

SOCIALIST REPUBLIC OF VIETNAM

**Provincial People's Committee of Phu Yen
Phu Yen's Provincial Project management Unit**

Third Provincial Towns Water Supply and Sanitation Project

ADB Loan No. 1880-VIE (SF)

FINAL REPORT

ON

**INITIAL ENVIRONMENTAL EXAMINATIONS
FOR TUY HOA CITY**

UTILIZATION OF LOAN SAVINGS

December 2008

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INITIAL ENVIRONMENTAL EXAMINATION – TUY HOA SUB-PROJECT

Utilization of Loan Saving

1. Introduction

1.1. Purpose of Report.

The purpose of this initial Environmental Examination is to provide an environmental assessment of *The Tuy Hoa Sub-project - The Loan Savings Utilization Part* that forms part of the Third Provincial Towns Water Supply and Sanitation Project.

The Project is classified as environmental category B by the Bank, and therefore an initial environmental examination (IEE) is required in accordance with the Bank's guidelines.

1.2. Need for Environmental impact Assessment (EIA).

The IEE shows that *The Tuy Hoa Sub-Project - Loan Savings Utilization Part* is unlikely to permanently disadvantage any population groups in the town. Minor disruption will occur during the construction phase, but will be temporary in nature. Although some environmental impacts will occur during construction of the water supply works, long-term environmental effects are expected to be positive.

The adverse environmental impacts of *The Tuy Hoa Sub-Project - Loan Savings Utilization Part* and of the Project as a whole, are limited and can be mitigated. Therefore an EIA not required by the Bank for *The Tuy Hoa Sub-Project - Loan Savings Utilization Part* or for the Project as a whole.

1.3. Government of Vietnam's EIA.

This IEE Report has been prepared to meet the requirements of the ADB, and also provides information that may be used for the Government of Vietnam's (GOV) Environmental impact Assessment (EIA). The consultant HADECON engaged to prepare the GOV's Feasibility Report for *The Tuy Hoa Sub-Project - Loan Savings Utilization Part* will also be responsible for preparing the GOV's EIA Report.

1.4. Identification of Project and Project Proponent.

The Tuy Hoa sub-project - loan savings utilization part will improve the water and sanitation facilities throughout the urban wards of Tuy Hoa, the district Phu Lam, and in the vicinity of Tuy Hoa City Northern and Southern existing residential areas, as part of the Third Provincial Towns Water Supply and Sanitation Project. The proponent of *The Tuy Hoa Sub-Project - Loan Savings Utilization Part* is the Phu Yen Water Supply and Drainage Company (PYWSDC), which is responsible for development of water supply and sanitation services in Phu Yen Province.

1.5. Scope of IEE Study.

This IEE is based on a study of the impact of the proposed works, together with the findings of the household survey, a visual assessment of the general areas that would be affected by *The Tuy Hoa Sub-Project - Loan Savings Utilization Part* together with workshops and meetings with effected households and provincial agencies.

1.6. Study Team.

The study team comprised staff of NJS and HADECON consultants, including the Team Leader (Mr. William E. Koenig); Sociologist (Ngo Nam Hai); HADECON Sub-project Manager (Le Long); and Env. Engineer (Tran Cong Thang).

The staff of PYWSDC provided valuable information and assistance to the study team during visit to the Tuy Hoa City.

2 Description of the Tuy Hoa Sub-Project - Loan Savings Utilization Part.

2.1. Scope of Project.

The Tuy Hoa Sub-Project - Loan Savings Utilization Part includes development of water supply systems to increase coverage in Tuy Hoa City, Phu Lam District and Northern and Southern existing residential areas, adjoin of Tuy Hoa City. The utilization of loan savings doesn't change the target of the Tuy Hoa main sub-project.

The Tuy Hoa main sub-project will increase water supply system capacity from 7.000m³/d to 28.000m³/day, and increase water supply coverage from 31% to 87% throughout Tuy Hoa's urban wards and Phu Lam District town. However, some streets, had been planned, but are not yet built and population growing rate is lower than expected. Therefore, after the expansion of the distribution network, the consuming capacity will increase about 20,000m³/day until 2010 and still about 8,000m³/day redundant. To exploit fully and as soon as possible Tuy Hoa Plant capacity, Phu Yen PPC requests the permission of the Prime Minister and ADB to supply the remaining 8,000 m³/day to the existing residential areas in the vicinity of Tuy Hoa City, where water supply system not yet available. In the utilization of loan savings Project, the facilities will be constructed are reservoir 500 m³, booster pumping station An Phu with capacity 2500m³/d in the north of Tuy Hoa City, reservoir 500m³, booster pumping station Hoa Vinh with capacity 4450m³/d in the south of Tuy Hoa City and rehabilitation of booster pumping station with the same capacity 4450 m³/d and construction new 54km pipelines with difference diameters for water supply to 61.000 person in peripheral of City, who had not been considered in the main sub-project before.

2.2. Need for Project.

Household access to safe piped water in Tuy Hoa's urban wards is only 31%. A large proportion of the urban population use water from contaminated or saline

wells and surface sources, or purchase water from vendors at prices that are often higher than for public supply. Estimated unaccounted-for-water is 17-33%.

Clearly, the pipe water supply system in the town requires urgent improvement and expansion to meet the towns' existing and forecast demands. Sanitation in Tuy Hoa is also inadequate. While many households have septic tanks, a high proportion of these are ineffective. Effluent or seepage from septic tank systems contaminates the groundwater table in areas where wells are used for drinking water.

The town has serious drainage problems. Most sewage is discharged to storm water drains, canals or into rivers or other natural watercourses. The town is situated on the coast, and drainage problems are made worse by high tides. Parts of the Tuy Hoa are flooded several times annually because of large flood flows in the Da Rang River and inadequate, drainage systems. Floodwaters mixed with wastewater expose residents to health risks, as well as causing damage to property and public infrastructure. While most households have septic tanks, a high proportion of these are ineffective due to inadequate piped water.

The Project will address the urgent need in the provincial and district town for greater access to improved water and sanitation facilities, as well as improving the urban environment. Sanitation and drainage improvements under the sub-project will also contribute significantly to improving the urban environment and public health conditions. By improving essential infrastructure, the project will stimulate economic growth and foster investment in the town.

People of the Northern and Southern existing residential areas in the vicinity of Tuy Hoa City is now using water from shallow wells. These shallow wells are exploiting underground water from shallow sand layer right beneath the residential areas and no separating by clay layer, therefore they are usually polluted. Water from wells at wards: Bai Xep, Long Thuy, Nui Thom, Hoa Hiep Bac, Hoa Hiep Trung, Hoa Hiep Nam, Hoa Tam, Hoa Xuan Dong and Hoa Vinh is infected with oil, iron, manganese and salt which exceed permitted standards (according to Report No. 67/TNMT dated 27 April 2007 of Phu Yen Department of Resources and Environment on "Potable water pollution status in some wards of District Dong Hoa"). The balance of temporary redundant water flow of Tuy Hoa water system for these residential areas in short of water is very necessary.

The same situation as in city, in northern and southern existing residential areas will be improved water supply and sanitation and therefore the living condition and economic development will be better.

2.3. Location.

Tuy Hoa is a coastal city, located in Phu Yen Province in southeast Vietnam, approximately 1,158 km from Hanoi. The town lies on the left bank of the Da Rang river adjoining the East Sea.

The northern and southern existing residential areas have the same condition but more nearly to seaside. These areas adjoining the City and expansion of distribution networks will be easily.

2.4. Description of Works

I. The Tuy Hoa main sub-project involves the following works:

- Replace the submersible pumps at the existing Hoa An bore field;
- Construct a new 21.000m³/d capacity bore field in sand deposits at Hoa Thang on the left bank of the Da Rang River.
- Construct a raw water transmission pipeline between the well field and water treatment plant;
- Construct a new 28,000m³/d water treatment plant, treated water pumping station and 3.000m³ capacity reservoir at the site of the reservoir and booster pumping station (currently under construction) located between the Hoa An bore field and the town;
- Rehabilitate the existing distribution network, and replace 2.000 service connections and meters;
- Augment and expand the distribution network;
- Install 12.000 new service connections and meters;
- Rehabilitate and clean existing drains and construct 7,5km of new drains;
- Improve sanitation in schools and public areas;
- Increase coverage of septic tank systems from 65% to 82% through a sanitation credit scheme and legislative initiatives.

II. The utilization of loan savings Project involves the following infrastructure works:

A - Works in Northern Tuy Hoa.

- Investment on pipelines:
 - + HDPE D100mm – L: 2,150m
 - + HDPE D150mm – L: 5,100m
 - + HDPE D200mm – L: 12,520m
- Booster pumping station at An Phu:
 - + Treated water reservoir: 500m³
 - + Pumping station: 03 (three) horizontal pumps with Q = 108m³/h, H = 40m, N = 20kw. Two is in operation and one is for standby.

B - Works in Southern Tuy Hoa.

- Pipelines:
 - + HDPE D100mm – L: 2,950m
 - + HDPE D150mm – L: 1,800m
 - + HDPE D200mm – L: 11,230m

- + Steel pipe D200mm – L: 550m
- + HDPE D250mm – L: 6,500m
- + HDPE D300mm – L: 11,200m
- Booster pumping station at Hoa Vinh:
 - + Treated water reservoir: 500m³
 - + Pumping station: 03 (three) horizontal pumps with Q = 115m³/h, H = 45m, N = 24kw. Two is in operation and one is for standby.
- Rehabilitation of Hoa Hiep PS in the Southern Tuy Hoa.
 - + Pumping station: 03 (three) horizontal pumps with Q = 115m³/h, H = 45m, N = 24kw. Two is in operation and one is for standby.

2.5. Proposed Schedule for Implementation.

The proposed implementation period is from 2008 to 2009. Construction of the additional works is scheduled over the period 2008 to 2009.

Facilities of loan savings are a part of Tuy Hoa sub-project; therefore overall conditions for implementation are very favorable in procedure, human resources and material facilities of PPMU. Construction works are scheduled over the period 2008-2009.

3. Description of the Environment.

3.1. Physical Resources.

Tuy Hoa City is located in the center of Phu Yen Province, on National Highway 1A that links Ho Chi Minh City to Hanoi, and is about 570km from HCMC. The North-South rail way and National Road No 25 to the High lands also pass through Tuy Hoa. The Dong Tac airport is about 7km from the City. The town adjoins the East Sea to the east, Binh Kien rice fields to the northwest, and Da Rang River to the South.

Generally, the town area is relatively flat, except for some moderately high sand banks and the area around Nhan Mountain, which rises to a peak of 65m. The 389m high Chop Chai Mountain is located 2km west of the town. Within the town there is large hill on which a service reservoir and communications tower had been constructed.

Tuy Hoa is situated on Pleistocene and Holocene sedimentary deposits, originating from the river and sea, and comprising mainly sand, gravel, pebbles, clay and shells.

The average rainfall is 2300mm, which is concentrated in six months of the year from July to December. The area surrounding the town is largely rural.

Physical Resources of the utilization of loan savings Project areas:

- + Northern existing residential areas are Bai Xep, Long Thuy and Nui Thom.

+ Southern existing residential areas are Hoa Hiep Trung, Hoa Hiep Nam, Hoa Tam and Hoa Vinh.

These areas have the same climate condition as in City.

3.2. Ecology.

In the main sub-project as in the utilization of loan savings Project, there are no known endangered varieties of flora, species of fish or fauna in the areas proposed for development in the Project. Land areas for the proposed water supply and sanitation development have been developed or disturbed previously and have no forest or unusual vegetation cover.

3.3. Human and Economic Development.

- Population and Communities.

In Year 2000, the population in Tuy Hoa's eight urban wards and ten communes was approximately 126.000 persons, with 27.000 persons in the Phu Lam town.

The population of existing residential areas of the loan savings utilization Project expansion is 61,000 persons. Average member of household is 3-5 persons. The population is made up of over 99% of Kinh, and less than 1% of Chinese, Cham and Heroi.

- Employment and Economy.

In the main sub-project as in the utilization of loan savings Project, the urban areas of Tuy Hoa are principally as a service area for the surrounding provincial, rural regions. Its economy is based on the provision of services to provincial or district populations, market trading, light industry and a local fishing industry.

Light industry, tourism, fishing and food processing are becoming increasingly important to the town's economy. In Tuy Hoa, human and economic development has been constrained by lack of investment and limited infrastructure.

The main sources of employment are in agriculture (rice, raising livestock), small business and service industry, government, fishing, food processing (beer, mineral water, other beverages), handicrafts, and fitting motorbikes with import materials. In 2007 and 2008 years, Phu Yen Province has some foreign big investment Projects with many USD billions, therefore economy of Tuy Hoa has good prospect and the employment will be abundant.

- Infrastructure.

The town has an existing water supply system and some sanitation facilities, but no sewerage system. Tuy Hoa is accessible by road, has power supply from the national grid and, has a number of Government offices.

In the North and the South existing residential areas has not water supply system, waste water system and small quantity of septic tanks in the households. Road system has only stone paved road and pathway. They have the electrical system.

3.4. Items of Archaeological Significance.

In the main sub-project as in the utilization of loan savings Project, there are no known sites of historical or cultural significance in the Project area that are likely to be affected during implementation. However, in the detailed investigation and design of water and sanitation works, particular care will be taken to identify historical and cultural sites, and appropriate steps will be taken to protect any such sites.

3.5. Quality of Life.

- Socio-Economic Value.

Tuy Hoa town comprises eight wards and ten communes.

The overall household size for the town is 4.6 persons. Approximately 5.2% of households are classified as poor. The population is made up of over 99% of Kinh, and less than 1% of Chinese, Cham and Heroi.

The overall household size for northern and southern existing residential areas is more than 4.6 persons in the household and are classified more poor than in City and almost all are Kinh.

- Health Profiles.

In Tuy Hoa and in northern and southern residential areas, community health profiles are less than satisfactory, water supply and sanitation facilities are inadequate and pose an environmental health hazard. The Town Health office and Department of Health advise of health problems including: typhoid, diarrhea, malaria, dengue, skin disease, eye disease, worms, gynecological illnesses, ARI, and malnutrition in children under 17. These illnesses are most prevalent in peripheral-urban areas and communes, although there are still serious illnesses in the urban area e.g. typhoid, and Ward 6 has a disproportionate number of cases of malnutrition, diarrhea, and ARI. The Town Health office has noted a trend of increasing incidence of eye disease.

4. Screening of Potential Environmental Impacts & Mitigation Measures.

4.1. Project Sites.

The water source for Tuy Hoa has inadequate yield and an additional source of supply is required to meet existing and projected demands. A new bore field was developed adjacent to the Da Rang River under the initial component of the project. The bores have been pump-tested and the proposed rate of abstraction is not expected to cause any problems with saline intrusion or ground subsidence. The extraction rate is very small compared to the Da Rang River's minimum dry season flow and will have minimal effect on the river. The bore field is located more than 500m from residents, and is recharged by river flows; thus it will have minimal effect on resident's wells. However, monitoring of the new and existing bore fields will be necessary to check that saline water does not encroach on the bore fields in future as a result of increased water use in the catchments.

The population in Northern and Southern residential areas of project expansion will be supplied water from water system of City environmental impacts are same as in the main sub-project.

4.2. Land.

In the Tuy Hoa main sub-project, Project facilities required more than 14ha of land, including 5ha of agricultural and residential land to be acquired from private owners for construction of the water treatment plant and treated water transmission main. It is not anticipated that there will be a need for resettlement.

The water treatment plant and raw water transmission pipeline had been located on agricultural land, while the new bore field is located on land that is under the control of the PPC. Treated water transmission and distribution mains will generally be constructed along roadways. However, some transmission and distribution pipelines will be laid within road reserves that lie outside the extent of the existing road formation. In some cases, houses and businesses have been constructed on properties that lie within the road reserves, and it will be necessary to run water supply pipelines through these properties. This will involve some temporary resettlement, as well as compensation and restoration costs. Secondary and storm drains in some locations will pass through the rear of private properties.

Land acquisition, compensation and temporary relocation had been carried out in line with the national laws, and appropriate compensation had been paid to affected families. The WSC had been responsible for preparing and implementing the compensation Plans, consulting with affected groups, and carrying out the land acquisition process according to the national laws. Every effort will be made to ensure that the affected persons are not worse off after the Project, and that their incomes and living standards are restored or improved. It will be necessary for the WSC to obtain rights of entry for both construction and ongoing maintenance of the water supply pipelines and drains. These issues had been implemented in the main sub-project and completed before 2006. PYWSC has some experiences in this work.

In the utilization of loan savings part, the land requirement is:

+ For the utilization of loan savings Project, the land requirement for the north part of Project is 0.28 ha for construction of reservoir and booster pumping station An Phu. The PYWSC is owner of this area, there are no need for the resettlement and compensation.

+ The land requirement for the south part of Project is 1 ha for construction of 2 reservoir 500m³, booster pumping station, 01 pipe storage and administration house Hoa Vinh. At the end of preparation of feasibility study report, the PPC of Phu Yen decides use public land under control of PPC, for construction of reservoir and booster pumping station Hoa Vinh, these are no need too for the resettlement and compensation.

- + Rehabilitation booster pumping station of industrial zone is located in area of WSC, therefore this isn't need for the resettlement and compensation.
- + All transmission and distribution pipelines of the north and the south part of Project will be installed in the national road, in the existing roads and footpaths of town, and may not involve compensation for farmland and building land.
- + Funding has been budgeted for potential crop loss where existing crops along the transmission line will be affected. Where possible the Contractor will carry out installation of the pipeline after harvest of crops to minimize the impact.

- Resettlement and Compensation.

The resettlement problem for the utilization loan savings Project therefore is no need. The compensation of seasonal crops for the transmission pipeline will be done if the contractor can not construct transmission pipeline, when the crop had been harvested. PYWSC is in charge of compensation seasonal crops for 3200m transmission pipeline along National road with about 800.000.000VND equivalent to USD 48,193.

4.3. *Design Aspects.*

The design for utilization of loan savings as in main sub-project had been considered as follow:

- Land: In the design stage, land use will be recommended to minimize the surface and to choose public land for the booster pumping stations. The transmission and distribution pipelines will be installed within the National road, in the existing roads and footpaths of town, and scheduled to minimize the impact of compensation for crops.

- Protection of Sources: The capacity of water supply system had been considered about 28.000 m³/day in the main sub-project, but due to enlarge of water supply areas for service more then 61.000 person, the capacity of water supply system can increase to 33.600m³/day with peak coefficient of 1.2. This increase didn't effect the protection of water sources. Tuy Hoa water source is located at the downstream end of developed catchments. The quality of the water is ensured by use of wells with the well water treated. A grout seal is provided at the upper part of the wells and the wells are sealed to prevent surface water from entering the well.

