should be focused to develop more. It needs to have some classes to train how to make souvenirs. Some logistics for fisheries trade should be developed, such as ice making, marinated fishes... 1) Developing tourism handicrafts 2) Seafood processing (fish sauce, salted shredded fish, and standard fresh seafood) to take advantage of raw material from 4.5 to 5 thousand tons / year. 3) Developing agriculture products with high quality and building the brand such as fresh vegetable, etc. 4) Training on food hygiene and safety for all owners of food service store along the embankment.

Location	Date	Participant	Summary of people's opinions
			5) Training tourist guides - Recommend: The project and leaders of Dong Hoi city authorities should consider to assistance policies as well as adequate compensation price framework for affected households. In case of households would be affected on residential land and resettlement requirement, CPC will be planned resettlement sites for Urban environment and climate change adaptation project at Sa Dong and Ha Duong village. Currently the commune arranged a resettlement site for Nhat Le 2 Bridge Project, there are 81 plots and type of plots from 250 m2 to 400m2. - Affected households request CPC and the project to arrange resettlement for them at the same village if they have to relocate. Because it's so difficult for fishermen if they have to relocate far from existing residence. With seafarers, closer to the river better, the project of expanding horizontal roads is suitable and convenient for fishermen. - Relocation for dead people: Cemeteries currently overloaded. CPC has been planned expansion to the north with a total area of 30ha in Cua Phu Hamlet. Request the project to invest into infrastructure of cemetery if the graves of project would be moved to this cemetery. Relocation for graves of households can be carried out at a time of year, different from northern people only move at the end of year. - Man laborers work as fisherman and woman laborers work fishing net. The project can support on loans for households to retrofit vessels in order to serve the offshore fishing. The fishing households are often away from home. Every year fishery workers transferred to service sector. - Some households request the project to provide reasonable compensation, if not, they don't hand over sites and move. Especially, some households with new and nice house don't want to move. - Request the project to clearly inform people about commence date of each construction item and how long to construct. - Thank Communist Party, Government and Provincial authority for investing and making the better change in Bao Ninh commune than previous years, especially than when not yet Nhat Le 1 Bridge. Most of households support to implement the project because the project will improve the environment, flood protection, anti-sand and water supply and drainage. However, households request the project to provide reasonable compensation and facilitate to stabilize their lives. - Request the project to provide clean water for Bao Ninh commune and focus on Sa Dong village. - There are many single women and her husband work as fishermen away from home for long in the commune. Request the project to provide assistance for single women.

LIST OF PARTICIPANTS

PHU HAI WARD

#	Full name	Commune	Male	Female
1.	Hoàng Xuân Tùng	Phú Hải Ward	x	
2.	Phạm Hồng Phong	Phú Hải Ward	x	
3.	Đoàn Xuân Dạ	Phú Hải Ward	x	
4.	Nguyễn Văn Khanh	Phú Hải Ward	x	
5.	Lê Văn Quê	Phú Hải Ward	x	
6.	Trương Cộng Đồng	Phú Hải Ward	x	
7.	Lê Thị Hồng Vân	Phú Hải Ward		x
8.	Trương Thị Bảy	Phú Hải Ward		x
9.	Nguyễn Thế Sơn	Phú Hải Ward	x	
10.	Hoàng Lạc	Phú Hải Ward	x	
11.	Đặng Huy Trường	Phú Hải Ward	x	
12.	Võ Thanh Hoài	Phú Hải Ward	x	
13.	Phan Đình Quân	Phú Hải Ward	x	
14.	Ngo Thị Hà	Phú Hải Ward		x
15.	Hoàng Văn Dũng	Phú Hải Ward	x	
16.	Hoàng Thế Hơn	Phú Hải Ward	x	
17.	Bùi Văn Nghi	Phú Hải Ward	x	
18.	Nguyễn Thị Thu	Phú Hải Ward		x
19.	Hoàng Trung Thông	Phú Hải Ward	x	
20.	Nguyễn Khắc Thơm	Phú Hải Ward	x	
21.	Võ Văn Huy	Phú Hải Ward	x	
22.	Trần Đình Khoa	Phú Hải Ward	x	
23.	Lê Văn Minh	Phú Hải Ward	x	
24.	Nguyễn Thị Tuyết	Phú Hải Ward		x
25.	Phạm Thị Minh Tuấn	Phú Hải Ward		x
26.	Nguyễn Văn Diêu	Phú Hải Ward	x	

BAO NINH COMMUNE

#	Full name	Commune	Male	Female
1	Đào Thị Lợi	Bảo Ninh		x
2	Võ Văn Hậu	Bảo Ninh	x	
3	Nguyễn Văn Dần	Bảo Ninh	x	
4	Bùi Đức Tỉnh	Bảo Ninh	x	
5	Hoàng Thị Hồng	Bảo Ninh		x
6	Hoàng Quang Tuệ	Bảo Ninh	x	
7	Trần Quang Huy	Bảo Ninh	x	
8	Phạm Ngọc Thành	Bảo Ninh	x	
9	Nguyễn Thanh Bình	Bảo Ninh	x	
10	Đào Khánh	Bảo Ninh	x	
11	Lại Tấn Tài	Bảo Ninh	x	
12	Lại Minh Thành	Bảo Ninh	x	
13	Hoàng Quang Thuyết	Bảo Ninh	x	
14	Nguyễn Thuận	Bảo Ninh	x	
15	Trương Kiều Hưng	Bảo Ninh	x	
16	Trương Thị Hồng	Bảo Ninh		x
17	Lê Thị Hà	Bảo Ninh		x
18	Đỗ Thị Hồng	Bảo Ninh		x
19	Mai Minh	Bảo Ninh	x	
20	Trương Thị Năm	Bảo Ninh		x
21	Trần Thị Bông	Bảo Ninh		x
22	Hồ Thị Vinh	Bảo Ninh		x
23	Nguyễn Thanh	Bảo Ninh	x	
24	Hoàng Trung Năm	Bảo Ninh	x	
25	Trương Văn Sáu	Bảo Ninh	x	
26	Lại Thị Lai	Bảo Ninh		x
27	Đào Xuân Giỏi	Bảo Ninh	x	
28	Trương Thị Bến	Bảo Ninh		x
29	Hồ Quý Ly	Bảo Ninh	x	
30	Phan Phú	Bảo Ninh	x	
31	Đỗ Thị Cúc	Bảo Ninh		x
32	Nguyễn Thị Gái	Bảo Ninh		x
33	Trương Phương Xa	Bảo Ninh	x	

#	Full name	Commune	Male	Female
34	Nguyễn Thị Diêm	Bảo Ninh		x
35	Nguyễn Thị Ninh	Bảo Ninh		x
36	Luu Thị Vy	Bảo Ninh		x
37	Trương Vi	Bảo Ninh	x	
38	Hoàng Sơn	Bảo Ninh	x	
39	Lại Minh Tu	Bảo Ninh	x	
40	Lại Tuấn Hưng	Bảo Ninh	x	
41	Nguyễn Thị Hải	Bảo Ninh		x

PUBLIC CONSULTATION IN PHU HAI WARD

FOCUS GROUP DISCUSSION IN BAO NINH COMMUNE

The attendance lists from the different public consultations are provided in the following pages.

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APPENDIX 2
DUE DILIGENCE OF ASSOCIATED FACILITIES

ASSOCIATED FACILITY (LINKED PROJECT) 1: DUC NINH WASTEWATER TREATMENT PLANT

EIA OF DUC NINH WASTEWATER TREATMENT PLANT (WWTP)

Name of the Project: " Dong Hoi City Environmental Sanitation Project – Phase 2 "

The "Dong Hoi City Environmental Sanitation Project" is a part of the "Coastal Cities Environmental Sanitation Project: Dong Hoi, Qui Nhon and Nha Trang" which has been commenced since 2004 with the purpose of upgrading environmental sanitation condition for Dong Hoi City through a credit from the World Bank (WB)

Project Owner: Project Management Unit of Dong Hoi City Environmental Sanitation Project

Consultant for EIA Preparation : INFRA Thang Long Company

Guideline used EIA preparation: EA is written in accordance with WB Operational Policies 4.01 (Environmental Assessment) and Cultural assets (OP 4.11) as well as Vietnamese legislations on environmental protection.

Date of EIA Completion :June 2009

The EIA was Approved by Quang Binh Province People Committee, in March 2010, Decision No 547/QD-UBND.