- Noise

Noise generated by pumping stations and workshops will be minimized by providing thick foundation and bases for equipment, and solid sound-absorbing walls.

- Water Quality in network

In the Tuy Hoa main sub-project and the utilization of loan savings Project, to safeguard water quality, all treated water reservoirs will be covered and ventilated and the systems operated to ensure that the distribution network is maintained under pressure to minimize potential risk of contamination from

polluted groundwater and backflow. A standby generator is installed at the treatment plant to ensure continuous supply of water at adequate pressure.

- **Wastewater:** In the main sub-project, the increased quantity of water delivered to the urban areas will generate additional volumes of wastewater that have potential to aggravate the already unsatisfactory condition of much of the existing sanitation and drainage system. The Project includes investment in drainage and sanitation, legislative initiatives, a public health awareness program and a sanitation credit scheme (SCS) to ensure that there is no deterioration in existing conditions.

Rolled over funding from repayments received under SCS provide a budget for continued expansion of the credit scheme. The SCS program is administered by the Provincial Women's Union of Phu Yen.

(i) - Decision about approved budget for implementation of commune awareness for sanitation and septic tank credit of Third Provincial Towns Water Supply and Sanitation Project No 1043/QDD-UBND on 04 July 2008. Total approved budget is: 486.982.000VND eq.29.400USD, including:

- + Payment some arising item exceeding estimation: 40.066.800 VND
- + Payment for 2008 and 2009: 446.915.000VND

Approved budget is taking from remaining budget up to 31/12/2007.

(ii) - Decision about management regulation, sanitation credit utilization of Third Provincial Towns Water supply and Sanitation Project ADB Loan 1880-VIE (SF) in Phu Yen Province from 2008. PPC of Phu Yen Province assigned Provincial Woman Union be the main responsible for implementation this program in association with other concerning departments.

(iii) - Construction of additional storm and sewage systems in the north and the south areas of Tuy Hoa, where pipe network will be installed, are planned by the Phu Yen PPC to be carried out under the Fourth Provincial Towns Water Supply and Sanitation Project.

- **Groundwater.**

In the main sub-project and the utilization of loan savings Project, groundwater of bore fields Hoa An and Hoa Thang will be used. In general the quality of Tuy Hoa's groundwater is good except, where iron and manganese are present and the water needs treatment. However, seawater intrusion and high density development is adversely affecting quality in the coastal area. Although signs of groundwater contamination have been observed in some areas, it is not yet critical in most areas, intrusion along the coast during the low flow season is the main water quality problem in Tuy Hoa. The problem is severe when there is not enough flow towards the sea to prevent seawater backflows traveling upstream. Since larger quantities will be abstracted in future for irrigation and other purposes, existing water supply systems will be unable to cope. The areas affected by salinity are likely to increase unless preventive measures such as new salinity control dams are constructed to release flows during the dry season. The

result of grounder water investigation had been estimated all situations under seawater intrusion and had been approved by National Hydro-geological reserves committee.

4.4. Construction Stage.

- Environment monitoring organization is needed in this stage.
- Particular Specifications, PS 1.19 – Environmental Mitigation Measures, incorporates the environmental mitigation requirements into the Contract.
- The General Technical Specifications (GS) and Particular Specifications (PS) are referred to for further detail of the mitigation requirements of the Contract.
- Environmental Impacts and mitigation measures are as follows.

Environmental Impacts and Mitigation Measures – Construction Stage

Impact	Mitigation measures	Liability	Time	Primary price
Construction stage				
Disruption of water supply due to site works	Announce water supply interruptions two to three days prior to actual cut-off; and complete the connection to the existing system in the shortest possible time. The Contractor’s work program to take into consideration minimal disruption of water supply. Vietnamese Regulations, General and Particular Specifications (PS 1.06)	Contractor – through enforcement of PS 1.06 of the Particular Specifications	Not exceeding 12 hr as required by PS 1.20 – D of Particular Specifications	No additional cost provision made. Penalty beyond 12 hrs is \$500 per day (PS 1.20 – F).
Sludge generated by wastewater during construction course	There is no construction of additional treatment works under loan savings to generate additional sludge.			
Dust due to site works and transport of materials	Water spaying on exposed areas during dry days, provision of truck covers carrying construction materials such as soil, sand etc. as required under Vietnamese Regulations and Technical Specifications Section 02221.	Contractor – through enforcement of Technical Specifications, Section 02221.	At time work is being carried out at any section of work and during delivery and removal of relevant materials.	No additional cost provision made.

Traffic obstruction during excavation of trench for pipe laying	Coordination with local authorities, provision of signs and the other requirements of PS 1.21, Traffic Control	Contractor – through enforcement of Specifications Section 01570 & PS 1.21.	During period works are carried out in each section.	No additional cost provision made.
Noise during construction	As much as possible, activities that generate excessive noise shall be confined to normal daytime working hours.	Contractor – through enforcement of Specifications, Section 02221.	Daytime	No additional cost provision made.
Damage to roads.	Immediately restore roads and other areas affected by pipe laying and construction activities.	Contractor – Public Roads: PS 2.11 – A; and Private Roads: PS 2.11 – B.	Within 10 days after work is executed	No additional cost provision made.
Improper handling and disposal of excavation of spoils causing nuisance, sedimentation of water resources and obstruction of canal and stream flows.	Dispose of excess soil properly and adequately protect temporary soil stockpiles so that these will not be washed away during downpours.	Contractor – through enforcement of General Specifications, Section 02221.	During construction	No additional cost provision made.
Safety hazards during construction.	Provide workers with protective clothing including masks, hard hats, gloves, safety shoes, etc. Avoid creation of stagnant water bodies. Provide first aid and medical facilities to workers. Provide adequate protection to the general public such as safety barriers and marking of hazardous areas, provision of safe access across the construction site to people whose settlements & access are temporarily severed by pipe laying works.	Contractor – through enforcement of General Specifications, Section 01450, Resettlement Plan requirements, and Vietnamese Regulations.	During construction.	No additional cost provision made.
Affecting landscape in the area	Good clearance. Tidy up after constructing.	Contractor	During and after construction	No

Affecting agricultural activities	Constructing when finishing cropping wherever possible; with payment made for unavoidable crop loss.	Contractor	Before and during construction	VND 800 million is budgeted for crop loss compensation.
Damage to existing facilities	There are no known existing facilities to be reinstated.			
Sludge arising due to wastewater from construction	Construct in dry season	Contractor	During construction	No

4.5. Operation Stage.

In the main sub-project and the utilization of loan savings Project, to ensure safe water is delivered, effective monitoring of the treatment processes, operation and maintenance procedures and daily chlorine residual testing in the extremities of the distribution system will be instituted, Periodic microbiological testing of treated water will also be carried out in accordance with the recommended type tests and frequencies recommended in the WHO Drinking Water Guidelines.

Appropriate planned preventive maintenance programs will be developed for all facilities constructed under the Project, and for existing facilities. On the job training and structured training courses will be given to operation and maintenance supervisory staff, and will include vocational training as well as occupational health and safety, particularly where this involves the use of potentially hazardous chemicals, such as chlorine gas.

The Project has also provided operation and maintenance equipment necessary to enhance sustainability, including leak detection equipment, pipe cutting and threading equipment, vacuum tankers (for septic tank sludge removal and transport) and push carts for community solid waste collection. The Environmental Impacts and Mitigation Measures are listed as follows.

Environmental Impacts and Mitigation Measures – Operation Stage

Impacts	Mitigation measures	Liability	Time	Primary price
<i>Operation Stage</i>				
Conflicts of raw water abstraction with downstream users	Groundwater extraction minimizes impact.	Hydro-Geological Survey Organization	Permanent – National Reserves Committee	No additional
Increasing erosion at the influent well.	Not happen when exploiting underground water.	Water Supply Company	Site inspection during and after construction	No additional
Pollution due to improper disposal of sludge	Not happen due to treatment of sludge.	Water Supply Company	Site inspection during Operation stage	No additional
Increase the volume of wastewater needed to be treated.	Provision of Septic Tanks by extension of SCS program	Provincial Women’s Union of Phu Yen	On-going program of Women’s Union	No additional
Low quality of supplied water.	Periodic examination	Preventive Health Center	Permanent according to regulations	No additional
Safety hazards due to Chlorine use.	Periodic examination	Department of Labor	Unannounced site inspections	No additional

5. Overall Environmental Review.

In the main sub-project and the utilization of loan savings project, following the implementation of the Project, which comprises water supply development, environmental sanitation improvements, a public health awareness program, sanitation credit scheme and an institutional strengthening component, it is expected that there will be a marked improvement in the environmental condition of Tuy Hoa. This will contribute to an improvement in the quality of life and community health profiles for the town.

The public health awareness program is most important to the overall success of the Project.

6. Potential Environmental Enhancement.

In the main sub-project and the utilization of loan savings Project, the most beneficial impact of this project is the significant improvement to the health, well being and quality of life to the entire community of Tuy Hoa, who will benefit from having access to a reticulated supply of good quality potable water and also associated improved sanitation infrastructure.

The Project will provide reliable supply of good quality potable water, without which people and industry would have poor quality water and limited supplies. The Project will alleviate the deterioration of groundwater conditions in urban areas adjacent to the coast, which, if unchecked, will result in increased salinity and contamination of wells.

7. Institutional Requirements and Environmental Monitoring Program.

The Management Unit of Phu Yen Water Supply and Environmental Sanitation Project (PPMU) is the executing agency for this project.

The Law on Environmental Protection was passed by the Government in December 1993. This was followed in October 1994 by a Decree (175/CP) on Regulations Implementing the Law on Environmental Protection. This legislation empowers the PPCs and Government departments to develop and enforce environmental regulations and to evaluate environmental impact assessment reports.

Specific measures to be implemented as part of the Project include:

- (i) Monitoring of groundwater quality and quantity;
- (ii) Introduction of legislation to prevent development and environmentally harmful human activities in the vicinity of the borefields;
- (iii) Control and monitoring of activities in the catchment upstream of water supply borefields;
- (iv) Enforcement of regulations for treatment and discharge of industrial wastewater;
- (v) Licensing industrial, commercial and domestic use of groundwater in sensitive areas, and banning industrial and commercial use of groundwater in areas where piped water supply is available.

The Project includes laboratory-testing equipment that will be used to regularly monitor the qualities of the raw and treated water. To enhance the effectiveness of the Project, the Government should introduce modified regulations in the Project towns requiring residents and business, commercial and industrial establishments to upgrade their sanitation facilities and to register them with the WSC. These include the conversion of dry pit latrines to pour-flush, construction of septic tanks and their upgrading, where necessary, and establishing connections from septic tanks to community drains.

In addition, the following measures were proposed (i) as a condition of building approval, all new houses should have properly constructed septic tanks; (ii) all new industry should provide sewerage and drainage facilities and comply with the Government's wastewater standards; and (iii) existing industry should comply with the Government's wastewater standards within a period of three years, or cease operation.

This program, to be developed and implemented by the WSCs, is expected to have a positive impact on the urban environment.

A computerized billing system/management information system is installed at each WSC to monitor and manage the septic tanks in the communities, and serve as a maintenance management system.

Monitoring programs are:

- Monitoring the quality of raw water: monitoring the quality of raw water is the first standard which is checked daily, shift by shift to ensure adjusting the operating regime, ensure the quality of treated water. The site where we take sample is at water intake. Standards analyzing are: pH, SS, colour, E.Coli, ... with testing frequency is 1 time/shift.
- Monitoring treated water quality: standards are tested daily, fully-analyzing samples are tested monthly to compare with current standard of domestic water. The site where we take sample is at the treatment unit (after finishing each treatment process).
- Monitoring the ambient air quality at treatment plant: monitoring following standards: climate, illumination, dust, noise which inside and outside the workshop with testing frequency is 4 times/year.

- Monitoring waste water which discharged in treatment process, assessing the influence when discharge it to the environment.

Information above is updated, assessed and recorded frequently. If problem break out, we will cooperate with appropriate authorities to have suitable measures.

- The PPMU and the Engineer for the project (NJS Consultants) will monitor implementation of IEE requirements during construction as part of construction supervision for the works.
- The Engineer will report any environmental problems encountered during construction with required remedial actions in the Quarterly Report prepared for the Project and submitted to the PCU, the PPMU and the ADB on a quarterly basis.

Environmental Monitoring Organizations:

- Environmental Officer of the Provincial Project Management Unit of main sub-project and the utilization of the loan savings is in charge of Environmental monitoring in construction stage.

- Environmental Officer of Labor Department is in charge of the health and labor safety in operation stage.

- Environmental Officer of Preventive health center is in charge of water quality.

Community consultation: During the implementation of main sub-project the community consultation was completed by Woman Union with very good result in following items: sanitation community awareness, community health and septic tank credit according to demand of ADB. In the Loan saving utilization the budget for these purposes had been approved by PPC, therefore, in this IEE some issues will be considered as follow:

- + The Woman Union is in charge of public consultation.
- + Two consultation meetings will be organized in the north and the south areas and after FS approving by ADB.
- + Participants is project affected individuals and people’s organizations.
- + Information Disclosure of project and some concerning purposes will be propagandized broadly.

8. Public Consultation and Information Disclosure

Project information, including scope of construction, impact minimization, and disclosure information are also made a part of the Resettlement Plan for the project. Public disclosure campaigns involve the local Ward representatives for the areas involved and the Provincial Women’s Union for the province; in addition to the PPMU with the details as follows:

8.1. Date and Venue:

Time: 8:00 - 10.30 am on 7 October 2008

Venue: Office of Hoa Vinh People’s Committee

8.2. Participants:

No	Names	Positions	Address
<i>I</i>	<i>Phu Yen PPMU</i>		
1	Nguyen Phu Lieu	Deputy Director	
2	Tran Thi Luc Ha	Head of Compensation unit	
3	Nguyen Dai Huynh	Staff	
<i>II</i>	<i>Local Agencies</i>		
<i>1</i>	<i>Land Office</i>		
	Le Van Uyen	Head of the unit	
<i>2</i>	<i>Women Union</i>		
	Nguyen Thi Xuan Oanh	Chairwoman	
<i>III</i>	<i>Affected people</i>		
1	Tran Tan Quyen		Hoa Vinh Commune
2	Huynh Ngoc Cu		Hoa Vinh Commune
3	Pham Phich		Hoa Vinh Commune
4	Huynh Tan		Hoa Vinh Commune
5	Luong Ngoc Thai		Hoa Vinh Commune
6	Nguyen Van Tong		Hoa Vinh Commune
7	Huynh Van Tao		Hoa Vinh Commune
8	Pham Phinh		Hoa Vinh Commune
9	Nguyen Van Tri		Hoa Vinh Commune
10	Nguyen Thi Huong		Hoa Vinh Commune
11	Huynh Sanh		Hoa Vinh Commune
12	Tran Dung		Hoa Vinh Commune
13	Cao Thi Chuc		Hoa Vinh Commune
14	Nguyen Chan		Hoa Vinh Commune
15	Nguyen Tra		Hoa Vinh Commune
16	Le Van Thinh		Hoa Vinh Commune
17	Le Ngoc Lien		Hoa Vinh Commune
18	Nguyen Tan Vinh		Hoa Vinh Commune
19	Nguyen Xuan Loc		Hoa Vinh Commune

8.3. *Information/topic presented:*

The Phu Yen PPMU presented:

- Make a brief Third Provincial Towns Water supply and Sanitation Project, donors, beneficiaries, organization for implementation, and time for completion.
- The need for the construction of additional works from loan savings for South and North of Tuy Hoa; approval decisions of the loan savings from the donors, the Government and PPC.

- Summary of the works to be built in the project, the areas for construction and their influences to the crop plants, trees in the affected areas as well as the environment and people's life (if any) during construction, methods for compensation, mitigating influences during construction and operation of the works.
- Necessary information of the Implementing Agency (Phu Yen PPMU) for contact in case there is any complaints or questions

8.4. *Issues, concerns and perception of stakeholders on the proposed project:*

Stakeholders in the consultation highly appreciated the proposal of using Loan Savings to build water supply systems for the captioned areas. Representatives from local authorities and affected residents considered that the construction of water supply systems is required to serve the people's demands, the selected areas was suitable and therefore influences from the works to people in the areas is not serious.

The most concerns of stakeholders was that the land acquisition and compensation for site clearance; influences from the construction and operation the project works to daily activities of the people and environment.

8.5. *Issues will be addressed under project:*

IA explained clearly in the consultation that all the project works will be located in the public land, so no relocation is required; compensation for crop plants or trees (if any) shall be carried out complied with the Government regulations and PPC Phu Yen. The list of affected objects, unit rate to be used, date for compensation and other concerned information will be advised to the people and local authorities and their involvement in the compensation process are required.

Influences during construction: The influences (if any) are minor and temporary. Implementing Agency committed that a compulsory provision should be stated out to the winning bidder during contract negotiation to mitigate the interruptions/influences to people's life and their production such as dust, traffic interruption, damage to roads, obstruction of canal and stream flows. Affected people should be notified of the locations of the works, time for construction, the contractor and their contact information, before start of the construction.

Influences during operation: Noise caused by pumping stations: Such noise can be limited by providing thick foundation and bases for equipment, and solid sound-absorbing walls.(pumping stations shall be built in an independent area).

Upon completion the project and put into operation, Water Supply Company shall have suitable operation policies and periodically supervision aimed at minimizes the impacts if happen.

9. **Conclusion.**

In the main sub-project and the utilization of loan savings project, if implemented in accordance with the proposed design, the Project is not expected to have any significant adverse environmental impact, but will improve human and

environmental conditions. The success of the whole Project will require strong support for the environmental awareness program on the part of the provincial organizations and improved institutional performance in the enforcement of laws and regulations.

It is considered that the proposed sub-project will be environmentally sustainable provided that the recommended environmental management plans are prepared and followed during the detailed design, construction and post construction monitoring phases of the project.