COMPARISON OF ADB SPS (2009) PROVISIONS AND POLICIES/GUIDELINES ADOPTED IN THE LINKED PROJECT AND ENVIRONMENTAL PERFORMANCE REVIEW OF THE PROJECT

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
Environmental Safeguards			
1. Use a screening process as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	Yes .	OP 4.01 - Environmental Assessment OP 4.11 Cultural assets	ADB SPS (2009) Use a Environmental Screening /Rapid Environmental Assessment Guidelines Adopted in the Project OP 4.01 - Environmental Assessment The Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of EA. The Bank classifies the proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. Environmental Screening in Duc Ninh WWTP Subproject –Dong Hoi The Subproject is classified as environmental category A EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance Selection of location of Duc Ninh WWT is disclosed publically in Duc Ninh Commune PC in Dec, 26, 2009 (included The meeting minute)
2. Conduct an environmental assessment to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.	Yes	*Government Regulation* Law on Environmental Protection, 2005 (LEP) Decree 80/ND-CP, August 09, 2006, of the Prime Minister regarding detailed stipulation and guidance on applying the Law of Environmental Protection. Decree 21/2008/ND-CP, February, 28, 2008, amending and supplementing a number of articles of the Government's Decree 80/ND-CP of August 9, 2006; detailing and guiding the implementation of a number of articles of the Law on Environmental Protection. Circular No. 05/2008/TT-BTNMT guiding strategic environmental	Duc Ninh WWTP' EIA The EIA prepared by Centre of Environmental Measurement & Analysis of Quang Nam Province that the Owner hired The Centre for EIA Chapter 4 in EIA : Environmental Impact Assessment included 3 stages Pre Construction Phase Impact due to land acquisition, site clearance and compensation During Construction Phase Waste generating from the construction phase Dust and Air pollution Wastewater Solid waste Impact due to noise Traffic obstruction Impact on drainage system, irrigating canal and dike Impacts on electricity, water supply and other services

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
		assessment, environmental impact assessment and environmental protection commitment Biodiversity Law No 20/2008/QH12 Environmental Standards of the State of Vietnam for 1995 – 2005 period; *World Bank safeguard policies* OP 4.01 - Environmental Assessment OP 4.11 Cultural assets	impacts on socio-economy Operation Phase Assessment of Nhat le river ability to receive wastwater from Dong Hoi city In addition, Environmental assessment indentified "Risk Impact & Emergency " as fire risk, the WWTP operation risk, Natural Disaster & Flooding , Chemicals leakage Small difference Gender issues & Vulnerable groups , climate change are still not considered in the EIA
3. Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	Yes	Circular No. 05/2008/TT-BTNMT OP 4.01 - Environmental Assessment	Duc Ninh WWTP' EIA Chapter 5 in the EIA : Alternative of the project This chapter indicated if the Dong Hoi City Environmental Sanitation Subproject – Phase 2 project not be done , flooding situations will bring the disadvantages as Destroy road system and cause traffic jam. Waste water will cause diseases and affect the environment and public health. Cause loss and damages and create instability for public utilities System of urban regulated ponds is overload, affecting aesthetic aspect and the environment.
4. Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.	Yes		EMP in EIA of Dong Hoi City's WWTP EMP included *Environmental Management Program* : A matrix indicated project activities , potential impacts caused by the project, mitigation measures, Who have responsibility to carry out in 3 stages: Pre-construction. During construction, Operation stage *Environmental Monitoring Measurement Program :* included : Project performance indicators Contractor compliance to impact mitigation measures. Flooding situation Wastewater and environment sanitation Community stakeholder participation Monitoring implementation of mitigation measures Environmental Monitoring Program The environmental monitoring program is carried out during 3 phases of the project: Pre-construction (planned to be before construction activities), construction (planned to be in 2 years), operation phases (planned to be in the first year of operation). A matrix of Environmental Monitoring Program indicated Potential impacts caused by the project, Monitoring indicators, monitoring method, location & frequency

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
			Pre-construction Land acquisition Compensation *During construction* Location of work camps and site services Construction material waste Road vehicles - Maximum permitted emission limits of exhaust gas TCVN-6438-2001 Soil erosion Dust & noise Labour safety Roads for material transportation & disposal of solid waste Discovery of archaeological, religious and cultural relics Domestic solid waste Domestic wastewater *During Post-construction/Operation stage* To ensure households to be connected by wastewater collection network Connection with households Surface water quality of Drainage system, wastewater collection Sludge monitoring measurement Each element monitoring measurement included : Locations, Parameters, frequency, National Standards , and total estimated cost for whole Environmental Monitoring measurement program *Project organization for environmental management* *. Capacity development and training*
5. Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.	Yes	Decree 80/ND-CP, August 09, 2006, Decree 21/2008/ND-CP Circular No. 05/2008/TT-BTNMT OP 4.01 - Environmental Assessment	Full Equivalence Commune, ward or township Fatherland Front Committees shall represent communities in contributing opinions in the process of making environmental impact assessment reports of investment projects in their localities. The project owner shall send a document on the project's major investment items, environmental issues and environmental protection measures and request the commune-level People's Committee and Fatherland Front Committee of the place where the project is to be executed to give opinions. Within fifteen (15) working days after receiving a written request for opinions, commune-level People's Committee and Fatherland Front Committee shall give their opinions in writing and make them public to local people. Small difference There are no provisions in the legal framework that are explicitly intended to ensure women's consultation in the EA process.