<p>Project leaflet</p> <p>The Tuy Hoa Water Supply System Project will be loan funded by ADB. This loan has been negotiated by the Government of Vietnam and ADB.</p> <p>This project is to expand the water supply network to the areas where have urgent demand for clean water. After evaluation, Phu Yen People Committee has decided to expand the clean water coverage toward the North and the south of Tuy Hoa City. This project will supply clean water for the community living in Bai Xep, Long Thuy, An Phu, Hoa Hiep Bac, Hoa Hiep Trung, Hoa Hiep Nam, Hoa Tam, Hoa Xuan Dong, and Hoa Vinh communes.</p> <p>Why is this project necessary to implement?</p> <p>The community living in above commune is facing to the difficulty in getting clean water. The ground water storages are low, poor quality, high hardness, salinity, iron, CT and SO4 concentration are high. The surface water resource is affected by salinity, especially in dry season. In addition, the surface water from Da Rang River is also affected by salinity, hardness characteristic. In the middle and the end of rainy season, water flow from Da Rang River and causing flood for the area. Consequently, the community has to use the unhygienic water for daily activities and production.</p> <p>Scope of construction and impact minimization</p> <p>The construction will include laying pipeline system and 2 booster pumping stations.</p> <p><i>The pipeline system</i></p> <p>Digging trench to lay the pipe in will be implemented in the National road, existing road, footpath and on rice field. The width of trench will be from 0.8m to 1.5m. There will be no impact to properties or houses as well as no land acquisition and resettlement happened.</p> <p>Time for reinstatement of the national road and existing roads in these areas will be maximum 10 days after they are excavated. The trench may cause some disturbance for people living along the pipeline when they leave their houses to the National Road or footpaths. Therefore, the contractors will provide timber boards and construction signal boards until the trenches are refilled.</p>	<p>The construction will be followed as rolling style that means the new trench will not be dug until the adjoining trenches are refilled and the surface is reinstated.</p> <p><i>2 booster pumping stations</i></p> <p>Booster pumping station No. 1 will be located at An Phu in Hung Vuong industrial zone of Tuy Hoa City. There will be no PPC's decision for land acquisition because the PYWSC is owner of this land.</p> <p>Booster pumping station No.2 will be located at Hoa Vinh, peripheral of Tuy Hoa, Phu Yen province on the Government land lot under control of Phu Yen PPC. The land will be transferred to PYWSC without resettlement and compensation requirements.</p> <p>How are the construction impacts supervised and monitored</p> <p>The PPMU will monitor the contractor during construction work. The records of any disturbance to people living along the pipeline will be prepared and a report issued to the PYWSC for solution within 7 days.</p> <p>The resettlement plan that states clearly all entitlements and mechanism for ensuring there are no people or properties affected during construction has been disclosed at the People Committee of Tuy Hoa City in Vietnamese and English. Anyone can access this document to understand further about the project and construction work as well as entitlement if any for properties or land affected by construction.</p> <p>Any persons living in the construction site who are affected by the construction or annoyed by the contractors can contact the PPMU at the following address:</p> <p>Nguyen Phu - PPMU director Third Provincial Towns Water Supply and Sanitation Project The Management Unit of Phu Yen Water Supply and Environmental Sanitation Project Address: 229 Le Loi St., Tuy Hoa, Phu Yen Telephone number: 057 824 202; 057 827 030</p>
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PS 1.06 Notification to Residents, Business and Public

A The Contractor shall hand deliver to each residence and business in close proximity to the site, a written notice three days in advance of commencing any construction work, including delivery of pipe, which will involve temporary inaccessibility or water shutdown to their properties. Said notice shall state when operations will start and approximately when they will end. The notices shall be printed on A4 paper with wording similar to that shown as follows in Vietnamese and English.

NOTICE

To The People in this area

Within the next few days, work will be started on the construction of the Water Supply Improvements – Major Works serving Bai Xep, Long Thuy, An Phu, Hoa Hiep Bac, Hoa Hiep Trung, Hoa Hiep Nam, Hoa Tam, Hoa Xuan Dong, and Hoa Vinh communes as part of the Third Provincial Towns Water Supply and Sanitation Project. We should complete the work by

.....

This work may cause some inconvenience but will be of permanent benefit.

We will appreciate your co-operation in the following:

- *please be alert when driving or walking in, or near the construction area;*
- *tools, materials, pipe and equipment are attractive to children. For their safety, please keep them away from the construction site;*
- *please report all inconvenience to the job superintendent or call the office at the number given below.*

This work is being performed for the Provincial Project Management Unit of Tay Ninh Urban Water Supply and Sanitation, on behalf of the Government of the Socialist Republic of Vietnam by:

(Insert name, address and telephone number of the Contractor in this space)

We will endeavor to complete this work as rapidly as possible and with a minimum of inconvenience to you.

Signed:

Title:

SOCIALIST REPUBLIC OF VIETNAM

**Provincial People's Committee of Ninh Thuan
Ninh Thuan's Provincial Project Management Unit**

Third Provincial Towns Water Supply and Sanitation Project

ADB Loan No. 1880-VIE (SF)

FINAL REPORT

ON

**INITIAL ENVIRONMENTAL EXAMINATIONS
FOR PHAN RANG CITY**

UTILIZATION OF LOAN SAVINGS

December 2008

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INITIAL ENVIRONMENTAL EXAMINATION – PHAN RANG SUB-PROJECT

Utilization of Loan Saving

1. Introduction

1.1 Purpose of Report

The purpose of this Initial Environmental Examination is to provide an environmental assessment of the Phan Rang town – Ninh Thuan province project that forms part of the Third Provincial Towns Water Supply and Sanitation Project.

The Project is classified as environmental category B by the Bank, and therefore an initial environmental examination (IEE) is required in accordance with the Bank's guidelines. This IEE for the Phan Rang town – Ninh Thuan province project assesses the likely consequences and impacts of the implementation of water and sanitation improvements in Phan Rang.

1.2 Need for Environmental Impact Assessment (EIA)

The IEE shows that the Phan Rang town – Ninh Thuan province project is unlikely to permanently disadvantage any population groups in the town. Minor disruption will occur during the construction phase, but will be temporary in nature. Although some environmental impacts will occur during construction of the water supply works, long-term environmental effects are expected to be positive.

The adverse environmental impacts of the Phan Rang town – Ninh Thuan province project, and of the Project as a whole, are limited and can be mitigated. Therefore an EIA is not required by the Bank for the sub-project of the Project as whole.

1.3 Environmental Impact Assessment of the Vietnamese Government

This IEE Report has been prepared to meet the requirements of the ADB, and also provides information that may be used for the Government of Vietnam's (GOV) Environmental Impact Assessment (EIA).

1.4 Project identification and the Employer

The Phan Rang town – Ninh Thuan province project will improve the water and sanitation facilities throughout the urban and suburban areas of Phan Rang, as part of the Third Provincial Towns Water Supply and Sanitation Project.

The proponent of the Phan Rang town – Ninh Thuan province project is the Ninh Thuan Water Supply and Drainage Company (NTWSDC), which is

responsible for development of water supply and sanitation services in Ninh Thuan Province.

1.5 Scope of IEE Report

This IEE is based on a study of the impact of the proposed works, together with the findings of the household survey, a visual assessment of the general areas that would be affected by the sub-project, together with workshops and meetings with provincial agencies.

1.6 Survey Team

The study team comprised staff of NJS and VIWASE consultants, including the Team Leader (Mr William E.Koenig); Deputy Team Leader (Mr.Ngo Nam Hai); Project Engineer (Mr. Nguyen Viet Thanh); and VIWASE's engineers.

The staff of TNWSDC provided valuable information and assistance to the study team during several visits to Phan Rang. In particular the assistance of the Director, Mr Duong, is gratefully acknowledged.

2. Description of The Phan Rang town – Ninh Thuan province Project

2.1 Project type

The additional works under loan savings includes expansion of the water supply systems to increase coverage to additional areas in the Phan Rang. Provision of additional water supply, transmission and distribution; environmental sanitation improvements, including combined drainage systems improvements, increased coverage of septic tanks, schools sanitation improvements; a public health awareness program; and development of institutional frameworks and organizations to ensure sustainability were completed under the program for initial works.

The Phan Rang town – Ninh Thuan province project will increase water supply system capacity from 7,000 m³/d to 44,000 m³/d, and increase water supply coverage throughout Phan Rang's urban wards, communes and adjacent residential areas from 32% to 81%.

At present, the Project is deploying to construct with capacity Q=52.000m³/d and expectation show in use at the beginning second quarter 2008. After extending distribution water supply system, consumption capacity will increase about 40.000m³/d to 2010, and redundancy capacity is some 12.000m³/d. To utilize fully capacity of Phan Rang water treatment plant, Ninh Thuan Provincial People's Committee submitted to the Government and ADB for permitted to supply the remains of 12.000m³/d to residential from the North-East of Phan Rang town, in particular, Tri Hai commune, Nhon Hai commune and Thanh Hai commune where there is no water supply system.

2.2 Need for Project

Some communes of Ninh Hai district such as Khai Hai town, Vinh Hai commune, Phuong Hai, Xuan Hai and Tan Hai commune are using cleaned water from Ninh Thuan Water Supply Company and Rural Water, Environmental and Sanitation Centre. The majority of people utilize deep well, drilling well are not treated, water quality is not adequate.

Sanitation in Phan Rang is also inadequate. While most households have septic tanks, a high proportion of these are ineffective. Effluent or seepage from septic tank systems contaminates the groundwater table in areas where wells are used for drinking water.

The Project will address the urgent need in the provincial and district towns for greater access to improved and extended water supply system, as well as improving the urban environment. By improving and extending water supply system, the Project will stimulate economic growth and foster investment in the town.

2.3 Location

Phan Rang-Thap Cham is capital of Ninh Thuan Province (pop. 580.000), and is located on National Highway 1, some 344 km north of Ho Chi Minh City. The town is located on the coastal strip adjoining the South China Sea.

Three communes of Ninh Hai district will be provided clean water, including: Tri Hai (pop. 9.047), Nhon Hai (pop. 13.312) and Thanh Hai (pop. 6.862) communes.

2.4 Description of works

The works will supply clean water to 25,000 persons (80% of the projected year 2010 population of 31,000).

The additional of the Phan Rang town – Ninh Thuan province project involves the following infrastructure works:

- Improvement and replacement of existing cast-iron pipeline D300 (on roads: Tran Phu, Thong Nhat, Quang Trung, Ho Xuan Huong, To Hieu, Le Loi), the length 3500m.
- Improvement and replacement of existing cast-iron pipe line D250-300 on Truong Chinh road by cast-iron pipe D300, the length 5000m.
- Construction of new cast-iron pipeline D300 from the end of Yen Ninh road, through Tri Thuy bridge and along inter-provincial road 702, the length 10.860m.
- Construction of booster pumping station, the capacity 5000m³/d in Nhon Hai commune.
- Construction of cast-iron pipeline D200 from booster pumping station along inter-provincial road 702.

- Construction of distribution pipeline HDPE D150, the length 11000m.
- Construction of distribution pipeline HDPE D100, the length 5000m.

Metered service connections will be made using separate funding outside the project.

2.5 Proposed schedule for implementation

The proposed implementation period is from 2008 to 2009. Construction the additional works is scheduled over the period 2008-2009.

3. Description of the Environment

3.1 Physical Resource

Phan Rang is a coastal town, situated at the mouth of the Cai River, which also provides the town's water supply source. Most of the town lies on unconsolidated sediments, mainly layers of clayey sand, sandy clay and clay with sand, of varying thickness, and its terrain is relatively flat.

Phan Rang-Thap Cham town has a good transportation network and natural facilities.

Annual rainfall is very low at 500-800mm and mainly distributed from September to November.

3.2 Ecology

There are no known endangered varieties of flora, species of fish or fauna in the areas proposed for development in the Project. Land areas for the proposed water supply and sanitation development have been developed or disturbed previously and have no forest or unusual vegetation cover.

3.3 Human and Economic Development

Population and Communities

The town consists of nine wards and four communes, covering an area of 7,916 Ha. The two communes nearest the sea are the fastest growing areas. In Year 2000, the population of the town's urban wards and communes was approximately 150,000.

The additional Sub-project consists of expanding the water supply distribution network to the three communes of Ninh Hai district: Tri Hai, Nhon Hai and Thanh Hai commune.

Employment and Economy

The urban areas of the town serves principally as the service area for the surrounding provincial, rural regions. Its economy is based on fishing the provision of services to provincial or district populations, market trading, light industry and light industry. According to the approved Master-plan,

future development will concentrate on tourism. Ninh Thuan authorities and people are striving to develop and modernize the town.

In Phan Rang, human and economic development has been constrained by lack of investment and limited infrastructure.

The main sources of employment are small business, agriculture (paddy rice, vineyards), fishing, laboring or unskilled work, and some professional and government occupations.

Infrastructure

The town has an existing water supply and basic sanitation system. The town is accessible by road, and rail, has power supply from the national grid and has Government offices.

3.4 Items of Archaeological Significance

In the detailed investigation and design of water and sanitation works, particular care will be taken to identify historical and cultural sites, and appropriate steps will be taken to protect any such sites.

3.5 Quality of Life

Socio-Economic Values

Phan Rang is one of the poorest provincial towns. The town comprises nine wards and four communes, with an average of 5.0 persons/household. Approximately 13.7% of households are classified as poor, ranging from 5.3 to 17.0% in the urban wards and 16.5 to 20.5% in the communes.

The principal ethnic group is the Kinh, with 5% Cham, and less than 1% Chinese. The highest concentration of Cham is in Thanh Hai commune (53.8%).

Health Profiles

In the town, community health profiles are less than satisfactory, water supply and sanitation facilities are inadequate and pose an environmental health hazard.

The Town Health Office and Department of Health advise of health problems including typhoid, diarrhea, dengue, eye disease, and gynaecological illnesses. Cases of cholera were recorded up until 1996.

4. Screening of Potential Environment Impacts & Mitigation Measures

4.1 Project sites

The water source for Phan Rang is the Da Rang River, which has adequate yield, but the capacity of the raw water system requires augmentation. The

existing source is supplemented by releases from upstream storages and can safely support the future water demands of the towns to 2010 and beyond.

4.2 Land

Transmission and distribution mains will generally be constructed along roadways. However, where houses and businesses have been constructed within the road reserves, the water supply pipeline alignment will be adjusted to avoid existing encroachments. In these cases, the pipelines will be laid under the paved roadway; and the pavement reinstated.

Additional of the Sub-project, improvement and replacement of existing water supply system, construction new pipeline water supply system, construction booster pumping station capacity of 5.000m³/d in Nhon Hai Commune. The Additional works have been prepared as follows:

- Improvement and replacement of existing cast-iron pipeline: Most of the distribution pipelines will be laid on the pavements in accordance with the master plan of Phan Rang town.
- Construction new pipeline serves for four communes: Most of the distribution pipelines will be laid on the pavements.
- Construction booster pumping station: The proposed area for construction of the booster pumping station where is owned by Nhon Hai Commune.

4.3 Design Aspects

Protection of sources

Phan Rang's water source is located in a developed catchment. Upstream activities in the catchment include urban development, agriculture, and light industry. As industries, agricultural and urban development will continue to grow in the basin, pollution, which is already a problem, could become critical if preventive measures were not taken. The water source is protected through regulation of activities near and upstream of the water intake. The risk of pollution of sources of supply was minimized by legislation and appropriate design.

Salinity

Salinity intrusion along the coast during the low flow season in the main water quality problem in the coastal Project towns. However, this is not likely to be a problem for Phan Rang's water supply source, which is protected from saline intrusion by the Lam Cam Dam built across the Cai River.

Water Quality

To safeguard water quality, all treated water reservoirs will be covered and ventilated and the systems operated to ensure that the distribution network is maintained under pressure to minimize potential risk of contamination from

polluted groundwater and backflow. A standby generator is installed at the treatment plant to ensure continuous supply of water at adequate pressure.

Noise

Noise generated by pumping stations and workshops will be minimized by providing thick foundation and bases for equipment, and solid sound-absorbing walls.

Wastewater

The increased quantity of water delivered to the urban areas will generate additional volumes of wastewater that have potential to aggravate the already unsatisfactory condition of much of the existing sanitation and drainage system. The Project included investment in drainage and sanitation, legislative initiative and a public awareness program to ensure that there is no deterioration in existing conditions. Construction of additional storm and sewage systems in Ninh Thuan are planned by the Ninh Thuan PPC to be carried out under the Fourth Provincial Towns Water Supply and Sanitation Project. Expansion of the Sanitation Credit Scheme is available from rolled-over funds derived from repayments of prior credit extensions.

Sludge Disposal

Backwash water from the filters and clarifier at the WTP is discharged into sludge lagoons adjacent to the water treatment plant. The sludge is dewatered in the lagoons and on sludge drying beds and then taken by truck to the town’s landfill. Surplus water from the lagoons and drying bed is discharged to the drainage system adjacent to the treatment plant. There are no additional works within the additional works under loan savings to generate sludge.

4.4 Construction stage

- Environment monitoring organization is needed in this stage.
- Particular Specifications, PS 1.19 – Environmental Mitigation Measures, incorporates the environmental mitigation requirements into the Contract.
- The General Technical Specifications (GS) and Particular Specifications (PS) are referred to for further detail of the mitigation requirements of the Contract.
- Environmental Impacts and mitigation measures are as follows.

Environmental Impacts and Mitigation Measures

Impact	Mitigation measures	Liability	Time	Primary price
<i>Construction stage</i>				
Disruption of	Announce water	Contractor –	Not exceeding	No additional

water supply due to site works	supply interruptions two to three days prior to actual cut-off; and complete the connection to the existing system in the shortest possible time. The Contractor's work program to take into consideration minimal disruption of water supply. Vietnamese Regulations, General and Particular Specifications (PS 1.06)	through enforcement of PS 1.06 of the Particular Specifications	12 hr as required by PS 1.20 – D of Particular Specifications	cost provision made. Penalty beyond 12 hrs is \$500 per day (PS 1.20 – F).
Sludge arising due to wastewater from construction	Construct in dry season	Contractor	During construction	No
Sludge generated by wastewater during construction course	There is no construction of additional treatment works under loan savings to generate additional sludge.			
Dust due to site works and transport of materials	Water spaying on exposed areas during dry days, provision of truck covers carrying construction materials such as soil, sand etc. as required under Vietnamese Regulations and Technical Specifications Section 02221.	Contractor – through enforcement of Technical Specifications, Section 02221.	At time work is being carried out at any section of work and during delivery and removal of relevant materials.	No additional cost provision made.
Traffic obstruction during excavation of trench for pipe laying	Coordination with local authorities, provision of signs and the other requirements of PS 1.21, Traffic Control	Contractor – through enforcement of Specifications Section 01570 & PS 1.21.	During period works are carried out in each section.	No additional cost provision made.

Noise during construction	As much as possible, activities that generate excessive noise shall be confined to normal daytime working hours.	Contractor – through enforcement of Specifications, Section 02221.	Daytime	No additional cost provision made.
Damage to roads.	Immediately restore roads and other areas affected by pipe laying and construction activities.	Contractor – Public Roads: PS 2.11 – A; and Private Roads: PS 2.11 – B.	Within 10 days after work is executed	No additional cost provision made.
Damage to existing facilities	There are no known existing facilities to be reinstated.			
Improper handling and disposal of excavation of spoils causing nuisance, sedimentation of water resources and obstruction of canal and stream flows.	Dispose of excess soil properly and adequately protect temporary soil stockpiles so that these will not be washed away during downpours.	Contractor – through enforcement of General Specifications, Section 02221.	During construction	No additional cost provision made.
Safety hazards during construction.	Provide workers with protective clothing including masks, hard hats, gloves, safety shoes, etc. Avoid creation of stagnant water bodies. Provide first aid and medical facilities to workers. Provide adequate protection to the general public such as safety barriers and marking of hazardous areas, provision of safe access across the construction site to people whose settlements & access are temporarily	Contractor – through enforcement of General Specifications, Section 01450, Resettlement Plan requirements, and Vietnamese Regulations.	During construction.	No additional cost provision made.

	severed by pipe laying works.			
Affecting landscape in the area	Good clearance. Tidy up after constructing.	Contractor	During and after construction	No
Affecting agricultural activities	Constructing when finishing cropping.	Contractor	Before and during construction	No

4.5 Operation stage

Establish a well-trained management staff with full of management equipment and examine the construction regularly.

Environmental Impacts and Mitigation Measures

Impacts	Mitigation measures	Liability	Time	Primary price
<i>Operation Stage</i>				
Conflicion between raw water exploitation needs	Exploit underground water, surface water, not affecting the source of water.	Investigation company for hydrological geology.	Approved by State council of Reserves	No
Increasing erosion at the influent well.	Not happen when exploiting underground water.	Project owner	During and after construction	No
Pollution due to improper disposal of sludge	Not happen due to treatment.	Project owner	During management	No
Increase the volume of wastewater needed to be treated.	Not happen due to treatment.	Project owner	During management	No
Low quality of supplied water.	Periodic examination	Health prevention center.	Regularly	No
Dangerousness due to Chlorine use.	Periodic examination	Department of labor	Regularly	No

- All environmental impacts above have and direct or indirect influence on human, mainly the health and labor productivity of the workers. In addition, accident at work, fire and detonation also have an implicit influence on the workers. Therefore we must take care of safety at work measures,

preventive measures of fire and detonation, improve the working condition of laborers.

- In general, environmental impacts in this phase are expected to be executed about technique and technology aspects, in order to reduce negative impacts with an acceptable expense. Problems which need to be taken care of is raising the management and control. However, positive impacts which brought from the project is: creating jobs, which bring stable income for many people, training and increasing skill of controlling and operating equipment, high-tech line, creating industrial working style, and above all is meeting the treated water needs, creating conditions for the socio-economic development.

5. Overall Environmental review

Following the implementation of the Project, which comprises water supply development, improvement and replacement of existing pipeline water supply, it is expected that there will be a marked improvement in the environment condition of the communes. This will contribute to an improvement in the quality of life and community health profiles for the town.

The public health awareness program is most important to the overall success of the Project.

6. Potential Environmental Enhancement

The most beneficial impact of this project is the significant improvement to the health, well being and quality of life to the entire community of Phan Rang, who will benefit from having access to a reticulated supply of good quality potable water and also associated improved sanitation infrastructure.

The Project will provide reliable supply of good quality potable water, without which people and industry would have poor quality water and limited supplies.

7. Institution Requirements and Environment Monitoring Program

The Provincial Project Management Unit of Ninh Thuan Province Water Supply Third Project (PPMU) is the executing agency for this project.

The Law on Environmental Protection was passed by the Government in December 1993. This was followed in October 1994 by a Decree (175/CP) on Regulations Implementing the Law on Environmental Protection. This legislation empowers the PPCs and Government departments to develop and enforce environmental regulations and to evaluate environmental impact assessment reports.

Specific measures to be implemented as part of the Project include (i) introduction of legislation to prevent development and environmentally harmful human activities in the vicinity of the water intake; (ii) control and

monitoring of activities in the catchment upstream of water supply intakes and borefields; (iii) enforcement of regulations for treatment and discharge of industrial wastewater (iv) licensing industrial, commercial and domestic use of groundwater in sensitive areas, and banning industrial and commercial use of groundwater in areas where piped water supply is available.

The Project includes laboratory-testing equipment that will be used to regularly monitor the qualities of the raw and treated water. To enhance the effectiveness of the Project, the Government should introduce modified regulations in the Project towns requiring residents and business, commercial and industrial establishments to upgrade their sanitation facilities and to register them with the WSC. These include the conversion of dry pit latrines to pour-flush, construction of septic tanks and their upgrading, where necessary, and establishing connections from septic tanks to community drains.

In addition, the following measures were proposed (i) as a condition of building approval, all new houses should have properly constructed septic tanks; (ii) all new industry should provide sewerage and drainage facilities and comply with the Government's wastewater standards; and (iii) existing industry should comply with the Government's wastewater standards within a period of three years, or cease operation.

This program, to be developed and implemented by the WSCs, is expected to have a positive impact on the urban environment.

A computerized billing system/management information system is installed at each WSC to monitor and manage the septic tanks in the communities, and serve as a maintenance management system.

Monitoring programs are:

- Monitoring the quality of raw water: monitoring the quality of raw water is the first standard which is checked daily, shift by shift to ensure adjusting the operating regime, ensure the quality of treated water. The site where we take sample is at water intake. Standards analyzing are: pH, SS, colour, E.Coli, with testing frequency 1 time/shift.
- Monitoring treated water quality: standards are tested daily, fully-analyzing samples are tested monthly to compare with current standard of domestic water. The site where we take sample is at the treatment unit (after finishing each treatment process).
- Monitoring the ambient air quality at treatment plant: monitoring following standards: climate, illumination, dust, noise which inside and outside the workshop with testing frequency is 4 times/year.
- Monitoring waste water which discharged in treatment process, assessing the influence when discharge it to the environment.

Information above is updated, assessed and recorded frequently. If problem break out, we will cooperate with appropriate authorities to have suitable measures.

options to minimize dust and noise nuisance, so not to impact to the surrounding environment. The labor force will be registered and governed by the local authorities as well as agreed by the concerning agencies.

8.4. Concerns of the residents in the project affected area

The supply of piped water for the local inhabitants is scarce and deficiency. They desire that the project will be implemented soon so that they can have a chance to access the piped water. They in the affected area are fully support to the implementation.

8.5. Issues relating to environment landscapes (recommend, if any)

During project construction, it is necessary to minimize the impacts to the environment (as stated in the IEE Report) and reinstatement landscape as its status before.

9. Conclusion

If implemented in accordance with the proposed design, the Project is not expected to have any significant adverse environmental impact, but will improve human and environmental conditions. The success of the Project will require strong support for the environmental awareness program on the part of the provincial organizations and improved institutional performance in the enforcement of laws and regulations.

It is considered that the proposed sub-project will be environmentally sustainable provided that the recommended environmental management plans are prepared and followed during the detailed design, construction and post construction monitoring phases of the project.

Project leaflet

The Ninh Thuan Water Supply Loan Savings Works will be funded by a loan provided by ADB. This loan has been negotiated by the Government of Vietnam and ADB.

This project is to expand the water supply capacity and distribution network to the areas where there remains an urgent demand for clean water. After evaluation, the Ninh Thuan Provincial People's Committee has decided to expand the clean water supply capacity and distribution for Ninh Hai. This project will install a water transmission main from the Dong My Hai Booster Pumping Station to a new booster pumping station that will be built in Ninh Hai; and provides for a water distribution network to be installed in Ninh Hai to serve this area.

Why is this project necessary to implement?

The community residents in Ninh Hai are facing difficulty to obtain clean water. The ground water storage is low, of poor quality and high hardness. The surface water resources in the area are not clean and heavily polluted. Some flooding occurs during the rainy season. Consequently, the community is in need of a clean water supply.

Scope of construction and impact minimization

The construction will include laying a transmission pipeline from the existing Dong My Hai Booster Pumping Station, constructing a new booster pumping station at Ninh Hai, and laying additional pipelines for distribution in Ninh Hai.

The pipeline system

Digging trench to lay the pipeline in will be implemented along the roads from the Dong My Hai BPS and the new booster pumping station in Ninh Hai; and pipelines for distribution will be installed in Ninh Hai. The width of trench will be from 0.8m to 1.2 m. There will be no impact to properties or houses as well as no land acquisition and resettlement happened.

Time for reinstatement the highway and roads in will be maximum **10 days** after they are excavated. The trench may cause some disturbance for people living along the

pipeline when they leave their houses to the highway or houses to the highway or roads. Therefore, the contractors will **provide timber boards and construction signal boards** until the trenches are refilled.

The construction will be followed as rolling style that means the new trench will not be dug until the adjoining trenches are refilled and the surface is reinstated.

Nonh Hai Booster Pumping Station

The Booster Pumping Station in Ninh Hai will boost the pressure of water received from the Dong My Hai BPS. A 1,000 m³ reservoir will be built at the BPS site for water storage.

How are the construction impacts supervised and monitored

The PPMU will monitor the contractor during construction work. The records of any disturbance to people living along the pipeline will be prepared and a report issued to the PPMU for solution within **7 days**.

The resettlement plan that states clearly all entitlements and mechanism for ensuring there are no people or properties affected during construction has been disclosed at the Provincial People Committee of Ninh Thuan. Anyone can access this document at the PPMU, Ninh Thuan to understand further about the project and construction work as well as entitlement if any for properties or land affected by construction.

Any persons living in the construction site who are affected by the construction or annoyed by the contractors can contact the PPMU at the following address:

Third Provincial Towns Water Supply and Sanitation Project-

Mr. Nguyen The Duong, Director,
Project Management Unit,
Ninh Thuan Province Component,
23 Nguyen Trai Street,
Phan Rang-Thap Cham Town,

Ninh Thuan Province,

Telephone Number: 068 820 350

Attachment 2.

PS 1.06 Notification to Residents, Business and Public

A The Contractor shall hand deliver to each residence and business in close proximity to the site, a written notice three days in advance of commencing any construction work, including delivery of pipe, which will involve temporary inaccessibility or water shutdown to their properties. Said notice shall state when operations will start and approximately when they will end. The notices shall be printed on A4 paper with wording similar to that shown as follows in Vietnamese and English.

NOTICE

To The People in this area

Within the next few days, work will be started on the construction of the Water Supply Improvements – Major Works serving Ninh Hai Town as part of the Third Provincial Towns Water Supply and Sanitation Project. We should complete the work by

This work may cause some inconvenience but will be of permanent benefit.

We will appreciate your co-operation in the following:

- please be alert when driving or walking in, or near the construction area;*
- tools, materials, pipe and equipment are attractive to children. For their safety, please keep them away from the construction site;*
- please report all inconvenience to the job superintendent or call the office at the number given below.*

This work is being performed for the Provincial Project Management Unit of Tay Ninh Urban Water Supply and Sanitation, on behalf of the Government of the Socialist Republic of Vietnam by:

(Insert name, address and telephone number of the Contractor in this space)

We will endeavor to complete this work as rapidly as possible and with a minimum of inconvenience to you.

Signed:

Title:

SOCIALIST REPUBLIC OF VIETNAM

**Provincial People's Committee of Kien Giang
Kien Giang's Provincial Project Management Unit**

Third Provincial Towns Water Supply and Sanitation Project

ADB Loan No. 1880-VIE (SF)

FINAL REPORT

ON

**INITIAL ENVIRONMENTAL EXAMINATIONS
FOR RACH GIA CITY**

UTILIZATION OF LOAN SAVINGS

December 2008

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INITIAL ENVIRONMENTAL EXAMINATION –RACH GIA SUB-PROJECT

Utilization of Loan Saving

1 Introduction

1.1 Purpose of the Report on Initial Environmental Examination (IEE)

The purpose of the Initial Environmental Examination (IEE) report is to provide the Environmental Impact Assessment Report for the construction by utilization of loan savings after bidding of the Rach Gia sub-project, a component of the Third Provincial Towns Water Supply and Sanitation Project.

ADB has classified this project as Environment B, and this requires a preparation of an IEE report to the Bank guidelines. IEE report assesses possible results and impacts of the implementation of the water supply and sanitation improvement in Rach Gia town.

1.2. Environmental Impact Assessment (EIA) requirements

The IEE shows that the works built by the loan savings has brought the permanent benefits for people in the town. However, some impacts are adverse but not significant and happen in the short time. The positive impacts are considered as major.

Loan savings utilization part as well as the entire project, in general, will be provided with limit measures to mitigate such adverse impacts from the project. Therefore, the EIA report preparation is not required by the Bank for the supplementary investment part under the loan savings as well as the whole project.

1.3. Environmental Impact Assessment of the Government of Vietnam

The preparation of this IEE report aims to satisfy ADB requirements and provide information that may be used in the EIA of the Government of Vietnam.

1.4. Project identification and the Employer

The construction part under the loan savings after bidding of the Rach Gia sub-project is a component of the Third provincial towns water supply and sanitation project

The Employer, Kien Giang Water supply and Sewerage Company, is responsible for the improvement of water supply, drainage and sanitation services in Kien Giang province.

1.5. Scope of IEE report

The IEE report is a basis for the study of impacts from the new work items, together with household investigation, visual assessment of public areas affected by the project which is utilized under the loan savings after bidding.

1.6. Survey team

The survey team of WASE consists of Mr. Dang Duy Tinh (Team leader of WASE), Mr. Tran Van Uyen (Project Manager), social staff and environment engineers.

The survey team had been supplied with valuable information and provided with assistance from Kien Giang Water supply and Sewerage Company during site investigation in the project area.

2 Description of Rach Gia sub-project

2.1. Project type

The scope of this sub-project is the expansion of water supply system of the Rach Gia sub-project towards North West, from Rach Gia town to Hon Dat town to increase the service coverage rate of clean water to people in Rach Gia town.

The project includes the works to be built consisting of installation of water pipeline from the main project to the North-Western area of Rach Gia town along the national highway 80 with a length of 30km, population in the project area is of 80,000 inhabitants. This will bring the health improvement and benefit increased by the clean water supplying from the project.

2.2 Needs for the project

The town water supply system expansion under the loan savings shall supply water to approximately of 80,000 people living along the National highway 80 from Rach Gia town to Hon Dat town, meeting the water demands from people here which is serious shortage of water due to salt and sulfate contaminated and ground water and surface water all year around.

By the construction of a clean water supply system, consequently, economic growth is increased and speeding up industrial development in this area.

2.3 Location

Location of the project which is invested by loan savings is the residents living along the national highway 80, on the North-West from Rach Gia town to Hon Dat town, with a length of the area about of 30km. Total population is of about 80,000 inhabitants.

2.4 Description of Works

Based on the existing loan savings and the necessity of investment as mentioned above, the following additional works are proposed:

- + Installation of additional pumps in the treated water pumping station to supply separately to this area.
- + Construction of 2 booster pumping stations along the transmission pipeline from Rach Gia town to Hon Dat town.
- + Installation of treated water transmission and distribution pipelines, total length of about of 34,380 m of DN100 – DN300 PVC pipes, and 30,000 m of DN50/60-DN80/90 HDPE pipes.
- + Installation of 26 Fire hydrants.

2.5 Proposed implementation schedule

The proposed implementation period is from 2008 to 2009. The loan negotiation is expected to finish in 2008. Execution of works is expected to be completed in 2009.

3 Natural, eco-social conditions of the project site

3.1 Natural conditions

The area to be built is a coastal region, in the Mekong delta, the South-Eastern most town of Vietnam, average annual rainfall is of 1,980mm from May , to November. Its terrain is rather even and flat and low; located along the Rach Gia – Ha Tien canal.

The neighbors is a rural area. Ground water and surface water are used as a water source. However, they are all salt contaminated seriously in dry season.

The entire area located on the land which has just been raised with silt with a significant thickness. The top soil layer is mostly of clay and fine clay.

No other project within the project area. This is a sub-urban area, low population density, farming land is mainly rice fields.

3.2 Ecology

There are no known endangered varieties of flora, species of fish or fauna in the project area.

Land areas for the proposed water supply and sanitation development have been developed or disturbed previously and have no forest or unusual vegetation cover.

3.3 Development of human resource and economy

Population and residential community

Population in the project area which is utilized by loan savings after bidding is about of 80,000 people in the sub-urban communes and Hon Dat town.

Employment and economic

The main sources of employment in the urban area are mainly farming and fishing, a small number of people earn by services and trading.

Infrastructure

The project area is located along the national highway 80 from Rach Gia town to Hon Dat town, this road is in good condition and there is a medium voltage line of the national electric grid.

3.4 Archaeological Significance

There are no known sites of historical or cultural significance in the Project area that are likely to be affected during implementation. However, in the detailed investigation and design of water and sanitation works, particular care will be taken to identify historical and cultural sites, and appropriate steps will be taken to protect (if any).

3.5 Quality of life

Socio – economic values

Living standard of people in the project area is rather good, but still lower than that of Rach Gia town

There are around 4 -5 people/ household. The poor makes up 5.6%, and the Khmer people about of 6.7% of the total population.

Health profiles

Community health in Thu Dau Mot has not been improved; however, water supply and sanitation system has not ensure in hygiene.

The main diseases are mainly from water born such as diarrhea, typhoid, jaundice, sore eyes, petechial fever, infection.

4 Research on Environmental Impacts & Mitigation Measures

4.1 Screening of environment

Service area of the project is a residential areas.

- Location: located along the national highway 80 from Rach Gia town to Hon Dat, close to Rach Gia – Ha Tien canal..
- Topology: relatively even and flat, surface ground ranging from 0.3m - 0.9m, the highest area on North West, low gradually towards South East.
- Climate: the project area is in the tropical monsoon region. There are two distinct seasons: rainy season lasting from May to November; and dry season lasting from December to April of the next year. Average annual rainfall is 2,103mm; average annual temperature is 27,5°c; and average annual humidity is 82%.
- Surface water source: Rach Gia – Ha Tien canal running along the project area is salt contaminated in dry season and sulfated in the early rainy season.
- Ground water: ground water is shallow, low yield and also seriously salt and sulfate contaminated.