SPS Policy Principles	Was Similar Principle Used in the Project? (Yes, No, Not applicable)	Specific Guidelines (i.e. decree, circular or office order/instruction) Used In the Project	Description of Equivalence / Difference and Environmental Performance Review
			Public Consultation in EIA of Duc Ninh WWTP in Dong Hoi City's City The project owner sent The EIA to Duc Ninh Commune People's Committee and Fatherland Front Committee of the place where the project is to be executed to give opinions; The project owner received " their opinions in writing with no objection *General comments* The project has positive impacts in terms of socio-economic aspect, contribute to improve living standard of local people, make good environment pollution, create urban civilized feature and raise public awareness in terms of environment protection. Participants highly agree with the contents presented by the consultant regarding the resettlement action plan, compensation, environmental impacts and environment management plan. Proposed solution with high feasibility, ensuring the requirement for environment protection, dignifying role, responsibility and obligation of local community in implementation of the project. The project Owner is to cooperate with relevant agencies and construction contractors to carry out the works appropriately throughout the project implementation process. The project Owner is to learn from experience of drawbacks encountered in phase 1 implementation to better execute compensation and environment protection in phase 2. The project Owner is to review design and arrange toilets for school to ensure aesthetic aspect, utility efficiency without polluting the environment while making good inadequacies of utilities which have been completed in Phase 1. The project owner is to welcome recommendations, proposals of local community in terms of supplementing environment protection measures, especially mitigation of pollution due to dust and noise produced during construction, reduce impacts on domestic and production activities of local people, execute well the credit program, ensuring technical aspect in connection of interceptors to local households. Grievance redress mechanism There is Law on Complaint No 02/2011/QH13. This Law regulates on complaints and settlement of complaints against administrative decisions or acts of state administrative agencies or competent persons in these agencies; complaints and settlement of complaints related to disciplinary decisions against cadres or civil servants; reception of citizens; management and supervision of complaint settlement work. However . there is no Establish a grievance redress mechanism in The EIA to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
			Grievance redress mechanism of of Duc Ninh WWTP in Dong Hoi City's City in Construction Phase / during construction For all the wards in the project area, the PMU has provided a handbook of contact information of PMU staff & construction unit to local community In the process of supervision, if the communities finds out the environmental issues, they can reflect through the contact information.
6. Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	Yes	Decree 80/ND-CP, August 09, 2006, Decree 21/2008/ND-CP Circular No. 05/2008/TT-BTNMT OP 4.01 - Environmental Assessment	Disclose Draft EIA including the EMP) Summary of the EIA report, environment management plan have been disclosed publicly in Duc Ninh, Ly Trach Commune People Committee, in Aug 3 , 2010 (Document No 315/CV-KDCL of Quang Binh URENCO) The English version of EA report for phase 2 was supposed to be disclosed in Vietnam and at Info shop (USA) on 30th April 2009.
7. Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	Yes No	Circular No. 05/2008/TT-BTNMT guiding strategic environmental assessment, environmental impact assessment and environmental protection commitment	Full Equivalence. The LEP specifies the responsibilities' of project owners to "supervise the implementation of, contents of environmental impact assessment reports," and to properly and fully implement environmental protection contents in environmental impact assessment reports and requirements stated in decisions approving environmental impact assessment reports." Difference The LEP and Circular 05 provide that monitoring reports and minutes of inspection be submitted to agencies concerned but does not specify whether such reports and minutes are to be disclosed to private affected communities or to the general public Implement the EMP of Duc Ninh WWTP Subproject Quang Binh Environment and Urban Development Single Member Limited Liability Company (Hereinafter called "the Employer") and Thang Long Infrastructure Development Joint Stock Company (hereinafter called "the Consultant") entered into the consultation constract on 14th March 2011 for a full package of "External Monitoring Consultant for Environment safety and resettlement under Dong Hoi environment sanitation project, phase 2". The contract took effect as from April 2011 to the end of April 2014. The Consultant commenced the work as from 14th March 2011. Accordingly, every 6 months of the 3 year period, the Consultant shall conduct field trip for monitoring and assessing the effectiveness of the Environment and Resettlement Management System of the project, providing recommendations as well as implementing necessary measures for capacity building. Up to now, four Environmental-Resettlement