4.2. Construction plan site

Comprises of 2 areas:

- One site along the national highway 80 from Rach Gia town to Hon Dat town, for installation of transmission and distribution pipelines and construction of 2 booster pumping stations.
 - Another site is area of Hon Dat town for installation of water pipelines as supplying water to the Hon Dat town area.
- + Area a long the national highway 80:**
- Along national highway 80 prolonging form Rach Gia town (Treated water pumping station of Rach Gia town Water supply system) to Hon Dat town, about 30km long.
 - Its topography is relatively even and flat, ground surface level ranging from 0.90 to 1.50m.
 - The existing width of the National highway 80 is averagely of 7m, the left of about 3-8m wide and right of 4-7m wide, the planned right of way is of 22m (as per actual right of way).
 - The road surface is asphalted, pavement of earth or cement, and tiling for both pavements.

- On the left side of national highway 80 from Rach Gia to Hon Dat is the dense residential area, a construction density is about 80% of the length road. Behind building and works are rice fields.
 - On the right side are houses with a construction density of 60% of the length road. Behind them are Rach Gia – Ha Tien canal.
 - The national highway 80 has 10 bridges crossing road, made of RC, bridge piles and handrail are also made of RC, the length of bridges averagely 30-50m.
 - There is a medium voltage line on the left side of national highway.
 - The two land sites which proposed to build 2 booster pumping stations, each has 300m² area (15mx20m), are now empty to be sold by people for work construction.
- + **Area in Hon Dat town:**
- The Hon Dat town area is under development as per the planning, nevertheless, some roads are relative full, the remains are stone roads.
 - Most of them are without any pavement; earth roadside.
 - The trading area in the town is under construction, completed some roads, but not yet bettered, stone road surface, not yet tiling for pavements.

4.3 Design stage

The mitigation measures during design period:

- Using required land in minimum and taking advantages of state land;
- Out of houses, trees, farm produce, electrical poles...
- Provide the sensible construction methods, very few air pollution, minimize the disordered life of people.
- Select potential water source for future without impacts from the urban development.

Water quality

- Water source protection must be done, no domestic and construction wastewater as well as mud and soil must be discharged into the water sources.
- When clean water is conveyed to remote areas, additional Chlorine for residual Chlorine exists in water at the downstream.
- Ensure that the treated water pipes have permanently pressures to avoid infiltration of ground water as well as domestic and industrial wastewater. Standby power generators are provided at both the Raw Water Pump Station and the WTP to maintain supply.

Pay attention: the works shall be designed so as to use construction machine, generator with a little capacities without noise or provide a soundproof method no affect people and operators.

Wastewater

In the utilization of loan savings, no have cost for construction of drains, however, PPMU has a left cost from the main project for the community education and the people's voluntariness in construction of sanitary septic tanks and seepages (*in the circumstance, seepages no impact on drinking water*).

Sludge disposal

Sludge works of the water treatment unit built by loan savings shall be disposed as the main project. There are no additional treatment works within the additional works under loan savings to generate sludge.

4.4 Construction stage

- Organization of environment monitoring during construction course is needed.
- Particular Specifications, PS 1.19 - Environmental Mitigation Measures, incorporates the environmental mitigation requirements into the Contract.
- The General Technical Specifications (GS) and Particular Specifications (PS) are referred to for further detail of the mitigation requirements of the Contract.
- Environmental Impacts and mitigation measures are as follows:

Environmental Impacts and Mitigation Measures

Impacts	Mitigation measures	Implemented by	Duration	Primary Price
<i>Construction stage</i>				
Disruption of water supply due to site works	Announce water supply interruptions two to three days prior to actual cut-off; and complete the connection to the existing system in the shortest possible time. The Contractor’s work program to take into consideration minimal disruption of water supply. Vietnamese Regulations, General and Particular Specifications (PS 1.06)	Contractor – through enforcement of PS 1.06 of the Particular Specifications	Not exceeding 12 hr as required by PS 1.20 – D of Particular Specifications	No additional cost provision made. Penalty beyond 12 hrs is \$500 per day (PS 1.20 – F).
Dust due to site works and transport of materials	Water spaying on exposed areas during dry days, provision of truck covers carrying construction materials such as soil, sand etc. as required under Vietnamese Regulations and Technical	Contractor – through enforcement of Technical Specifications, Section 02221	At time work is being carried out at any section of work and during delivery and removal of relevant materials.	No additional cost provision made.

Impacts	Mitigation measures	Implemented by	Duration	Primary Price
	Specifications Section 02221.			
Traffic obstruction during excavation of trench for pipe laying	Coordination with local authorities, provision of signs and the other requirements of PS 1.21, Traffic Control	Contractor – through enforcement of PS 1.21	During period works are carried out in each section.	No additional cost provision made.
Noise during construction	As much as possible, activities that generate excessive noise shall be confined to normal daytime working hours.	Contractor – through enforcement of General Specifications, Section 02221	Daytime	No additional cost provision made.
Damage to roads.	Immediately restore roads and other areas affected by pipe laying and construction activities.	Contractor – Public Roads: PS 2.11 – A; and Private Roads: PS 2.11 – B.	Within 10 days after work is executed	No additional cost provision made.
Improper handling and disposal of excavation of spoils causing nuisance, sedimentation of water resources and obstruction of canal and stream flows.	Dispose of excess soil properly and adequately protect temporary soil stockpiles so that these will not be washed away during downpours.	Contractor – through enforcement of General Specifications, Section 02221	During construction	No additional cost provision made.
Safety hazards during construction.	Provide workers with protective clothing including masks, hard hats, gloves, safety shoes, etc. Avoid creation of stagnant water bodies. Provide first aid and medical facilities to workers. Provide adequate protection to the general public such as safety barriers and marking of hazardous areas, provision of safe access across the	Contractor – through enforcement of Technical Specifications, 01450, Resettlement Plan requirements, and Vietnamese Regulations.	During construction.	No additional cost provision made.

Impacts	Mitigation measures	Implemented by	Duration	Primary Price
	construction site to people whose settlements & access are temporarily severed by pipe laying works.			
Sludge generated by wastewater during construction course	Construction in dry season	Contractor	During construction course	no
Impact on landscape in the project area	Good site arrangement. Clean up after construction completion	Contractor	During and after construction	No
Impact on farming	Construction after harvest	Contractor	Before and during construction course	No

4.5 Operation stage

- Building of a professional management staff, provision of adequate equipment for permanent management and inspection of works.
- Environmental Impacts and mitigation measures are as follows:

Environmental Impacts and Mitigation Measures

Impacts	Mitigation measures	Implemented by	Duration	Primary Price
<i>Operation and Management stage</i>				
Conflicts during take raw water and benefit from water source	Take surface water, no impact on source	Hydrogeology Survey Company	Reserve approved by the State Reserve Council	No
Increase erosion at the inlet pit	Bank consolidation, construction of concrete embankments	Contractor and Employer	Implemented already in the main project	No
Cause pollution, should sludge disposal be inappropriate	No happen because of already treatment	Employer	During management	No
Increase wastewater volume, treatment is required	No happen because of already treatment	Employer	During management	No
Supply water with poor quality, not meeting standards	Periodical examination	Health Institution	Permanently	No
Danger, should Chlorine be used	Periodical examination	Department of Labour	Permanently	No

5 Appraisal of environment

- The Loan Saving Utilization project shall create additional sanitary water, consequently, enhance the people's health, time saving, create jobs for people.
- The environmental impacts are only temporary, happening in short time and controlled by the mitigation measures.

6 Environmental Potential Enhancement

The impact bringing the most benefit of the project is the significant improvement of health, high living standard to the community in the Rach Gia town area. The project will supply water with good in quality for domestic and industrial uses. The project shall reduce the ground water deterioration. Therefore, the project does not have the potential adverse impact on environment.

7 Institution requirements and environmental monitoring program

- The Kien Giang Water Supply and Drainage Company - Provincial Project Management Unit (PPMU) and the Provincial Peoples Committee of Kien Giang Province set up the water environmental monitoring program during and after project construction to:
 - + Monitor water source and raw water quality;
 - + Monitor water quality after treated;
 - + Monitor the wastewater discharging into environment.
- The PPMU and the Engineer for the project (NJS Consultants) will monitor implementation of IEE requirements during construction as part of construction supervision for the works.
- The Engineer will report any environmental problems encountered during construction with required remedial actions in the Quarterly Report prepared for the Project and submitted to the PCU, the PPMU and the ADB on a quarterly basis.

8 Public Consultation and Information Disclosure

Project information, including scope of construction, impact minimization, and disclosure information are also made a part of the Resettlement Plan for the project. Public disclosure campaign with the details as follows:.

- The meeting was held at 08:00 am on December 6th, 2008 at the office of Hon Dat PC, Kien Giang province
- Participants:
 - The representative households in hamlet Dau Voi, Hon Dat District Mr. Ngo Truong Sinh
 - The representative households in hamlet Tri Ton Hon Dat District Mr. Tran Hiep Liet
 - The representative of Hon Dat District PC: Mr. Ngo Hoang Tuoi, Chairman
 - The representative of Son Kien Commune PC: Mr. Tran Ngoc Phu, Vice chairman
 - The representative of Soc Son Commune PC: Mr. Phan Chanh Loc, Temporary chairman
 - The representative of My Lam Commune PC: Mr. Ngo Phong Phu, Chairman
 - The representative of the household effected by construction of booster pumping station Mr. Dinh Cong Bang

The representative of Kien Giang PPMU

Mr. Tran Van Nhan

Position: Vice director of PPMU

Mr. Truong Hoang Van

Position: Staff of PPMU

- Contents of Meeting:

+ Mr. Tran Van Nhan presents the information of the project on purposes, quantities of construction works, and period for implementation of the works.

+ Mr. Truong Hoang Van presents the environmental impacts assessments report.

- The opinions of households:

The representative households in hamlet of Dau Voi and Tri Ton, Hon Dat District and households along the national road No. 80 presented the existing current water supply situation as underground water without treatment or surface polluted water from salinity and alum. The project implementation will improve piped water source as well as health and expectation of life. The temporary impacts on life activities, traveling, crop plants, landscape and dust that may cause during construction will be coordinately solved in a short period.

- Conclusion:

Additional works utilized from loan savings will supply piped water and improve health's people as well as create more jobs for residents and saving times for water collection.

The environmental impacts are only temporary and will be controlled by the mitigation measures. The residents and local organizations are fully support to the project during implementation.

9 Conclusion

- The Loan Saving Utilization project is a benefit project for living environment, public health, diseases mitigation, jobs creating and economic development.
- The project, however, needs to have environmental monitoring program in the design stage, during construction as well as after construction completion to promote thoroughly the advantages from the project.

Project leaflet

The Rach Gia Water Supply System Project will be loan funded by ADB. This loan has been negotiated by the Government of Vietnam and ADB.

This project is to expand the water supply network to the areas where have urgent demand for clean water. After evaluation, Kien Giang People Committee has decided to expand the clean water coverage toward North West of Rach Gia city to Hon Dat town. This project will supply clean water for the community living along national highway No.80 from Rach Gia city to Hon Dat town and also serves for Hon Dat town residents.

Why is this project necessary to implement?

The community living along National Highway No.80 and Hon Dat town residents are facing to the difficulty in getting clean water. The ground water storages are low, poor quality, high hardness, CT and SO4 concentration are high. The surface water resource is affected by salinity, especially in dry season. In addition, the surface water from Hau river and Vinh Te canal is also affected by hardness characteristic. In the middle and the end of rainy season, water flow from Hau river and causing flood for the area. Consequently, the community has to use the unhygienic water for daily activities and production.

Scope of construction and impact minimization

The construction will include laying **pipeline system** and **2 booster pumping stations**.

The pipeline system

Digging trench to lay the pipe in will be implemented in the public highway and roads in Hon Dat town. The width of trench will be from 0.8m to 1.2m. There will be no impact to properties or houses as well as no land acquisition and resettlement happened.

Time for reinstatement the highway and roads in Hon Dat town will be maximum 10 days after they are excavated. The trench may cause some disturbance for people living along the pipeline when they leave their houses to the highway or roads. Therefore, the contractors will provide timber boards and construction signal boards until the trenches are refilled.

The construction will be followed as rolling style that means the new trench will not be dug until the adjoining trenches are refilled and the surface is reinstated.

2 booster pumping stations

Booster pumping station No. 1 will be located at My Lam Village, Hon Dat district, Kien Giang province. There will be no PPC's decision for land acquisition because the land will be purchased as a usual market transaction.

Booster pumping station No.2 will be located at Son Kien Village, Hon Dat district, Kien Giang province, the PPMU has purchased 3 vacant land plots from Project Management Unit For Residential Site.

How are the construction impacts supervised and monitored

The PPMU will monitor the contractor during construction work. The records of any disturbance to people living along the pipeline will be prepared and a report issued to the PPMU for solution within **7 days**.

The resettlement plan that states clearly all entitlements and mechanism for ensuring there are no people or properties affected during construction has been disclosed at the People Committee of Hon Dat town in Vietnamese and English. Anyone can access this document to understand further about the project and construction work as well as entitlement if any for properties or land affected by construction.

Any persons living in the construction site who are affected by the construction or annoyed by the contractors can contact the PPMU at the following address:

Nguyen Duc Hien - PPMU director

Third Provincial Towns Water Supply and Sanitation Project

The Management Unit of Rach Gia Town Water Supply and Environmental Sanitation Project

206 Mac Cuu, Rach Gia, Kien Giang

Telephone number: 077 872 527

PS 1.06 Notification to Residents, Business and Public

- A The Contractor shall hand deliver to each residence and business in close proximity to the site, a written notice three days in advance of commencing any construction work, including delivery of pipe, which will involve temporary inaccessibility or water shutdown to their properties. Said notice shall state when operations will start and approximately when they will end. The notices shall be printed on A4 paper with wording similar to that shown as follows in Vietnamese and English.

NOTICE

To The People in this area

Within the next few days, work will be started on the construction of the Water Supply Improvements – Major Works serving Hon Dat Town as part of the Third Provincial Towns Water Supply and Sanitation Project. We should complete the work by

*.....
This work may cause some inconvenience but will be of permanent benefit.
We will appreciate your co-operation in the following:*

- please be alert when driving or walking in, or near the construction area;*
- tools, materials, pipe and equipment are attractive to children. For their safety, please keep them away from the construction site;*
- please report all inconvenience to the job superintendent or call the office at the number given below.*

This work is being performed for the Provincial Project Management Unit of Tay Ninh Urban Water Supply and Sanitation, on behalf of the Government of the Socialist Republic of Vietnam by:

(Insert name, address and telephone number of the Contractor in this space)

We will endeavor to complete this work as rapidly as possible and with a minimum of inconvenience to you.

Signed:

Title:

SOCIALIST REPUBLIC OF VIETNAM

**Provincial People's Committee of Tay Ninh
Tay Ninh's Provincial project Management Unit**

Third Provincial Towns Water Supply and Sanitation Project

ADB Loan No. 1880-VIE (SF)

FINAL REPORT

ON

**INITIAL ENVIRONMENTAL EXAMINATIONS
FOR TAY NINH TOWN**

UTILIZATION OF LOAN SAVINGS

December 2008

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INITIAL ENVIRONMENTAL EXAMINATION – TAY NINH SUB-PROJECT

Utilization of Loan Saving

1. Introduction

1.1 Purpose of Report

The purposes of this Initial Environmental Examination is to provide an environmental assessment of the Tay Ninh sub-project for utilization of loan savings, that forms part of the Third Provincial Towns Water Supply and Sanitation Project.

The Project is classified as environmental category B by the Bank, and therefore an Initial Environmental Examination (IEE) is required in accordance with the Bank's guidelines. This IEE for the Tay Ninh sub-project assesses the likely consequences and impacts of the implementation of water and sanitation improvements in Tay Ninh.

1.2 Need for environment Impact Assessment (EIA)

The IEE shows that the Tay Ninh sub-project has brought permanent advantages any population groups in the town. Minor disruption will occur during construction phase, but is temporary in nature. Although some environmental impacts occur during construction of the water and sanitation works, long-term environmental effects are expected to be positive.

The adverse environmental impacts of the Tay Ninh sub-project, and of the Project as a whole, are limited and can be mitigated. Therefore an EIA is not required by the Bank for the sub-project or for the project as a whole.

1.3 Government of Vietnam's EIA

This IEE Report has been prepared to meet the requirements of the ADB, and also provides information that may be used for the Government of Vietnam's (GOV) Environmental Impact Assessment (EIA).

1.4 Identification of Project and Project Proponent

The Tay Ninh sub-project had improved the water and sanitation facilities throughout the urban areas of Tay Ninh provincial town and the adjoining district towns of Hoa Thanh, as part of the Third Provincial Towns Water Supply and Sanitation Project.

The proponent of the Tay Ninh is the Binh Duong Water Supply, and Drainage Company (TNWSDC) responsible for development of water supply and sanitation services in Tay Ninh province.

1.7 Scope of IEE Study

This IEE is based on a study of the impact of the proposed works, together with the findings of the household's survey, as a visual assessment of the general areas that

would be affected by the sub-project, together with workshops and meetings with provincial agencies.

1.8 Study Team

The study team comprised staff of NJS and WASE consultants, including the Team Leader (Mr. William E.Koenig); Deputy Team Leader (Mr. Ngo Nam Hai); Project Engineer (Mr. Vu Tuan Thanh); and WASE's engineers.

The staff of Tay Ninh Water Supply and Drainage Company provided valuable information and assistance to the study team of NIS Consultants and WASE during several visits to Tay Ninh. In particular the assistance of the Director, Mr. Nghiem is gratefully acknowledged.

2. Description of Tay Ninh Sub-Project

2.1 Type of Project

The sub-project includes development of water supply systems to increase coverage in the Tay Ninh region; environmental sanitation improvements, including combined drainage system improvements, increased coverage of septic tanks, school sanitation improvements; a public health awareness program; and development of institutional frameworks and organizations to ensure sustainability.

The Tay Ninh sub-project will consume out water supply system capacity from 7,500m³/day to 18,000 m³/day and increase water supply coverage from 74% to 85% throughout Tay Ninh and Hoa Thanh's urban areas. In addition, this project meets the water demand from people in the central area of Chau Thanh district, Tay Ninh province, with the coverage of 80% approximately.

The number of additional households to receive clean water are:

- Tay Ninh Town, Hoa Thanh District: 5,110 households, and
- Chau Thanh District: 2,000 households.