SPS Policy Principles	Was Similar Principle Used in the Project? (Yes, No, Not applicable)	Specific Guidelines (i.e. decree, circular or office order/instruction) Used In the Project	Description of Equivalence / Difference and Environmental Performance Review
			Monitoring Reports are carried out: The Report No 1 : 25-28 Apr 2011 The Report No 2 : 1-5 Nov 2011 The Report No 3 : 24-27 Apr 2112 The Report No 4 : 10-14 Nov 2012 Environmental Monitoring Measurement Program Monitoring indicators included Air quality Surface water quality Ground water quality Sludge quality *General comments of EMP Report No 4 – Period No4* Contractors basically have complied with the requirements of mitigation measures during construction. Construction activities at the site have no significant impacts on the environment and the lives of the surrounding residential area. *Results of Environmental Monitoring Measurement* Air quality : Most of parameters within the permissible limits. Level of noise, dust, vibration, SO2 in the project site all below the standards. This demonstrated that the environmental impact on air due to project construction activities was negligible. Surface water: Analysis results of surface water quality in Phong Thuy ditch , Nam Ly Lake , Cau Rao, Le Ky River show that all indicators of oil and grease, heavy metals as well as total suspended solids in water are below the permissible limits compared with Vietnam Standard 08:2008. DO quality of all the samples are above the minimum allowed value. However, some points of surface water monitoring, the concentration of COD, BOD5 exceeds an allowed level as from 1 to 1.5 times. Ground water: the analysis results showed groundwater in the project area still not contaminated by heavy metals, values of heavy metals were much lower than the permissible limits. Sludge quality Sludge quality after dredging and construction of Cau Rao river embankment: concentration of heavy metals in the soil below the permissible limit for soil quality of agricultural production, compared to the standards (QCVN 03: 2008) Sludge quality at the wastewater treatment plant area: the concentration of of heavy metals are below the permissible limits compared to the Standard. Disclose monitoring reports of Duc Ninh WWTP The Environmental –Resettlement Monitoring Reports have been submitted to Quang Binh Province DONRE and WB
8. Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts	Yes	LEP, 2005	Partial Equivalence. The Article 6.1 of LEP provide Propagandizing, educating and mobilizing all people to participate in environmental protection, environmental sanitation, natural landscape protection and biodiversity conservation.

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.			Article 7: Acts to Be Strictly Prohibited Destroying and illegally exploiting forests and other natural resources; Intruding into natural heritage and natural reserves; Difference There is no explicit provision in the legal framework that Do not implement project activities in areas of critical habitats Scope of Duc Ninh WWTP area The project area not in areas of critical habitats
9. Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	Yes	LEP,2005	Full Equivalence. Article 5 of LEP : State Policies on Environmental Protection, in which Utilizing natural resources rationally and economically, developing clean and renewable energies; and promoting waste reduction, reuse and recycling. Improving the effectiveness of, and extending international cooperation in the field of environmental protection and fulfilling international environmental commitments; and encouraging organizations and individuals to participate in, and implement international cooperation in the field of environmental protection. Duc Ninh WWTP Subproject Duc Ninh WWTP was built with investment in line with modern technology, advanced equipment in the worlds. Source to be received wastewater after treatment : My Cuong river that is a tributary of Le Ky river and Le Ky river is a tributary of Nhat Le river The Standards of wastewater after treatment : QCVN 14 : 2008/BTNMT Column B, water is not use for domestic water supply source, equivalence with Column B1 & B2 of QCVN on surface water or costal water
10. Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	Yes	Labour Code of Socialist, Republic of Vietnam , National Assembly , 23 June 1994 (as amended 2 April 2002)	Full Equivalence. Chapter IX, Occupational Safety and Hygiene indicates Article 95 An employer shall be responsible for the provision of sufficient protective equipment and ensuring occupational safety and hygiene, and for the improvement of work conditions in the work place. The employee must comply with all occupational safety and hygiene regulations and the internal labour rules of the enterprise. Any organization or individual engaging in labour activities or production must comply with the laws on occupational safety and hygiene and environment protection Article 96 Where an enterprise wishes to construct a new

SPS Policy Principles	Was Similar Principle Used in the Project? (Yes, No, Not applicable)	Specific Guidelines (i.e. decree, circular or office order/instruction) Used In the Project	Description of Equivalence / Difference and Environmental Performance Review
			establishment, or expand or renovate an existing establishment, for the purposes of production or utilization, preservation, storage, or receipt of machinery, equipment, materials, or items which have strict requirements for occupational safety and hygiene, it must prepare a feasibility study outlining measures to be taken to ensure occupational safety and hygiene in the work place of employees and the surrounding environment in accordance with the provisions of the law. Duc Ninh WWTP Worker Camp is built near by the project site The Project Owner provide worker clean water for cooking & washing, septic tank & sanitation facilities
11. Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	Yes	LEP,2005 Law on Cultural Heritage	Full Equivalence. Article of-LEP - Acts to Be Strictly Prohibited Destroying and illegally exploiting forests and other natural resources; Intruding into natural heritage and natural reserves; Article 35 of Law on Cultural Heritage The principal investor in a project to improve or construct a structure in a place with influence on a cultural site has the obligation to coordinate with state authorities responsible for culture and information and create the conditions allowing them to supervise the construction process. . If an object is found during the construction process that may be a cultural site, relic, antiquity or national treasure, the project holder must temporarily stop work and inform state authorities responsible for culture and information. Upon receiving this report, the state authorities responsible for culture and information must take timely measures to settle the case in order to guarantee the progress of the construction. In cases that are considered to require suspension of construction in that location in order to protect the original condition of the cultural site, the state authorities responsible for culture and information must report up for the next level of authorities to decide Duc Ninh WWTP's EIA: Law on Cultural Heritage No 28/2001/QH10 is used for the EIA

ASSOCIATED FACILITY (LINKED PROJECT) 2: NHAT LE BRIDGE No 2

EIA OF NHAT LE BRIDGE NO2

Name of the Project: " Nhat Le No 2 Bridge Project "

Project Owner: Quang Binh Department of Transportation

Representatives of Project Owner: Project Management Unit for Transportation Sector

Consultant for EIA Preparation : Centre of Environmental Measurement & Engineering ò Quang Binh Province

Guideline used EIA preparation: EA is written in accordance with Vietnam Government Regulations (Laws, Decrees, Circulars..)

Date of EIA Completion :August 2011

The EIA was Approved by Quang Binh Province People Committee, 9 September 2011, Decision No 2285/QD-UBND

SUMMARY OF ENVIRONMENTAL CONDITIONS

Air quality: (dust, SO2 , NO2 ,CO) the results of air quality measurements in 8 stations of Phu Hai ward & Bao Ninh commune were mostly compliant with permitted standards (QCVN 05:2009/BTNMT); Noise :(59.3-67.5 dBa) is within permitted standards (QCVN 26:2010/BTNMT)

Surface water quality : the results of water quality measurements in 7 stations on Nhat Le river were mostly compliant with permitted standards column B2(QCVN 08: 2008/BTNMT), except for BOD5 in some samples which exceed slightly the permitted value

Ground water quality: the results of air quality measurements in 2 stations : 1 in Phu Hai ward & 1 in Bao Ninh commune were mostly compliant with permitted standards (QCVN 09:2008/BTNMT), except for coliform in Phu Hai well which exceed the permitted value (Coliform value was 30 MPN/100ml)

Ecological System

Terrestrial flora : Bao Ninh side : vegetation is mainly casuarina, coconut…; crops , fruit trees are planted in gardens of local peoples ; Phu Hai side: mainly shrub, wild grass, trees for shadow, ornamental trees

Terrestrial fauna : is very limited, mainly dominated by poultry and livestock, such as chicken, duck, dog, cat …

Aquatic flora : flora and fauna of Nhat Le river is abundant and diversity with high value species as shrimps, crab, fish, snail, o

COMPARISON OF ADB SPS (2009) PROVISIONS AND POLICIES/GUIDELINES ADOPTED IN THE LINKED PROJECT AND ENVIRONMENTAL PERFORMANCE REVIEW OF THE PROJECT

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
Environmental Safeguards			
1. Use a screening process as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	. Not applicable/ No equivalence. There are no legal requirements specified regarding the timing of the screening process in relation to elaboration of an environmental	During preparation of Pre-FS & FS	. Environmental Screening in Nhat Le Bridge 2 Project – Dong Hoi The Subproject is classified as environmental category A based on Vietnam Gov Regulation Selection of location of Nhat Le 2 Bridge is not disclosed publically in Phu Hai Ward & Bao Ninh Commune
2. Conduct an environmental assessment to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.	Yes	*Government Regulation* Law on Environmental Protection, 2005 (LEP) Decree 80/ND-CP, August 09, 2006, of the Prime Minister regarding detailed stipulation and guidance on applying the Law of Environmental Protection. Decree 21/2008/ND-CP, February, 28, 2008, amending and supplementing a number of articles of the Government's Decree 80/ND-CP of August 9, 2006; detailing and guiding the implementation of a number of articles of the Law on Environmental Protection. Circular No. 05/2008/TT-BTNMT guiding strategic environmental assessment, environmental impact assessment and environmental protection commitment Biodiversity Law No 20/2008/QH12 Environmental Standards of the State of Vietnam for 1995 – 2005 period; *World Bank safeguard policies*	Nhat Le No 2 Bridge ' EIA The EIA prepared by Centre of Environmental Measurement & Engineering of Quang Binh Province that the Owner hired The Centre for EIA Chapter 4 in EIA : Environmental Impact Assessment included 3 stages Pre Construction Phase Impact due to land acquisition, site clearance and compensation Impacts on ecological system Impacts on social –economic for local peoples During Construction Phase Dust and Air pollution Noise &vibration Wastewater Solid waste Soil Biological resources River water flow Transportation Impacts on social –economic condition Safety risk Operation Phase Air quality River water quality Solid waste Hydrological regime Safety risk Traffic accident Fire risk