Utilization of loan saving includes following parts:

- Expansion of distribution network for Tay Ninh town and Hoa Thanh town. Total length of this distribution network:
 - + uPVC pipe D150: 4,200m
 - + uPVC pipe D100: 39,400m
 - + HDPE pipe D50/60: 6,300m
- Construction of water supply plant capacity 1,000 m³/day serving for water demand of center of Chau Thanh district. Total length of distribution network:
 - + uPVC pipe D150: 3,000m
 - + uPVC pipe D100: 1,200m

2.2 Need for Project

The Tay Ninh water treatment plant with a capacity of 18,000 m³/day is under construction (the Third Provincial Towns Water Supply and Sanitation Project), this

is an extremely favorable condition in the addition of supply water source in the town area. However, some areas of towns namely Chau Thanh, Hoa Thanh, and streets of An Duong Vuong, National Highway 22B, Provincial road 786, Tua Hai, Cach Mang Thang Tam ... are shortage of treated water. Under the policy from the Tay Ninh PPC, to get high efficiency from the utilization of loan saving, meeting the domestic use from households and promote the capacity, installation of pipelines for the above streets is needed.

The construction investment from the loan savings will address the urgent needs in the provincial town, Hoa Thanh and Chau Thanh towns for greater access to improved water and sanitation facility. Accordingly, by improving essential infrastructure, the project will situate economic growth and foster investment in the town.

2.3 Location

Tay Ninh town is the capital of Tay Ninh province, and is located on National Highway 22, 90km North-west of Ho Chi Minh city. The town comprises three wards and one commune, covering an area of 33,477 ha.

Tay Ninh province is the South West border province of Vietnam; it is bound on the three sides Cambodia, and its eastern border is formed by the Saigon River. The province is located on the highway linking PhnomPenh and Ho Chi Minh city, two large centers of two countries. Tay Ninh town and nearby Hoa Thanh district town have a close physical relationship, and form the urban center of the province. The total population in Tay Ninh town, the adjoining district town and communes is approximately 200,000.

2.4 Description of Works

Based upon the current loan savings and the necessity of additional investment as mentioned above, additional construction of following works are:

- + Extension of distribution pipelines in Tay Ninh and Hoa Thanh towns. Total length of distribution pipelines are:
 - uPVC pipe D150: 4,200m
 - uPVC pipe D100: 39,400m
 - HDPE pipe D50/60: 6,300m
- + Construction of a water treatment plant capacity 1,000 m³/day to meet domestic use in the central area of Chau Thanh district. Total length of distribution network:
 - uPVC pipe D150: 3,000m
 - uPVC pipe D100: 1,200m

2.5 Proposed Schedule for Implementation

The proposed implementation period is from 2008 to 2009.

3. Description of the Environment

3.1 Physical Resource

Tay Ninh and Hoa Thanh are the administrative, cultural and commercial center of Tay Ninh province. The terrain of both towns is relatively flat, although there are hills and mountains located nearby. Tay Ninh town is located in the transition zone between the midland and plains areas, with an average height of +8m to +10m. The geology consists of unconsolidated sediments, with clays, sand and gravels underlying most of the town areas.

The area surrounding the provincial town and district towns is largely rural, and support sugar cane, rice, rubber, cassava and peanut growing. As a result there are many processing plants in or near the town. Its average annual rainfall is 1,850mm.

Agriculture is significant in Ward 1 and Binh Minh commune.

Tourism also contributes to the economy with many people visiting the Cao Dai temple located on the South of the town boundary, in Hoa Thanh. The main tourist attractions in the area include Tay Ninh Great Temple, BA Den Mountain, and Dau Tieng man-made reservoir, base of the central revolution committee of Southern Vietnam.

3.2 Ecology

There are no known endangered varieties of flora, species of fish or fauna in the areas proposed for development in the Project. Land areas for the proposed water supply and sanitation development have been developed or disturbed previously and have no forest or unusual vegetation cover.

3.3 Human and Economic Development

Population and Communities

By year 2010, the population of Tay Ninh town will be approximately 137, 000 with a further 32,000 in Hoa Thanh district town.

By year 2010, the population in the central area of Chau Thanh district will be approximately 9,895.

Employment and Economic

The urban area of the town serves principally as a service area for the surrounding provincial, rural regions. Its economy is based on the provision of services to provincial or district populations, market trading, light industry and tourism.

Tourism, light industry and food processing are becoming increasingly important to the town's economy. In the Project areas, human and economic development have been constrained by lack of investment and limited infrastructure.

The main sources of employment for men are agriculture, laboring or unskilled works, with some professional and government occupations. Women are engaged in agriculture (especially in ward 1 and Binh Minh commune), services industries and small business. Agricultural and processing industries include sugar cane, rice, rubber, cassava and peanut processing. Tourism also provided limited employment.

Infrastructure

The town has existing water supply system and basic sanitation facilities. Tay Ninh is accessible by road, has power supply from the national grid and has a number of Government offices.

3.4 Items of Archaeological Significance

There are no known sites of historical or cultural significance in the Project area that are likely to be affected during implementation. However, in the detailed investigation and design of water and sanitation works, particular care will be taken to identify historical and cultural sites, and appropriate steps will be taken to protect any such sites.

3.5 Quality of Life

Socio-Economic Values

Tay Ninh has three wards and one commune.

The overall households size for the town is 4.2 persons. Approximately 5.55 of households are classified as poor, ranging from 3.5% in Ward 1 to 7.7% in Ward 3.

The principal ethnic group of the region is the Kinh accounting for 91% of the population, with 7% Chinese and 2% Cham. In Ward 1, a cluster of 60 households from the ethnic Cham group are some of the poorest people in Tay Ninh.

Health Profiles

Tay Ninh and Hoa Thanh's community health profiles are less than satisfactory, water supply and sanitation facilities are inadequate, and pose an environmental health hazard.

The Town Health Office and Department of Health advise that the main illnesses of the town are malnutrition, blood disorder, digestive illnesses, with 40% of women having some gynecological illnesses. The Hoa Thanh District Health Office identified similar illnesses with a low incidence of water born disease, particularly diarrhea, due to a high level of public awareness on the need to boil water from wells before drinking.

4. Screening of Potential Environmental Impacts & Mitigation Measures

4.1 Project Sites

Tay Ninh's water source is multi-propose Dau Tieng Dam, which supplies the town through the Tay canal. The source has adequate yield, but the capacity of its raw water system requires augment. The existing source can safety support the future water demands of the towns to 2010 and beyond.

4.2 Land

Extension of treated water transmission pipelines and construction of Chau Thanh water treatment plant with a capacity of 1,000m³/day by the loan savings generally, along roadways, as a result no additional land acquisition and compensation are needed, the works had been prepared as follows:

a. Extension of distribution pipelines in Tay Ninh and Hoa Thanh towns.

- Most of the distribution pipelines will be laid on the pavements in accordance with the general planning of Tay Ninh town, Hoa Thanh town and Chau Thanh district. Some transmission and distribution pipelines will be laid crossing the roads, passing through the private houses/properties. Therefore, it is necessary to obtain primary agreement with the relevant agencies and private.

b. Chau Thanh water treatment plant

- The proposed land area for construction of Chau Thanh water treatment plant owned by Chau Thanh district. The project owner had agreed with Chau Thanh district and Tay Ninh PPC on using land for construction of Chau Thanh water treatment plant (Decision of chairman of Tay Ninh PPC No. 253/QD-CT) about issuing Right of land use certificate for WSC, now is Tay Ninh Water Supply and Drainage One-Member Co. Ltd.
- The total land area of the site for works for wells and treatment facilities is approximately 1,046 m². The site is located along the public road in a relatively undeveloped area of town. Only an abandoned shack occupies the site.

4.3 Design Aspects

Water quality

Tay Ninh's raw water is obtained from the Dau Tieng dam in the hill, and is of very good quality. The raw water canal from the dam to the town passes through a developed catchment that is used primarily for agricultural activities. However the canal is elevated above the general ground level, thereby minimized the risk of pollution.

Raw water quality of Chau Thanh district (taken from well) is rather good, just a little bit alum. Raw water (from well) passes through treatment plant. Well water reserves of Chau Thanh district was evaluated by Tay Ninh Water Supply and Drainage One-Member Co. Ltd before the preparation of FS. However, canal level is higher than ground level, the risk of pollution can be minimized. To safeguard water quality, all treated water reservoirs will be covered and ventilated and the system operated to ensure that the distribution network is maintained under pressure to minimize potential risk of contamination from polluted groundwater and backflow. Standby generators will be installed at all treatment plant and pumping station site to ensure continuous supply of water at adequate pressure.

Noise

Noise generated by pumping stations and workshops will be minimized by providing thick foundation and bases for equipment, and solid sound-absorbing walls.

Wastewater

The increased quantity of water delivered to the urban areas will generate additional volumes of wastewater that have potential to aggravate the already unsatisfactory condition of much of the existing sanitation and drainage system. The Project included investment in drainage and sanitation, legislative initiative and a public awareness program to ensure that there is no deterioration in existing conditions.

Sludge Disposal

Backwash water from the filters and clarifier will be discharged into sludge lagoons adjacent to the water treatment plant. The sludge will be dewatered in the lagoons and on sludge drying beds and then taken by truck to the town’s landfill. Surplus water from the lagoons and drying bed will be discharged to the drainage system adjacent to the treatment plant, then to the Tay canal, and finally to the Vam Co Dong river in order to ensure the sanitary environment for the area.

4.4 Construction Stage

- Particular Specifications, PS 1.19 - Environmental Mitigation Measures, incorporates the environmental mitigation requirements into the Contract.
- The General Technical Specifications (GS) and Particular Specifications (PS) are referred to for further detail of the mitigation requirements of the Contract.
- Environment monitoring organization is needed in this stage.

Environmental impacts and mitigation measures

Impact	Mitigation measures	Liability	Time	Primary price
<i>Construction stage</i>				
Disruption of water supply due to site works	Announce water supply interruptions two to three days prior to actual cut-off; and complete the connection to the existing system in the shortest possible time. The Contractor’s work program to take into consideration minimal disruption of water supply. Vietnamese Regulations, General and Particular Specifications (PS 1.06)	Contractor – through enforcement of PS 1.06 of the Particular Specifications	Not exceeding 12 hr as required by PS 1.20 – D of Particular Specifications	No additional cost provision made. Penalty beyond 12 hrs is \$500 per day (PS 1.20 – F).
Sludge arising due to wastewater from construction	Construct in dry season	Contractor	During construction	No
Dust due to site works and transport of materials	Water spaying on exposed areas during dry days, provision of truck covers carrying construction	Contractor – through enforcement of Technical Specifications, Section 02221	At time work is being carried out at any section of work and during delivery and	No additional cost provision made.

	materials such as soil, sand etc. as required under Vietnamese Regulations and Technical Specifications Section 02221.		removal of relevant materials.	
Traffic obstruction during excavation of trench for pipe laying	Coordination with local authorities, provision of signs and the other requirements of PS 1.21, Traffic Control	Contractor – through enforcement of PS 1.21	During period works are carried out in each section.	No additional cost provision made.
Noise during construction	As much as possible, activities that generate excessive noise shall be confined to normal daytime working hours.	Contractor – through enforcement of General Specifications, Section 02221	Daytime	No additional cost provision made.
Damage to existing facilities	Agreements for reinstatement have already been signed with the 29 affected parties whose improvements have been affected.	Contractor	Within 10 days	Cost for reinstatement work is included in the Bills of Quantities.
Improper handling and disposal of excavation of spoils causing nuisance, sedimentation of water resources and obstruction of canal and stream flows.	Dispose of excess soil properly and adequately protect temporary soil stockpiles so that these will not be washed away during downpours.	Contractor – through enforcement of General Specifications, Section 02221	During construction	No additional cost provision made.
Safety hazards during construction.	Provide workers with protective clothing including masks, hard hats, gloves, safety shoes, etc. Avoid creation of stagnant water bodies. Provide first aid and medical facilities to workers. Provide adequate protection to the general public such	Contractor – through enforcement of Technical Specifications, 01450, Resettlement Plan requirements, and Vietnamese Regulations.	During construction.	No additional cost provision made.

	as safety barriers and marking of hazardous areas, provision of safe access across the construction site to people whose settlements & access are temporarily severed by pipe laying works.			
Affecting landscape in the area	Good clearance. Tidy up after constructing.	Contractor	During and after construction	No
Affecting agricultural activities	Constructing when finishing cropping.	Contractor	Before and during construction	No

4.5 Operation Stage

- Establish a well-trained management staff with full of management equipment and examine the construction regularly.

Environmental impacts and mitigation measures

Impacts	Mitigation measures	Liability	Time	Primary price
<i>Operation Stage</i>				
Confliction between raw water exploitation needs	Exploit underground water, surface water, not affecting the source of water.	Investigation company for hydrological geology.	Approved by State council of Reserves	No
Increasing erosion at the influent well.	Not happen when exploiting underground water.	Project owner	During and after construction	No
Pollution due to improper disposal of sludge	Not happen due to treatment.	Project owner	During management	No
Increase the volume of wastewater needed to be treated.	Not happen due to treatment.	Project owner	During management	No
Low quality of supplied water.	Periodic examination	Health prevention center.	Regularly	No
Dangerousness due to Chlorine use.	Periodic examination	Department of labor	Regularly	No

- All environmental impacts above have and direct or indirect influence on human, mainly the health and labor productivity of the workers. In addition, accident at work, fire and detonation also have an implicit influence on the workers. Therefore we must take care of safety at work measures, preventive measures of fire and detonation, improve the working condition of laborers.

In general, environmental impacts in this phase are expected to be executed about technique and technology aspects, in order to reduce negative impacts with an acceptable expense. Problems which need to be taken care of is raising the management and control. However, positive impacts which brought from the project is: creating jobs, which bring stable income for many people, training and increasing skill of controlling and operating equipment, high-tech line, creating industrial working style, and above all is meeting the treated water needs, creating conditions for the socio-economic development.

5. Overall Environmental Review

Following the implementation of the Project, which comprises water supply development, environmental sanitation improvement, a public health awareness program and an institution strengthening component. It is expected that those will contribute to an improvement in the quality of life and community health profiles for Tay Ninh.

6. Potential Environmental Enhancement

The most beneficial impact of this Project is the significant improvement to the health, well being and quality of life to the entire community of South Tay Ninh region, who will benefit from having access to a reticulated supply of good quality potable water and also associated improved sanitation infrastructure.

The Project will provide reliable supply of good quality potable water, without which people and industry would have poor quality water and limited supplies.

The Project will replace the existing groundwater system in Hoa Thanh, which is subject to contamination.

7. Institution Requirements and Environmental Monitoring Program

The Provincial Project Management Unit of Tay Ninh Province Water Supply Third Project (PPMU) is the Executing Agency of the project.

The Law on Environmental Protection (1993) and the Decree (175/CP) from the Government on Regulations Implementing the Law on Environmental Protection (1994) empower the PPCs and Government departments to develop and enforce environmental regulations and to evaluate environmental impact assessment report.

Specified measures to be implemented as part of the Project include (i) introduction of legislation to prevent development and environment; harmful activities in the vicinity of surface intakes; (ii) control and monitoring of activities in the catchment upstream of water supply intakes; (iii) enforcement of regulations for treatment and discharge of industrial wastewater; (iv) licensing industrial, commercial and domestic use of ground water in sensitive areas, and banning industrial and commercial use of groundwater in areas where piped water supply is available.

The Government should introduce modified regulations in the Project towns requiring residents and business, commercial and industrial establishments to upgrade their sanitation facilities and to register them with the Tay Ninh WSC 01 member Ltd.

This program, to be developed and implemented by the Tay Ninh Water Supply and Drainage One-Member Co. Ltd, is expected to have a positive impact on the urban environment.

A computerized billing system/management information system will be installed at each WSC to monitor and manage the septic tank in the communities, and serve as a maintenance management system.

Tay Ninh Water Supply and Drainage One-Member Co. Ltd keeps track of the impacts of the project on environment with the participation, supervision of Department of science and technology, Department of Environment and resources of Tay Ninh province. Monitoring programs are:

- Monitoring the quality of raw water: monitoring the quality of raw water is the first standard which is checked daily, shift by shift to ensure adjusting the operating regime, ensure the quality of treated water. The site where we take sample is at water intake. Standards analyzing are: pH, SS, color, E.Coli, with testing frequency is 1 time/shift.
- Monitoring treated water quality: standards are tested daily, fully-analyzing samples are tested monthly to compare with current standard of domestic water. The site where we take sample is at the treatment unit (after finishing each treatment process).
- Monitoring the ambient air quality at treatment plant: monitoring following standards: climate, illumination, dust, noise which inside and outside the workshop with testing frequency is 4 times/year.
- Monitoring waste water which discharged in treatment process, assessing the influence when discharge it to the environment.

Information above is updated, assessed and recorded frequently. If problem break out, we will cooperate with appropriate authorities to have suitable measures.

- The PPMU and the Engineer for the project (NJS Consultants) will monitor implementation of IEE requirements during construction as part of construction supervision for the works.
- The Engineer will report any environmental problems encountered during construction with required remedial actions in the Quarterly Report prepared for the Project and submitted to the PCU, the PPMU and the ADB on a quarterly basis.

8. Public Consultation and Information Disclosure

Project information, including scope of construction, impact minimization, and disclosure information are also made a part of the Resettlement Plan for the project. Tay Ninh PPMU co-ordinated with local authorities of the two communes to hold a public consultation and present project information for IEE as well as the resettlement and compensation for construction water distribution pipelines, i.e.:

- Date and Venue: On 22 October 2008 at the office of Thanh Dien commune PC and on 23 October 2008 at Ninh Son commune PC.
- Participants:
 - Tay ninh PPMU:

1. Mr. Trinh Thanh Nghiem	Director
2. Mr. Nguyen van Trung	Vice Director
3. Mr. Tran Thanh Nguyen	Head of PPMU Office
4. Mr. Vu Tuan Thanh	NJS staff
 - Local Authorities:

1. Mr Nguyen Thanh Tung	Vice Chairman of Thanh Dien commune PC
2. Mr. Pham van Thanh	Head of Hamlet
3. Mr. Tran van Phuoc	Vice Chairman of Ninh Son commune PC
4. Mr. Nguyen Van Khanh Em	Vice Chairman of Long Thanh Bac PC
 - APs:

At the meeting on 22 October 2008:

1. Mr. Nguyen Van Cu	House No. A2/17, Thanh Dien Commune
2. Mr. Nguyen Van Hung	House No. A2/18, Thanh Dien commune
3. Mr. Vo Hoang Ha	House No. A2/24, Thanh Thuan hamlet
4. Ms. Tran Thi Kim Xuan	House No. A2/6, Thanh Thuan hamlet. Thanh Dien commune
5. Mr. Nguyen Van Chinh	House No. A2/8, Thanh Thuan hamlet. Thanh Dien commune
6. Mr. Ho Van Dong	House No. B, Thanh Thuan hamlet.
7. Mr. Nguyen Hoang Duong	House No. B6/10, Thanh Thuan hamlet.
8. Mr. Pham Hung Phi	House No. B5/33, Thanh Thuan hamlet.
9. Mr. Nguyen Van Ty	House No. B4/15, Thanh Thuan hamlet.
10. Ms. Ho thi Loan	House No. A2/5, Thanh Thuan hamlet, Thanh Dien commune
11. Mr. Truong Van Nhiem	House No. B6/9, Thanh Thuan hamlet.
12. Mr. Vo Son Long	House No. B5/31, Thanh Thuan hamlet.
13. Mr. tran Phuoc Tam	House No. B5/29, Thanh Thuan hamlet.
14. Ms. Nguyen Thi Thu Thuy	House No. B5/32, Thanh Thuan hamlet.
15. Mr. Lam Van Son	House No. B6/26, Thanh Thuan hamlet.
16. Mr. Lam Van Lap	House No. B6/27, Thanh Thuan hamlet.
17. Mr. Tran Van Thanh	House No. A2/113, Thanh Thuan hamlet. Thanh Dien commune
18. Mr. Tran Quoc Tuan	House No. B5/28, Thanh Thuan hamlet.
19. Mr. Nguyen Van Quy	House No. A2/9, Thanh Thuan hamlet.
20. Ms. Nguyen Thi Nua	House No. A2/25, Thanh Thuan hamlet. Thanh Dien commune
21. Ms. Tran Thi Van	House No. A2/19, Thanh Thuan hamlet.