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
			Impacts on social –economic condition (both Positive & adverse impacts) Small difference Gender issues & Vulnerable groups , climate change are still not considered in the EIA
3. Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	No	Circular No. 05/2008/TT-BTNMT	Nhat Le No 2 Bridge ' EIA *Lack of Chapter : " Project Alternative "*
4. Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.	Yes	Circular No. 05/2008/TT-BTNMT	EMP in EIA of Nhat Le 2 Bridge EMP included *Environmental Management Program* : A matrix indicated project activities , potential impacts caused by the project, mitigation measures, Who have responsibility to carry out in 3 stages: Pre-construction. During construction, Operation stage *Environmental Monitoring Measurement Program :* included : Monitoring implementation of mitigation measures Environmental Monitoring Program The environmental monitoring program is carried out during 2 phases of the project: Pre-construction (planned to be before construction activities), construction *Pre-construction* Land acquisition Compensation *During construction* Dust & noise Surface water quality Ground water quality Solid waste collection& treatment Monitoring implementation of mitigation measures to ensure labour safety & health Each element monitoring measurement included : Locations, Parameters, frequency, National Standards
5. Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made	Yes	Decree 80/ND-CP, August 09, 2006, Decree 21/2008/ND-CP Circular No. 05/2008/TT-BTNMT	Full Equivalence Commune, ward or township Fatherland Front Committees shall represent communities in contributing opinions in the process of making environmental impact assessment reports of investment projects in their localities. The project owner shall send a document on the project's major investment items, environmental issues and environmental protection

SPS Policy Principles	Was Similar Principle Used in the Project? (Yes, No, Not applicable)	Specific Guidelines (i.e. decree, circular or office order/instruction) Used In the Project	Description of Equivalence / Difference and Environmental Performance Review
known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.			measures and request the commune-level People's Committee and Fatherland Front Committee of the place where the project is to be executed to give opinions. Within fifteen (15) working days after receiving a written request for opinions, commune-level People's Committee and Fatherland Front Committee shall give their opinions in writing and make them public to local people. Small difference There are no provisions in the legal framework that are explicitly intended to ensure women's consultation in the EA process. Public Consultation in EIA of Nhat Le 2 bridge The project owner sent The EIA to Phu Hai & Bao Ninh Ward/ Commune People's Committee and Fatherland Front Committee of the place where the project is to be executed to give opinions; The project owner received " their opinions in writing with no objection *General comments* Participants agree with the contents presented by the consultant regarding the resettlement action plan, compensation, environmental impacts and environment management plan. The project Owner/PMU is to cooperate with relevant agencies and construction contractors to carry out the works appropriately throughout the project implementation process Works progress should be implemented timely, should not be delayed affecting the livelihood of people living along construction material & waste transportation roads Grievance redress mechanism of of Nhat Le 2 bridge There is no Establish a grievance redress mechanism in The EIA to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance
6. Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	Yes	Decree 80/ND-CP, August 09, 2006, Decree 21/2008/ND-CP Circular No. 05/2008/TT-BTNMT	Disclose Draft EIA including the EMP) Summary of the EIA report, have been disclosed publicly in Phu Hai & Bao Ninh Ward/Commune People Committee, in Nov 25 , 2010 (Document No 442/TTr-BQLDA) .