At the meeting on 23 October 2008:

- | | |
|--------------------------|---------------------------------|
| 1. Mr. Duong Cong Thuong | House No. A7/8 Long Thoi hamlet |
|--------------------------|---------------------------------|

2. Mr. Nguyen Huu Long	House No. 17/6, Long My hamlet
3. Mr. Truong Huu Phuoc	House No. 17/5, Long My hamlet
4. Mr. Le Tan Hoang	House no. A7/7, Long Thoi hamlet
5. Mr. Nguyen Van Long	House No. Ninh Trung hamlet, Ninh Son commune
6. Mr. Nguyen Van Toan	House No. 14/6 Ninh Trung hamlet, Ninh Son commune
7. Ms. Cao Thi Minh Tam	House No. 230/6 Ninh Trung hamlet, Ninh Son commune
8. Mr. Nguyen Van Toan	House No. 14/7 Ninh Trung hamlet, Ninh Son commune

- Content of the Meeting:

The Director of Tay Ninh PPMU presented:

1. The purpose of the project is to supply piped water for the population: The Provincial Towns Water Supply and Sanitation Project under Loan No. 1880-VIE (SF) ensured to supply clean water for the needs of piped water in Tay Ninh Town, Hoa Thanh District Town and Chau Thanh district town, Chau Thanh district, Tay Ninh province aimed at improving public health and support social-economic development in the area. The proposed implementation period is from quarter 4, 2008 to quarter 4, 2009.

2. The resettlement and compensation for construction of pipelines: all distribution pipelines will be installed on sidewalks complying with the general planning of Tay Ninh Town, Hoa Thanh district town and Chau Thanh district. However, at some locations the pipelines will cross roads or pass through the private houses that affect trees, crops and temporary structures. Tay Ninh PPMU and contractor committed to compensate for trees and crops and reinstate the original surface for affected houses. There is no need for temporary or everlasting resettlement and land acquisition to construct the pipelines but only a little land needed to compensate for trees, crops or temporary structures.

3. Environment impact assessment: The project is mainly construction distribution networks serving piped water for residents in the area, therefore, some impacts may cause during construction as:

- Impact to the landscape of surrounding area at construction site. This is a compulsory and temporary impact.
- Block the activities of some shops and residents when installing the pipelines in front of private houses.

However, those above impacts are small and temporary. Tay Ninh PPMU and the contractor will have some proper actions or management to limit them. After completion, the wastewater discharging from residential area will be low and did not affect the environment because the activities are mainly laying of piped water pipelines.

- Issues, concerns and perception of stakeholders on the proposed project
After the director presenting the project information, concerned parties agreed on the implementing of the project (enclosed herewith agreements between Tay Ninh PPMU and APs)

* Comments of representatives of local authorities:

- Agreed with implementation of the project in order to adequately supply clean water for the needs of water in the area of Tay Ninh Town, Hoa Thanh district town and Chau Thanh district town aimed at improving public health and supporting the social and economic development.
- During the period of construction, there will surely be some impacts on environment but it is only temporary. We propose that the works should be implemented in day time and reinstated them in night time.
- Supporting Tay Ninh PPMU and the contractor to construct as scheduled and coordinate to solve any troubles during implementation.

* The opinions of APs:

- Agreed with the implementation of the project aimed at improving public health and supply piped water for residents in the area.
- During the period of construction, Tay ninh PPMU and the contractor shall reinstate the surface in the earliest time after construction.
- The impacts on trees, crops are not important. The contractor shall mitigate the damages
- Digging trenches to install pipes should be performed in day time.

Generally, local authorities and APs entirely agreed with the implementing the project.

• Issues, concerns addressed under the project:

- A project leaflet was prepared and distributed during consultation and disclosure sessions in the project area. The information disclosure to local authorities and the public will be made 15 days before beginning.
- The contractor shall comply with opinions from local authorities and APs
- Tay Ninh PPMU, supervisors must obtain complaints from APs

9. Conclusion

If implemented in accordance with the proposed design, the Project is not expected to have any significant adverse environmental impact, but will improve human and environmental conditions. The success of the Project will require strong support for the environmental awareness program on the part of the provincial organizations and improved institutional performance in the enforcement of laws and regulations.

It is considered that the proposed sub-project will be environmentally sustainable provided that the recommended environmental management plans are prepared and followed during the detailed design, construction and post construction monitoring phases of the project.

Attachment 1.

Project leaflet	
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<p>The Tay Ninh Water Supply Loan Savings Works will be funded by a loan provided by ADB. This loan has been negotiated by the Government of Vietnam and ADB.</p> <p>This project is to expand the water supply capacity and distribution network to the areas where there remains an urgent demand for clean water. After evaluation, the Tay Ninh Provincial People's Committee has decided to expand the clean water supply capacity and distribution for Tay Ninh Town, Hoa Thanh and Chau Thanh Districts. This project will provide 2 new wells for supply; and provides for a water distribution network to be installed in Tay Ninh Town, Hoa Thanh and Chau Thanh Districts.</p> <p>Why is this project necessary to implement?</p> <p>The community residents in Tay Ninh Town, Hoa Thanh and Chau Thanh Districts are facing difficulty to obtain clean water; and these communities are in need of a clean water supply to enhance the lives of the residents.</p> <p>Scope of construction and impact minimization</p> <p>The construction will include drilling 2 new water wells, treatment and storage for the water produced and laying additional pipelines for distribution in Tay Ninh Town, Hoa Thanh and Chau Thanh Districts.</p> <p><i>The pipeline system</i></p> <p>Digging trench to lay the pipeline in will be implemented along the roads. The width of trench will be from 0.8m to 1.2 m. There will be no permanent impact to properties or houses as well as no land acquisition and resettlement is required. Existing improvements that may be disturbed during construction will be restored in kind.</p> <p>Time for reinstatement the highway and roads in will be maximum 10 days after they are excavated. The trench may cause some disturbance for people living along the pipeline when they leave their houses to the highway or roads. Therefore, the contractors will provide timber boards and construction signal boards until the trenches are refilled.</p>	<p>The construction will be followed as rolling style that means the new trench will not be dug until the adjoining trenches are refilled and the surface is reinstated.</p> <p><i>Chau Thanh Water Supply Station</i></p> <p>2 wells with capacity of 50 m³ m³ will be drilled in Chau Thanh. The water produced will be treated in new treatment facilities to be built and stored in a new 300 m³ reservoir that will be built at the existing Tay Ninh Water Treatment Plant site.</p> <p>How are the construction impacts supervised and monitored</p> <p>The PPMU will monitor the contractor during construction work. The records of any disturbance to people living along the pipeline will be prepared and a report issued to the PPMU for solution within 7 days.</p> <p>The resettlement plan that states clearly all entitlements and mechanism for ensuring there are no people or properties affected during construction has been disclosed at the Provincial People Committee of Tay Ninh. Anyone can access this document at the PPMU, Tay Ninh to understand further about the project and construction work as well as entitlement if any for properties or land affected by construction.</p> <p>Any persons living in the construction site who are affected by the construction or annoyed by the contractors can contact the PPMU at the following address:</p> <p>Third Provincial Towns Water Supply and Sanitation Project- Mr. Trinh Thanh Nghiem, Director, Project Management Unit, Tay Ninh Province Component, 207 Street 30/4, Tay Ninh Town, Tay Ninh Province, Telephone Number: 066 822 240</p>
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Attachment 2.

PS 1.06 Notification to Residents, Business and Public

- A The Contractor shall hand deliver to each residence and business in close proximity to the site, a written notice three days in advance of commencing any construction work, including delivery of pipe, which will involve temporary inaccessibility or water shutdown to their properties. Said notice shall state when operations will start and approximately when they will end. The notices shall be printed on A4 paper with wording similar to that shown as follows in Vietnamese and English.

NOTICE

To The People in this area

Within the next few days, work will be started on the construction of the Water Supply Improvements – Major Works serving Tay Ninh Town as part of the Third Provincial Towns Water Supply and Sanitation Project. We should complete the work by

*This work may cause some inconvenience but will be of permanent benefit.
We will appreciate your co-operation in the following:*

- please be alert when driving or walking in, or near the construction area;*
- tools, materials, pipe and equipment are attractive to children. For their safety, please keep them away from the construction site;*
- please report all inconvenience to the job superintendent or call the office at the number given below.*

This work is being performed for the Provincial Project Management Unit of Tay Ninh Urban Water Supply and Sanitation, on behalf of the Government of the Socialist Republic of Vietnam by:

(Insert name, address and telephone number of the Contractor in this space)

We will endeavor to complete this work as rapidly as possible and with a minimum of inconvenience to you.

Signed:

Title:

SOCIALIST REPUBLIC OF VIETNAM

**Provincial People's Committee of Binh Duong
Binh Duong's Provincial Project Management Unit**

Third Provincial Towns Water Supply and Sanitation Project

ADB Loan No. 1880-VIE (SF)

FINAL REPORT

ON

**INITIAL ENVIRONMENTAL EXAMINATIONS
FOR SOUTH THU DAU MOT TOWN
UTILIZATION OF LOAN SAVINGS**

December 2008

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INITIAL ENVIRONMENTAL EXAMINATION –THU DAU MOT SUB-PROJECT

Utilization of Loan Saving

1 Introduction

1.1 Purpose of the Report on Initial Environmental Examination (IEE)

The purpose of the Initial Environmental Examination (IEE) report is to provide the Environmental Impact Assessment Report for the construction by utilization of loan savings after bidding of the Thu Dau Mot sub-project, a component of the Third provincial towns water supply and sanitation project.

ADB has classified this project as Environment B, and this requires a preparation of an IEE report to the Bank guidelines. IEE report of Thu Dau Mot assesses possible results and impacts of the implementation of the water supply and sanitation improvement in Thu Dau Mot.

1.2 Environmental Impact Assessment (EIA) requirements

The IEE shows that the works built by the loan savings from Thu Dau Mot sub-project has brought the permanent benefits for people in the town. However, some impacts are adverse but not significant and happen in the short time.

In general, Thu Dau Mot sub-project as well as all other sub-projects will be provided with limit measures to mitigate such impacts.

1.3 Environmental Impact Assessment of the Government of Vietnam

The preparation of this IEE report aims to satisfy ADB requirements and provide information that may be used in the EIA of the Government of Vietnam.

1.4 Project identification and the Employer

TDM project has improved the supply, drainage and sanitation works in TDM town and neighboring towns of An Thanh, Lai Thieu, Di An and Binh Chuan.

The Employer is Binh Duong Water supply, Drainage and Environment Co., Ltd, the entity who is responsible for the improvement of water supply, drainage and sanitation services in Binh Duong province.

1.5 Scope of IEE report

The IEE report is a basis for the study of impacts from the new work items, together with household investigation, visual assessment of public areas affected by the project, workshops and meetings with the relevant provincial agencies.

1.6 Survey team

The Employer has supplied valuable information and provided assistance to the survey team of NJS Consultants and WASE to visit TDM many times. We especially appreciate the support of Mr. Thien, Director of Binh Duong Water supply, Drainage and Environment Co., Ltd.

2 Description of Thu Dau Mot sub-project

2.1 Project type

The scope of this sub-project is the expansion of water supply system to increase the service coverage rate in Thu Dau Mot; improvement of environmental sanitation, including public drainage system, increase of number of septic tanks, improvement of school sanitation, public health awareness program, and institutional development to ensure the sustainability.

TDM project has enhanced the capacity of water supply system from 51,000m³/day to 81,000 m³/day and increased the service coverage from 18% to 74% for the urban ward areas of Thu Dau Mot town and nearby towns of districts An Thanh, Lai Thieu, Di An and Binh Chuan.

After project completion, the loan savings (LS) from the main project will be invested to increase the water supply capacity to an additional of 30,000m³/day.

2.2 Needs for the project

At this stage, due to high water demand, Di An water treatment plant has to run overload, exceeding capacity from 30,000 m³/day to 40,000 m³/day.

Current service connections are 17,562 households (full of capacity since the end of 2006)

By the end of the year 2007, when provided with additional capacity of 30,000 m³/day from the ADB project put into operation, it is necessary to last from 3 to 6 months duration for service connection to customers, the new plant will run in over, according to the project plan, the service connection households are proposed of 12,000 to 15,000 with approximately of 75,000 inhabitants (averagely 5 persons/household). Nevertheless, these households have 20 to 40 persons each, these households are more crowded than normal, these are mainly boarding-house for workers from everywhere coming to work for the plants/enterprises in the project area.

In fact, clean water demand of people in the project area is very high. To satisfy almost this demand, the existing system capacity (including 30,000 m³/day of already implemented ADB project) still needs about 37,731 m³/day. Therefore, it is necessary to expand existing system capacity.

For the time being, it is preferable to take advantage of available benefits from ADB underway project (loan savings after bidding, house for the raw and treated water pumping stations, raw water transmission pipeline, which are already built), construction of some work items to expand an additional capacity up to 30,000 m³/day.

At the same time with the investment on some work items in the treatment plant with an additional capacity of 30,000 m³/day and end up to 111,000 m³/day by end 2009, the construction of additional transmission and distribution pipelines is very essential to supply water to consumers, to ensure that the water supply services is reliable and sustainable in the project area.

The investment under LS will care on urgent demand of the town to improve the water supply and drainage works. By finishing essential infrastructure works, this project will enhance the economic growth and stimulate the investment in the town.

2.3 Location

Thu Dau Mot is the provincial town of Binh Duong province. It is located on National Highway 13, at about 40 km from Ho Chi Minh City on the North West. The town includes 5 wards and 5 villages. Binh Duong province was settled in 1997 and has so far 1 provincial town and 6 districts.

South Thu Dau Mot includes Thu Dau Mot provincial town, Thuan An and Di An districts. This is one of the most developed economic zone of South Viet Nam.

2.4 Description of Works

Based on the existing loan savings and the necessity of investment as mentioned above, the following additional works are proposed:

- + Construction of an additional capacity of 30,000m³/day for the plant.
- + Extension of transmission and distribution pipelines
- + Procurement of additional 5,000 sets of meters.
- + Procurement of equipment, rehabilitation of the existing water treatment plant.

2.5 Proposed implementation progress

The proposed implementation period is from 2008 to 2009.

3 Natural, eco-social conditions of the project site for the loan savings

3.1 Natural conditions

Thu Dau Mot is a commune belonging to the South East region of Vietnam, at located 40km from Ho Chi Minh City. The town is situated on the plain lying between the 2 big rivers named Sai Gon, and Dong Nai Rivers. Average rainfall in a year is 1,856mm, and the rainy season is from September to November. Due to the good ground water in quality, it is used by people and industrial properties. However, ground water exploited excessively is likely to cause a lowered water table and poor in quality.

The neighbors of the town are mostly rural areas. There is no considerable resource industry, and agricultural activities in the project site

3.2 Ecology

There are no known endangered varieties of flora, species of fish or fauna in the areas proposed for development in the Project.

Vegetation in the rural areas as well as in the remote areas is cultivated fields or exhausted forest. Environment in this area is heavily destroyed by traffic roads, population development, industry agricultural activities, and other production firms as well.

Land areas for the proposed water supply and sanitation development have been developed or disturbed previously and have no forest or unusual vegetation cover.

3.3 Development of human resource and economy

Population and residential community

With the current growth in population, it is expected that population in the project site is forecasted about 550,000 people by 2010, approximately 4 – 5 persons/household. In which, there are around 150,000 immigrants working for factories in the area.

Employment and economic

The main sources of employment in Thu Dau Mot urban area are mainly services and workers for industrial parks. Thu Dau Mot town and Binh Duong province are rapidly growing with many industrial parks which are developing in sustainability. Industrial development accompanies with development of houses for workers, establishment of low-houses at the side of high buildings.

The main sources of economic activities in Thu Dau Mot include small factories, industrial and processing industries (pottery, medicine, fine arts, textile, shoes, and cashew), services industries, and agriculture. These industries mainly located in Phu Hoa Ward, and Tan An commune.

Infrastructure

Southern Thu Dau Mot area encompasses a road connecting from Ho Chi Minh, national electric grid, and a number of offices of the government administrations located in the district as well as regional administrations. Infrastructure works of the area were and are under construction, especially, roads and sewage systems. Thu Dau Mot Sub-project plays a very important role in the improvement of water supply and sanitation in the area.

3.4 Archaeological Significance

There are no known sites of historical or cultural significance in the Project area that are likely to be affected during implementation. However, in the detailed investigation and design of water and sanitation works, particular care will be taken to identify historical and cultural sites, and appropriate steps will be taken to protect (if any).

3.5 Quality of life

Socio – economic values

Thu Dau Mot is one of the most prosperous areas of the 7 projects, and Binh Duong is a province that received the highest investment in industry. Socio – economy conditions are changing among wards, and districts. There are around 4 -5 people/ household, however, households with a big number of people, and houses grade 4 remain high in southern Thu Dau Mot.

The principal ethnic group of the region is the Kinh accounting for 95% of the population, with 5% Chinese exclusive of immigrant workers from northern Binh Duong, central region of Vietnam, and Mekong Delta coming to work in Thu Dau Mot.