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
7. Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	Yes	Circular No. 05/2008/TT-BTNMT guiding strategic environmental assessment, environmental impact assessment and environmental protection commitment	Implement the EMP of Nhat Le 2 bridge During construction No information Disclose monitoring reports of Nhat Le 2 bridge No information
8. Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	Yes	LEP, 2005	Scope of Nhat Le 2 bridge area The project area not in areas of critical habitats
9. Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans	Yes	LEP,2005	Nhat Le 2 bridge project Chapter 4 - Mitigation Measures This chapter indicates Nhat Le 2 bridge to be invested with modern technology, advanced equipment to ensure gas emission complains with Vietnam Standards Disposal site for sludge/mud/sediment : Phu Hai Ward side: dumping ground with 0.68 ha , far from work site the North 1.1 km Bao Ninh Commune side : Dumping ground in Ha Thon village-Bao Ninh commune, far from the work site the South 200 m Source to be received wastewater after treatment : Nhat Le river The Standards of wastewater after treatment : QCVN 14 : 2008/BTNMT Column B, water is not use for domestic water supply source, equivalence with Column B1 & B2 of QCVN on surface water or costal water

SPS POLICY PRINCIPLES	WAS SIMILAR PRINCIPLE USED IN THE PROJECT? (YES, NO, NOT APPLICABLE)	SPECIFIC GUIDELINES (I.E. DECREE, CIRCULAR OR OFFICE ORDER/INSTRUCTION) USED IN THE PROJECT	DESCRIPTION OF EQUIVALENCE / DIFFERENCE AND ENVIRONMENTAL PERFORMANCE REVIEW
or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.			
10. Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	Yes	Labour Code of Socialist, Republic of Vietnam , National Assembly , 23 June 1994 (as amended 2 April 2002)	Nhat Le 2 bridge' EIA Chapter 4 –Mitigation Measures This chapter indicates The Project Owner provide worker clean water for cooking & washing, septic tank & sanitation facilities Provide mobilize toilet in the Sites
11. Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	Yes	LEP,2005 Law on Cultural Heritage	Nhat Le 2 bridge 's EIA Law on Cultural Heritage No 28/2001/QH10 is used for the EIA

APPENDIX 3
OUTLINE CONTENTS OF EMP MONITORING REPORT

Draft Outline for the Environmental Monitoring Report

1. Introduction

(Purpose of report; order of submission of the report e.g., first, second….nth report; period covered**;** preparer; and structure of the report)

2. Component Description

(Briefly describes the component, its sub-component activities and their sizes/scales, locations, costs and implementation schedules. Remains the same in every reporting, unless there are changes in scope, size or details, locations. Include map showing locations of components.)

3. Physical Progress of the Component

3.1 Previous Reporting Period

3.2 Current reporting period

(target and actual, for each Sub-component, and for Component overall)

4. Compliance with GoV Environmental Requirements

GoV Environmental Regulatory Requirements	Compliance Status

5. Loan Agreement's Environmental Requirements (other than EMP compliance)

Loan Agreement Reference No. & Provision	Compliance Status

6. Compliance with the EMP

6.1 Implementation of Mitigation Measures

From EMP		Measures Undertaken				Necessary Corrective Action	Results
Impacts	Measures	What	When	How often	Effectiveness		

6.2 Conduct of Environmental Effects Monitoring

Monitoring Activity Stated in EMP	Undertaken?			Results	Remarks
	Yes	No	Date		

6.3 Observance of the Grievance Redress Mechanism

Complaint		Complainant		Action Taken	Result	Remarks
When Filed	What	Name	Address			

7. Performance Monitoring

7.1 Effectiveness of Instituted Mitigation Measures (suggested)

Assessment	Description	Scoring
Very Good	96-100% fully effective	5
Good	76-95% effective	4
Fair	51-75% effective	3
Poor	26-50% effective	2
Very Poor	0-25% effective	1

7.2 Performance in EMP Implementation (suggested assessment levels, descriptions & scoring)

A. Environmental Impact Mitigation

Assessment	Description	Scoring
Very Good	96-100% of the required mitigations carried out accordingly	5
Good	76-95% of the required mitigations carried out accordingly	4
Fair	51-75% of the required mitigations carried out accordingly	3
Poor	26-50% of the required mitigations carried out accordingly	2
Very Poor	0-25% of the required mitigations carried out accordingly	1

B. Environmental Effects Monitoring

Assessment	Description	Scoring
Very Good	96-100% of the required effects monitoring carried out accordingly	5
Good	76-95% of the required effects monitoring carried out accordingly	4
Fair	51-75% of the required effects monitoring carried out accordingly	3
Poor	26-50% of the required effects monitoring carried out accordingly	2
Very Poor	0-25% of the required effects	1
	monitoring carried out accordingly	

7.3 Overall Environmental Performance of the Subproject

Impact (EMP)	Performance		Met Target Outcome?			Basis of Info	Remarks
	Indicator (EMP)	Value	Met	Failed			
				Frequency	Date/s		

8. Summary of Corrective/Follow Up Actions to be Taken

9. Lessons Learned

10. Conclusion