Health profiles

Community health in Thu Dau Mot has been considerably improved; however, water supply and sanitation system are inadequate and pose an environmental health hazard.

The main diseases resulted from water sources include typhoid, diarrhea, dysentery, eyes related diseases, and other water related diseases. People in rural areas often get these kinds of diseases as they mainly use water from driven wells, dug wells, and river.

4 Research on Environmental Impacts & Mitigation Measures

4.1 Screening of environment

Service area of the project is southern Thu Dau Mot which is an urban residential areas and industrial park of Binh Duong province.

- Location: Thu Dau Mot is situated at the end of transition area between highland and plain; lying between the 2 biggest rivers of the South East region named Sai Gon and Dong Nai rivers.
- Topology: tends to become lower and lower to the above mentioned two rivers. Engineering geology is relatively good and very convenient for construction implementation.
- Climate: Thu Dau Mot is in the tropical monsoon area. There are two typical seasons, in which rainy season is from May to November; and dry season is from December to April of the next year. Average annual rainfall is 1,856mm; average temperature is 26,7^oc; and average humidity is 82%.
- Surface water source: Sai Gon and Dong Nai rivers are the two biggest rivers in the South East region, and the main source of water for domestic use, production, agricultural activities, and the whole South East region. Currently, Dong Nai River is the main source of raw water supply for the project.
- Ground water: ground water at this area is primarily shallow ground water with poor reserves (maximum capacity at each well is approximately 10-20 m³/hr), bad quality, high pollution possibility.

4.2 Construction plan site

a. Raw water works.

- Raw water pumping station built in the main project has a left space for installation of additional pumps for expansion of additional capacity of 30,000 m³/day.
- The conveyance of DN800 raw water transmission pipeline laid in the main project has been designed for the capacity expansion.

b. Water treatment unit.

- The site for construction of the additional works is located within the remaining land at the Di An Water Treatment Plant Site. With a remaining area about of 100,000 m², it is adequate area for construction of an additional new water treatment unit (next to the one which completed). The area required for the new works is 13,900 m²; including for additional sludge drying beds.

c. Plan site for pipeline installation.

- The pipelines are all laid in pavements, no clearance is needed. However, surface restoration for these roads is necessary

4.3 Design stage

The mitigation measures during design period:

- Using required land in minimum and taking advantages of state land;
- Out of houses, trees, farm produce, electrical poles...
- Provide the sensible construction methods, very few environmental pollution, minimize the disordered life of people.
- Select potential water source for future without impacts from the urban development.

Water quality

- Water source protection must be done, no domestic and construction wastewater as well as mud and soil must be discharged into the water sources.
- When clean water is conveyed to remote areas, additional Chlorine for residual Chlorine exists in water at the downstream.
- Ensure that the treated water pipes have permanently pressures to avoid infiltration of ground water as well as domestic and industrial wastewater. For the area without stable power source, design of standby generator is needed.

Pay attention: the works shall be designed so as to use construction machine, generator with a little capacities without noise or provide a soundproof method no affect people and operators.

Wastewater

In the utilization of loan savings, no have cost for construction of drains, however, PPMU has a left cost from the main project for the community education and the people's voluntariness in construction of sanitary septic tanks and seepages (*in the circumstance, seepages no impact on drinking water*).

Sludge disposal

Sludge from the clarifiers and backwash water from the filters will discharge into sludge lagoons adjacent to the water treatment plant. The sludge will be dewatered by the lagoons and sludge drying beds; then taken by truck to the town's landfill. Surplus water from the lagoons and drying beds will be discharged to the drainage system in the vicinity of the site; and eventually return to the river.

4.4 Construction stage

- Organization of environment monitoring during construction course is needed.
- Particular Specifications, PS 1.19 – Environmental Mitigation Measures, incorporates the environmental mitigation requirements into the Contract.
- The General Technical Specifications (GS) and Particular Specifications (PS) are referred to for further detail of the mitigation requirements of the Contract.
- Environmental Impacts and mitigation measures are as follows:

Environmental Impacts and Mitigation Measures

Impacts	Mitigation measures	Implemented by	Duration	Primary Price
<i>Construction stage</i>				
Disruption of water supply due to site works	Announce water supply interruptions two to three days prior to actual cut-off; and complete the connection to the existing system in the shortest possible time. The Contractor's work program to take into consideration minimal disruption of water supply. Vietnamese Regulations, General and Particular Specifications (PS 1.06)	Contractor – through enforcement of PS 1.06 of the Particular Specifications	Not exceeding 12 hr as required by PS 1.20 – D of Particular Specifications	No additional cost provision made. Penalty beyond 12 hrs is \$500 per day (PS 1.20 – F).
Sludge generated b wastewater during construction course	Construction in dry season	Contractor	During construction course	No
Dust due to site works and transport of materials	Water spaying on exposed areas during dry days, provision of truck covers carrying construction materials such as soil, sand etc. as required under Vietnamese Regulations and Technical Specifications Section 02221.	Contractor – through enforcement of Technical Specifications, Section 02221	At time work is being carried out at any section of work and during delivery and removal of relevant materials.	No additional cost provision made.
Traffic obstruction during excavation of trench for pipe laying	Coordination with local authorities, provision of signs and the other requirements of PS 1.21, Traffic Control	Contractor – through enforcement of PS 1.21	During period works are carried out in each section.	No additional cost provision made.
Noise during construction	As much as possible, activities that generate excessive	Contractor – through enforcement	Daytime	No additional cost provision made.

	noise shall be confined to normal daytime working hours.	of General Specifications, Section 02221		
Damage to roads.	Immediately restore roads and other areas affected by pipe laying and construction activities.	Contractor – Public Roads: PS 2.11 – A; and Private Roads: PS 2.11 – B.	Within 10 days after work is executed	No additional cost provision made.
Causing damage for the existing facilities	There are no known existing facilities to be reinstated.			
Improper handling and disposal of excavation of spoils causing nuisance, sedimentation of water resources and obstruction of canal and stream flows.	Dispose of excess soil properly and adequately protect temporary soil stockpiles so that these will not be washed away during downpours.	Contractor – through enforcement of General Specifications, Division 1. Section 02221	During construction	No additional cost provision made.
Safety hazards during construction.	Provide workers with protective clothing including masks, hard hats, gloves, safety shoes, etc. Avoid creation of stagnant water bodies. Provide first aid and medical facilities to workers. Provide adequate protection to the general public such as safety barriers and marking of hazardous areas, provision of safe access across the construction site to people whose settlements & access are temporarily severed by pipe laying works.	Contractor – through enforcement of General Specifications, 01450, Resettlement Plan requirements, and Vietnamese Regulations.	During construction.	No additional cost provision made.

Impact on landscape in the project area	Good site arrangement. Clean up after construction completion	Contractor	During and after construction	No
Impact on farming	Construction after harvest	Contractor	Before and during construction course	No

4.5 Operation stage

- Building of a professional management staff, provision of adequate equipment for permanent management and inspection of works.
- Environmental Impacts and mitigation measures are as follows:

Environmental Impacts and Mitigation Measures

Impacts	Mitigation measures	Implemented by	Duration	Primary Price
<i>Operation and Management stage</i>				
Conflicts during take raw water and benefit from water source	Take surface water, no impact on source	Hydrogeology Survey Company	Reserve approved by the State Reserve Council	No
Increase erosion at the inlet pit	Bank consolidation, construction of concrete embankments	Contractor and Employer	Implemented already in the main project	No
Cause pollution, should sludge disposal be inappropriate	No happen because of already treatment	Employer	During management	No
Increase wastewater volume, treatment is required	No happen because of already treatment	Employer	During management	No
Supply water with poor quality, not meeting standards	Periodical examination	Health Institution	Permanently	No
Danger, should Chlorine be used	Periodical examination	Department of Labour	Permanently	No

5. Appraisal of environment

- The Loan Saving Utilization project shall create additional sanitary water, consequently, enhance the people's health, time saving, create jobs for people.
- The environmental impacts are only temporary, happening in short time and controlled by the mitigation measures.

6. Environmental Potential Enhancement

The impact bringing the most benefit of the project is the significant improvement of health, high living standard to the community in the South Thu Dau Mot area. The project will supply water with good in quality for domestic and industrial uses. The

*** *Representative of affected households:***

- Binh Thang commnue, Di An district, Binh Duong province

- | | |
|----------------------|--|
| 1/ Nguyen Thanh Bien | 33/8, Ngai Thang hamlet, Binh Thang commune, Di An |
| 2/ Nguyen Van Thien | 10/2, Trung Thang hamlet, Binh Thang commune, Di An |
| 3/ Nguyen Van Be | 34/8, Ngai Thang hamlet, Binh Thang commune, Di An |
| 4/ Luong Van Hiep | 43/7, Trung Thang hamlet, Binh Thang commune, Di An |
| 5/ Dang van Thuan | 15/11, Trung Thang hamlet, Binh Thang commune, Di An |

- Quarter Binh Duong 2, An Binh commune, Di An district

- | | |
|---------------------|--|
| 1/ Tran Xuan Minh | 7/7, Binh Duong 2 quarter , An Binh commune |
| 2/ Ha Thai Dong | 28/7, Binh Duong 2 quarter, An Binh commune |
| 3/ Do Dung Anh Kiet | 33/7, Binh Duong 2 quarter , An Binh commune |
| 4/ Nguyen Van Tri | 26/7, Binh Duong 2 quarter , An Binh commune |
| 5/ Tran Van Trong | 25/7, Binh Duong 2 quarter , An Binh commune |

- Lai Thieu district town, Thuan An district

- | | |
|---------------------|---|
| 1/ Huynh Thi Mai | 190/3B, Hoa Long quarter, Lai Thieu district town |
| 2/ Nguyen Thi Sen | 190/2, Hoa Long quarter, Lai Thieu district town |
| 3/ Huynh Kim Huong | 190/3A, Hoa Long quarter, Lai Thieu district town |
| 4/Phan Kim Anh | 181/4A, Hoa Long quarter, Lai Thieu district town |
| 5/Nguyen Thanh Liem | 190/3, Hoa Long quarter, Lai Thieu district town |

- Vinh Phu commune, Thuan An district

- | | |
|------------------|--|
| 1/Vo Quoc Yen | 36/5, Hoa Long quarter, Vinh Phu commune |
| 2/ Le Minh Tam | 6/4, Hoa Long quarter, Vinh Phu commune |
| 3/ Tran Van Dung | 23/4, Hoa Long quarter, Vinh Phu commune |
| 4/Tran Vu Phuong | 29/4, Hoa Long quarter, Vinh Phu commune |
| 5/Nguyen Van Lac | 8/9, Hoa Long quarter, Vinh Phu commune |

• **Content of the Meeting:**

The Director of PPMU Binh Duong presented:

1. The purpose of the project is to supply piped water for the population: The Provincial Towns Water Supply and Sanitation Project under Loan No. 1880-VIE (SF) ensured to supply clean water for the needs of piped water in Binh Thang, commune, Binh Duong ward 2, An Binh commune – Di An district, Lai Thieu town, Vinh Phu commune – Thuan An district, Binh Duong province aimed at improving public health and support social-economic development in the area. The proposed implementation period is from quarter 4, 2008 to quarter 4, 2009.

2. The resettlement and compensation for construction of water treatment plant: water treatment plant will be constructed in the clearance area so that resettlement did not require. During construction, all distribution pipelines will be installed on sidewalks complying with the general planning of local government. However, at some locations the pipelines will cross roads or pass through the private houses that affect trees, crops and temporary structures. Binh Duong PPMU and contractor committed to compensate for trees and crops and reinstate the original surface for affected houses. There is no need for temporary or everlasting resettlement and land acquisition to construct the pipelines but only a little land needed to compensate for trees, crops or temporary structures.

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- Impact to the landscape of surrounding area at construction site. This is a compulsory and temporary impact.
- Block the activities of some shops and residents when installing the pipelines in front of private houses....

However, those above impacts are small and temporary. Binh Duong PPMU and the contractor will have some proper actions or management to limit them. After completion, the wastewater discharging from residential area will be low and did not affect the environment because the activities are mainly laying of piped water pipelines.

- Issues, concerns and perception of stakeholders on the proposed project

After the director presenting the project information, concerned parties agreed on the implementing of the project (enclosed herewith agreements between Tay Ninh PPMU and APs)

* Comments of representatives of local authorities:

- Agreed with implementation of the project in order to adequately supply clean water for the needs of water in the area of Binh Thang, commune, Binh Duong ward 2, An Binh commune – Di An district, Lai Thieu town, Vinh Phu commune – Thuan An district aimed at improving public health and supporting the social and economic development.
- During the period of construction, there will surely be some impacts on environment but it is only temporary. We propose that the works should be implemented in day time and reinstated them in night time.
- Provide assistance PPMU and the contractor to construct as scheduled and coordinate to solve any troubles during implementation.

* The opinions of APs:

- Agreed with the implementation of the project aimed at improving public health and supply piped water for residents in the area.
- During the period of construction, PPMU and the contractor shall reinstate the surface in the earliest time after construction.
- The impacts on trees, crops are not important. The contractor shall mitigate the damages
- Digging trenches to install pipes should be performed in day time.

Generally, local authorities and APs entirely agreed with the implementing the project.

- Issues, concerns addressed under the project:

- A project leaflet was prepared and distributed during consultation and disclosure sessions in the project area. The information disclosure to local authorities and the public will be made 15 days before beginning.
- The contractor shall comply with opinions from local authorities and APs
- Binh Duong PPMU, supervisors have to obtain complaints from APs
 - A Project Leaflet was prepared for distribution in South Thu Dau Mot Town and the Di An District during November and December 2008; with a copy of this leaflet included herein (see Attachment 1).
 - Particular Specification PS 1.06 – Notification to Residents, Business and Public, stipulates the notification requirements for the Contractor to notify parties in the proximity to the works temporary inaccessibility or water shutdown to their properties (see Attachment 2).
 - Complaints can be made to the PPMU and the construction supervisors at site. The construction supervisors are responsible for recording and working with the contractor to solve any complaints as soon as possible. If no resolution is reached within 7 days, the construction supervisor will then report to the PPMU and if needed, further report to NJS and the Project Coordination Unit, Hanoi, (PCU).
 - Complaints that are received from the public and notifications issued to the contractor (whether originating from a complaint or issued as part of contract administration) will be entered into the log book at site and issued to the Engineer for monitoring and reporting purposes.

9 Conclusion

- The Loan Saving Utilization project is a benefit project for living environment, public health, diseases mitigation, jobs creating and economic development.
- The project, however, needs to have environmental monitoring program in the design stage, during construction as well as after construction completion to promote thoroughly the advantages from the project.

Project leaflet

The Binh Duong Water Supply Loan Savings Works will be loan funded by ADB. This loan has been negotiated by the Government of Vietnam and ADB.

This project is to expand the water supply capacity and distribution network to the areas where have urgent demand for clean water. After evaluation, the Binh Duong People Committee has decided to expand the clean water supply capacity and distribution for Thu Dau Mot Town . This project will increase the supply of clean water by 30,000 m³; per day; increase water storage by 7,000 m³; expand the transmission and distribution pipeline network by 53.81 km; and provide an additional 5,000 metered service connections.

Why is this project necessary to implement?

The community residents in Thu Dau Mot are facing to the difficulty in getting clean water. The ground water storages are low, poor quality, high hardness, CT and SO₄ concentration are high. The surface water resources in the area are not clean and heavily polluted. Some flooding occurs during the rain season. Consequently, the community has to use the unhygienic water for daily activities and production.

Scope of construction and impact minimization

The construction will include increasing capacity at the Di An Water Treatment Plant and laying additional pipelines for distribution.

The pipeline system

Digging trench to lay the pipe in will be implemented along the roads in Di An and Thu Du Mot Town. The width of trench will be from 0.8m to 1.4 m. There will be no impact to properties or houses as well as no land acquisition and resettlement happened.

Time for reinstatement the highway and roads in will be maximum **10 days** after they are excavated. The trench may cause some disturbance for people living along the pipeline when they leave their houses to the highway or

roads. Therefore, the contractors will **provide timber boards and construction signal boards** until the trenches are refilled.

The construction will be followed as rolling style that means the new trench will not be dug until the adjoining trenches are refilled and the surface is reinstated.

Di An Water Treatment Plant

The water treatment capacity at the Di An Water Treatment Plant will be increased by 30,000 m³ per day; and reservoir storage capacity will be increased by 7,000 m³.

How are the construction impacts supervised and monitored

The PPMU will monitor the contractor during construction work. The records of any disturbance to people living along the pipeline will be prepared and a report issued to the PPMU for solution within **7 days**.

The resettlement plan that states clearly all entitlements and mechanism for ensuring there are no people or properties affected during construction has been disclosed at the People Committee of Binh Duong.. Anyone can access this document at the PPMU to understand further about the project and construction work as well as entitlement if any for properties or land affected by construction.

Any persons living in the construction site who are affected by the construction or annoyed by the contractors can contact the PPMU at the following address:

Third Provincial Towns Water Supply and Sanitation Project-

Mr. Nguyen Van Thien, Director,
Project Management Unit,
Binh Duong Province Component,
Ngo Van Tri Street, Phu Hoa Ward,
Thu Dau Mot,
Binh Duong Province

Telephone Number: 0650 840 055

PS 1.06 Notification to Residents, Business and Public

- A The Contractor shall hand deliver to each residence and business in close proximity to the site, a written notice three days in advance of commencing any construction work, including delivery of pipe, which will involve temporary inaccessibility or water shutdown to their properties. Said notice shall state when operations will start and approximately when they will end. The notices shall be printed on A4 paper with wording similar to that shown as follows in Vietnamese and English.

NOTICE

To The People in this area

Within the next few days, work will be started on the construction of the Water Supply Improvements – Major Works serving South Thu Dau Mot Town and Di An District as part of the Third Provincial Towns Water Supply and Sanitation Project. We should complete the work by

This work may cause some inconvenience but will be of permanent benefit.

We will appreciate your co-operation in the following:

- *please be alert when driving or walking in, or near the construction area;*
- *tools, materials, pipe and equipment are attractive to children. For their safety, please keep them away from the construction site;*
- *please report all inconvenience to the job superintendent or call the office at the number given below.*

This work is being performed for the Provincial Project Management Unit of Tay Ninh Urban Water Supply and Sanitation, on behalf of the Government of the Socialist Republic of Vietnam by:

(Insert name, address and telephone number of the Contractor in this space)

We will endeavor to complete this work as rapidly as possible and with a minimum of inconvenience to you.

Signed:

Title: