E4531 V2 REV

Environmental Management Plan

For

Zhejiang Rural Water Supply and Sanitaion Project

The Foreign Loan Supporting Project Leading Group Office of Zhejiang Province

MAY 2014

Contents

Preface

This Environmental Management Plan (hereinafter referred to as EMP or the Plan) belongs to the overall environmental management plan of *the World Bank Loan Supporting Project for the treatment system of rural domestic sewage and drinking water engineering in Zhejiang Province* and is formulated based on the Overall Report of Environmental Impacts of the World Bank Loan Supporting Project for the Treatment System of Rural Domestic Sewage and Drinking Water Engineering in Zhejiang Province as well as environmental impact reports of each subproject with appropriate supplement and amendment. As an independent document, this EMP covers all environmental protection actions to be implemented respectively in the project design period, the construction period and the operation period and has offered rules of conduct and working framework for the project to execute reduction measures, environmental management and environmental monitoring in the construction period and the operation period.

All subprojects have stood high-qualified feasibility study design and strict environmental impact assessment (EIA), with the view to lessen adverse impacts from project construction on the society and the environment as far as possible and to resolve remaining environmental problems resorting to corresponding environmental cures. With regard to inevitable environmental influences in the project, one set of feasible and practicable environmental prevention plan has been enacted to be applied in the construction period and the operation period. Having been confirmed during environmental impact assessment and put forward reasonably and feasibly in the EMP, these environmental measures are applicable for the project construction period and the operation period.

It is the purpose of the EMP to list out these environmental cures, as well as other measures with respect to supervision and institutions to be performed at the time of project construction and operation, so as to avoid or control negative impacts of the project on the environment; besides, concrete actions to execute these measures will be put forward in the Plan. The EMP will be an important link between the environmental cures and measures confirmed in environmental impacts and EIA, for the purpose to realize the environmental cures and measures by taking actions under the EMP.

The Project is implemented in two stages: the first stage includes 16 subprojects in four counties (cities), namely the short list projects in the Report; the second stage is framework project. The long list projects listed in the Report are the projects finishing environmental impact assessment in this stage; if the projects change in the future, relevant security policy shall be implemented according to the framework documents.

Discussions about the overall **EMP** have been performed by the Project Office of the Zhejiang Province, together with the Subproject Office of AnJi County, Fuyang, Tiantai County and Longquan County, who have jointly expressed approval. In addition, they have assured details included by this overall EMP and promised to implement each and every environmental mitigation measure and environmental management action under the **EMP** during project implementation.

1 Project Description

1.1 Project Background

Zhejiang Province locates on the south wing of Yangtze River Delta in the southeast coastal region in China, facing the East China Sea in east, contacting Fujian in south, connecting with Anhui and Jiangxi in west and bordering on Shanghai and Jiangsu in north. Both the east-west and the south-north linear distance of Zhejiang Province are about 450km and covering a land area of 101,800 km^2, which accounts for 1.06 % of overall national territorial area, and is one of China' smallest provinces as for area. By the end of 2011, the urbanization rate of the entire Zhejiang Province reached 62.3%, which is 11% higher compared with the national average of 51.27%.

At the beginning of 2005, provincial Party committee and provincial government in Zhejiang issued *the Essentials on Balancing Urban-rural Development and Promoting Urban-rural Integration in Zhejiang Province*, where it points out that the social and economical growth in Zhejiang is undergoing a critical period with economic growth style transition, economic reshuffling and social structural transformation and the method is crucial considering how to rapidly promote the process of industrialization, urbanization and marketization and to solve the problems in rural area with relatively weak foundation, hysteretic development and increased pressure on increment. Balancing urban and rural development and promoting urban and rural integration are to uniformly plan and prepare rural-urban economy and society growth, destroy the urban-rural dual structure, integrate all initiatives about industrialization, urbanization and agricultural and rural modernization, put effort into problem resolving about "agriculture, rural area and farmers", shorten rural-urban difference, give full play to the leading role of the urban to the rural, as well as the supporting role of the latter to the former, and realize complementary and harmonious development, as well as common prosperity. Many counties and cities in Zhejiang have executed various material and substantial projects including rural-urban integration of water supply.

In June 2010, it has witnessed the opening of the Seventh Plenary Session of the Twelfth Central Committee of Zhejiang Provincial Party Committee, where, on the basis of the strategic requirements on ecological civilization construction raised in the 17th CPC National Congress, it comprehensively analyzed the situation and tasks, seriously concluded construction experiences about ecological province and initiatively issued the *Decisions about Promoting the Construction of Ecological Civilization in China,* proposing to insist on the eco-province construction plan, adhere to the road of ecologically developing the province, make an ecological Zhejiang with "prosperity, beauty, harmony and health" and strive to be a demonstration zone of national ecological civilization, which, as a result, indicates directions to harmonize economical and social growth and environmental protection from a higher level. In the very same year, in order to coordinate rural-urban development, Zhejiang Province put forward to build beautiful villages and dedicatedly formulated the Action Planning of *the Construction of Zhejiang's Beautiful Villages* (2011-2015), according to which, the Province will strive to build beautiful villages with scientific planning layout, clean and tidy environment, increased business and incomes and civilized mind and body, that are appropriate for living, businesses and

tourism. By 2015, the Province aims for realizing overall job requirements on the construction of beautiful villages in about 70% of all counties, (cities and districts), launching the beautiful village construction plan in more than 60% villages and towns and accomplishing domestic wastewater treatment project in over 70% of rural areas.

With the rapid growth of the economy and the consistent promotion of urbanization in Zhejiang Province, it is increasingly obvious that it is facing insufficient resource and environmental carrying capacity, as well as expanded pressure on pollutants discharge reduction, especially in the vast rural areas, where, with seriously lagging sewage treatment systems, the overall ecological and environmental quality and the production and living quality have been influenced. To accelerate domestic sewage treatment facilities establishment, improve water environment quality and perfect public service level in the rural. To this end, the people's government in Zhejiang plans to borrow a loan of USD 200 million from the World Bank and apply domestic funds of about USD 200 million （RMB 2.329 billion） to carry out the rural sewage treatment program with a total investment of about RMB 2.46 billion in four counties and cities with critical ecological functions and locations, i.e. the AnJi County in the mountainous region north of Zhexi River in Taihu Lake Basin, Fuyang in Hangzhou suburb and the lower reaches of the Qiantang River, the Tiantai County in the mountainous region east of Zhejiang and the upper reaches of Jiaojiang River and Longquan in mountainous region south of Zhejiang and the upper reaches of Ou River, so as to boost new rural development, strengthen sustainable development and improve people’s living standards of small towns and the rural area in these four counties and cities in Zhejiang Province.

1.2 Project Constitution

Taking use of the World Bank loan, the rural domestic sewage treatment system and drinking water engineering in Zhejiang Province covers four counties and cities, i.e. Longquan, Tiantai County, Fuyang and AnJi County, including the perfection project of water supply and drainage in market towns, the decentralized rural sewage treatment and the perfection project of the sewage collection network. 28 subprojects are included.

Totally eight subprojects will be performed in AnJi County, including the perfection of joint water supply and drainage facilities in rural areas in six regions, including Tianzihu Town (9 villages), Meixi Town (19 villages), Tianhuangping Town (11 villages), Banshan Town (10 villages), Xiaofeng Town (18 villages and 3 communities) and the expansion of urban sewage plants (4 villages, 13 communities and rural areas in Xiaofeng Town and Tianhuangping Town). The first package batch of rural sewage treatment project covering 19 decentralized villages and the second package radiating 15 villages. In total, 105 villages are considered. Owner of the project is AnJi Guoyuan Water Co., Ltd and operations taken in the later period is also performed by the same company. See Table 1 for details.

The total number of subprojects to be performed in Fuyang is 9, consisting of the Fuyang sewage treatment project Phase IV, the construction project of joint water supply and drainage facilities in four rural market towns, i.e. Xindeng Town, Dayuang Town, Changkou Town and Longyang Town, two packaged sewage treatment projects in 19 decentralized villages and two packaged sewage interruption

pipeline construction projects in 41 villages. Totally 84 villages are covered by the project: 19 decentralized villages, 41 ones in the sewage interruption pipeline construction project and 24 ones in joint rural market towns. The Owner of the project is Fuyang Water Group Company and operations and maintenances to be taken in the later period are also performed by the same company. See Table 1-2 for details.

The Tiantai County has five subprojects totally, including perfection projects of water supply and drainage system for villages respectively in the north central section, the eastern section and the western section of Tiantai Basin, as well as the packaged sewage treatment project in 49 decentralized villages constructed in the Phase II project. Owner of the project is Tiantai Water Supply Company and operations to be taken in the later period are also performed by the same company. See Table 1-3 for details.

Nine subprojects in total are to be executed in Longquan, including the perfection project of water supply and drainage infrastructure of urban areas, the improvement project of lanes and alleys of urban areas, the perfection project of connection water supply and drainage infrastructure in An'ren, Badu, Xiaomei, Lanju and Zhatian villages, and two rural sewage treatment projects constructed in two phases. Totally 100 villages are considered. Owner of the project is Longquan Township Water-supply Station and Longquan Water-supply and Drainage Co., Ltd and operations and maintenances to be taken in the later period is also performed by these two same units. See Table 1-4 for details.

1.2.1 Source of fund

Gross investment of this investment is RMB 2,463.24 million (including contingencies and financial expense), including a loan worth USD 200 million (RMB 1,231.62 million) from the World Bank (accounting for 50% of the gross investment) and other supporting funds of each county (city).

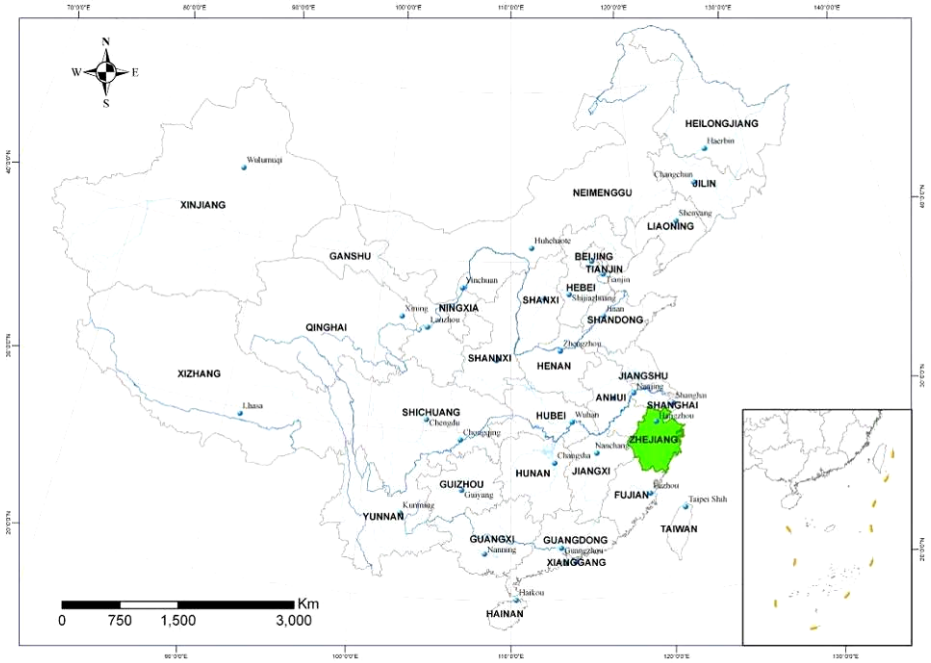

Figure 1-1: Location of Zhejiang Province in China

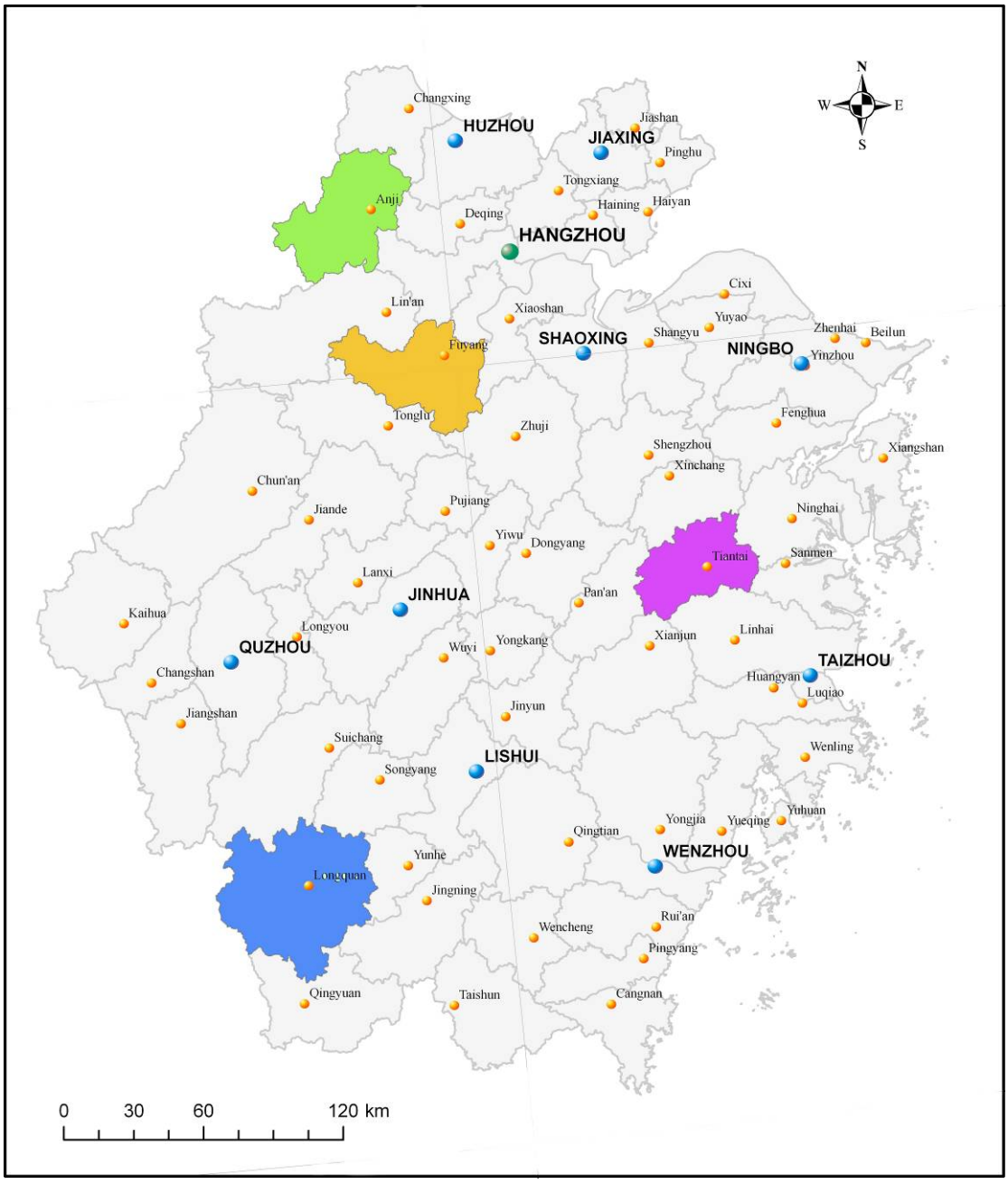

Figure 1-2: Location of the Four Related Counties and Cities in the Project in Zhejiang Province

Table 1-1: Subproject Overview in AnJi County

Subproject No.	Subproject Name	Phase	Engineering Constitution	Construction Unit	Operation and Maintenance Unit
A1	The Perfection Project of Water Supply and Drainage Facilities in Tianzihu Area	Long List	(1) Newly-built water distribution pipelines: 14km, branch pipes for water supply inside the villages: 21km, newly-constructed sewage pipe network: 18km; branch pipes for drainage inside the villages: 27km; (2) Implement drinking water engineering in four natural villages, which will improve regional centralized water supply popularizing rate. Improve and expand the old pipe network in the region. (3) Sewage produced by the nearby 14 natural villages will be discharged into the Tianzihu Sewage Treatment Station through sewage line primarily, in association with decentralized processing.	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.
A2	Perfection Project of Water Supply and Drainage Facilities in Meixi Area	Short List	(1) Gaoyu water plants will be expanded from 20,000m^3/d to 45,000m^3/d, 5000m^3/d West Road water supply booster pump station and 38km water distribution pipelines will be newly built, and 3 natural villages will perfect their water supply pipeline. (2) 32km of sewage pipe network will be newly built, 7 natural villages will implement sewage pipeline connected to each family project at the same time. Meixi Sewage Plants will be expanded from 10,000m^3/d to 20,000m^3/d;	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.
A3	The Perfection Project of Water Supply and Drainage Facilities in Tianhuangping Area	Short List	(1) The newly-built Tianhuagntan booster pump station for water supply will cover 13,000m^3/d; 23km of water distribution pipelines will be newly constructed; 2 natural villages will perfect water supply pipelines; (2) The newly-built sewage pump station will cover 5500m^3/d, 47km of water drainage pipeline will be newly built, and 47 natural villages will implement sewage pipeline connected to each family project at the same time.	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.
A4	Perfection Project of Water Supply and Drainage Facilities in Banshan Area	Short List	(1) The raw water pipeline of the newly-built Banshan water treatment plant is 16km; the newly-built Banshan water treatment plant covers an area of 20,000m^3/d; the newly-built distribution pipes are 12km long; Xiaoyuan Village perfects the village water supply pipeline. (2) The newly-built water drainage pipeline is 14km, and 16 natural villages/communities will implement sewage pipeline connected to each family project at the same time.	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.
A5	Perfection project of water supply and drainage facilities in	Long List	(1) The newly-built water supply and distribution pipe is 47km in length; Jianshan Village perfects the village water supply pipeline. (2) The newly-built water drainage pipeline is 47km, and 66 natural	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.

	Xiaofeng		villages will implement sewage pipeline connected to each family project at the same time.		
A6	Expansion Project of AnJi Urban Sewage Disposal Plant	Long List	(1) The newly-built water supply and distribution pipe is 11km in length;; (2) The newly-built water drainage pipeline is 29km, and 8 natural villages will implement sewage pipeline connected to each family project.; the Sewage Disposal Plant in AnJi will be expanded from 30,000m^3/d to 50,000m^3/d; and the current 30,000m^3/d will be renovated.	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.
A7	Sewage Disposal System for Decentralized Villages in AnJi County (refer to the List of Villages for details)	Short List	50 natural villages under 19 administrative villages will implement decentralized sewage collection and treatment project.	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.
A8	A8: Sewage Disposal System for Decentralized Villages in AnJi County (refer to the List of Villages for details)	Long List	47 natural villages under 15 administrative villages will implement decentralized sewage collection and treatment project.	AnJi Guoyuan Water Co., Ltd.	AnJi Guoyuan Water Co., Ltd.

Table 1-2: Subproject Overview in Fuyang

Subproject No.	Subproject Name	Phase	Engineering Constitution	Construction Unit	Operation and Maintenance Unit
F1	The Fuyang Sewage Treatment Project Phase IV	Short List	(1) The Fuyang Sewage Disposal Plant will be reconstructed from the current Class 1B 80,000m^3/d to the Class 1A 60,000m^3/d; (2) It will be expanded to 80,000t/d, with the yielding water reaching the Class 1A standards.	Fuyang Water Group Company	Fuyang Water Group Company
F2	Perfection project of joint water supply and drainage pipe net for rural area of Fuyang Xindengt	Short List	(1) Rebuild 43km in length; (2) Rebuild and expand sewage pipeline 52.4km in length and rain pipeline 1.6km in length; (3) Implement project to connect water supply pipe (NBF) and sewage pipe to each family in 12 villages.	Fuyang Water Group Company	Fuyang Water Group Company
F3	Fuyang Longyang Sewage Disposal Project	Long List	(1) The newly-built sewage collection is 13.7km in length; (2) The newly-built 1000t/d sewage treatment station is with yielding water of Class 1 Standard. (3) Implement project to connect the sewage pipe to each family in Wanshi and Dongqiao Village.	Fuyang Water Group Company	Fuyang Water Group Company
F4	Perfection project of joint water supply and drainage pipe net for rural area of Fuyang Dayuan	Short List	(1) Rebuild water distribution branch 16.5km in length; (2) Rebuild and expand sewage distribution branch network 32km in length. (3) Implement project to connect the water supply pipe (NBF) and sewage pipe to each family in 9 villages like Dayuantingshan Village.	Fuyang Water Group Company	Fuyang Water Group Company
F5	Perfection project of joint water supply and drainage pipe net for rural area of Fuyang Changkou	Long List	(1) Rebuild water distribution branch 10.13km in length; (2) Rebuild and expand 15.55km sewage branch pipe network	Fuyang Water Group Company	Fuyang Water Group Company
F6	The Fuyang Sewage Interruption Pipeline Construction Project in Rural Areas in Fuyang (The first batch)	Short List	Sewage collection pipe network in 18 villages	Fuyang Water Group Company	Fuyang Water Group Company
F7	The Fuyang Sewage Interruption Pipeline Construction Project in Rural Areas in Fuyang (The second batch)	Long List	Sewage collection pipe network in 20 villages	Fuyang Water Group Company	Fuyang Water Group Company

F8	The Fuyang Sewage Disposal Project in Decentralized Villages in Fuyang (The first batch)	Short List	Sewage collection pipe network in 6 central villages	Fuyang Water Group Company	Fuyang Water Group Company
F9	The Fuyang Sewage Disposal Project in Decentralized Villages in Fuyang (The second batch)	Long List	13 natural villages under 6 administrative villages will implement sewage collection and treatment.	Fuyang Water Group Company	Fuyang Water Group Company

Table 1-3 Subproject Overview in Tiantai County

Subproject No.	Subproject Name	Phase	Engineering Constitution	Construction Unit	Operation and Maintenance Unit
T1	T1: Perfection Project of Water Supply and Drainage System for Rural Area in the North Central Section of Tiantai Basin	Short List	(1) Perfect the sewage collection system (along three streets) in urban areas. The newly built trunk sewers are 20.5km in length; (2) Construct the domestic sewage pipe network system of 31 administrative villages (61 natural villages).	Tiantai Water Supply Company	Tiantai Water Supply Company
T2	T2: Perfection Project of Water Supply and Drainage System for Rural Area in Eastern Section of Tiantai Basin	Long List	(1) Cangshan Sewage Disposal Plant will be newly built with the design size being 5000t/d; as well as arterial drainage. The newly built trunk sewers are 10.5km in length; (2) Install domestic sewage pipe network for 35 villages (57 natural villages).	Tiantai Water Supply Company	Tiantai Water Supply Company
T3	T2: Perfection project of water supply and drainage system for villages in western section of Tiantai Basin	Long List	(1) 8.6km trunk sewer from Jietou Town to Pingqiao Town and one 2000t/d lifting pump station will be erected; (2) Construct the domestic sewage pipe network system of 42 administrative villages (64 natural villages). (3) Connect the main water supply pipes of the village with that within the village.	Tiantai Water Supply Company	Tiantai Water Supply Company
T4	T4: Perfection Project of Water Supply and Drainage System for Decentralized Villages in Tiantai Basin	Short List	Construct the domestic sewage pipe network system of 14 administrative villages (27 natural villages).	Tiantai Water Supply Company	Tiantai Water Supply Company
T5	T5: Perfection Project of Water Supply and Drainage System for Decentralized Villages in Tiantai Basin	Long List	Construct the domestic sewage pipe network system of 43 administrative villages (77 natural villages).	Tiantai Water Supply Company	Tiantai Water Supply Company

Table 1-4: Subproject Overview in Longquan

Subproject No.	Subproject Name	Phase	Engineering Constitution	Construction Unit	Operation and Maintenance Unit
L1	Perfection Project of Water Supply and Drainage Facilities for Urban Areas in Longquan	Short List	(1) The Nandayang Water Plant is expanded from 30,000m^3/t to 50,000m^3/d and the supporting pipelines for water supply is 3.91km long; (2) Construct water supply network off 3.91km, sewage collection pipeline of 4.43km and rain drainage pipeline of 4.11km in the east district of the city;	Longquan Water Supply and Drainage Company	Longquan Water Supply and Drainage Company
L2	Perfection Project of Rural Connected Water Supply and Drainage Facilities in Zhatian Town	Long List	(1) Newly-built raw water pipeline 2.65km, 3000m^3/d water supply plant and water distribution and supply pipeline of 5.6km; (2) Newly-built 500m^3/d sewage treatment station and 15.4km sewage collection network; (3) Serve Zhayi Village, Zhaer Village, Zhasan Village, Xixi Village, Xiawei Village, Xikou Village, Chenshan Village, Donghuang Village and other villages.	Longquan Township Water Supply Station	Longquan Township Water Supply Station
L3	Perfection Project of Rural Connected Water Supply and Drainage Facilities in Xiaomei Town	Short List	(1) Newly-built Xiaomei 3000m^3/d; newly-built raw water pipeline 3.65km, Xiaomei water distribution pipeline 7.75km; (2) Newly-built Xiaomei sewage treatment station 600m^3/d; newly-built water drainage pipeline 8.55m; (3) Serve Meiyi Village, Meier Village, Meisan Village, Meisi Village, Luozhuang Village, Huangnan Village, Maoshantou Village and other villages.	Longquan Township Water Supply Station	Longquan Township Water Supply Station
L4	Perfection Project of Rural Connected Water Supply and Drainage Facilities in Lanju Village	Long List	(1) Newly-built raw water pipeline 1.7km, 3000m^3/d water supply plant, and water distribution pipeline 8.1km; (2) Newly-built 500m^3/d sewage treatment station and 12.9km sewage collection network; (3) Serve Yuzhang Village, Dawang Village, Wumeiyang Village, Mifengling Village, Meiyang Village, Daju Village and Tongshan Village.	Longquan Township Water Supply Station	Longquan Township Water Supply Station
L5	The First Batch of Sewage Disposal Project in Decentralized Villages in Longquan	Short List	(1) Expanded Anren Water Company 4000m^3/d and newly- built water distribution pipeline 8.24km in length; (2) Newly-built Anren Sewage Disposal Station 1800	Longquan Township Water Supply Station	Longquan Township Water Supply Station

			m^3/d ; newly-built drainage pipe 5.87km in length. (3) Serve Xiangbian Village, Liufang Village, Huangtan Village and other villages.		
L6	The Second Batch of Sewage Disposal Project in Decentralized Villages in Longquan	Short List	(1) 4000m^3/d Water Supply Company and 11.4km water distribution pipe; (2) Newly-built sewage disposal station 1300m^3/d and sewage collection pipe network 7.4km in length; (3) Perfect the water supply and drainage facilities in Yi village, Er village, San Village, Si Village and New Village.	Longquan Township Water Supply Station	Longquan Township Water Supply Station
L7	Distributed Rural Sewage Treatment Project in Longquan	Short LIst	Perfect the water supply and drainage facilities in Hecun, Songqu, Xiaohuangnan, Shuita, Dasai, Jibian and Shagnwu.	Longquan Township Water Supply Station	Longquan Township Water Supply Station
L8	Distributed Rural Sewage Treatment Project in Longquan	Long List	Perfect water supply and drainage facilities in 63 distributed villages.	Longquan Water Supply and Drainage Company	Longquan Township Water Supply Station
L9	Lane and Alley Projects in Longquan	Short List	Perfect the water supply and drainage project in 124 places of lanes and alleys.	Longquan Water Supply and Drainage Company	Longquan City Construction Bureau

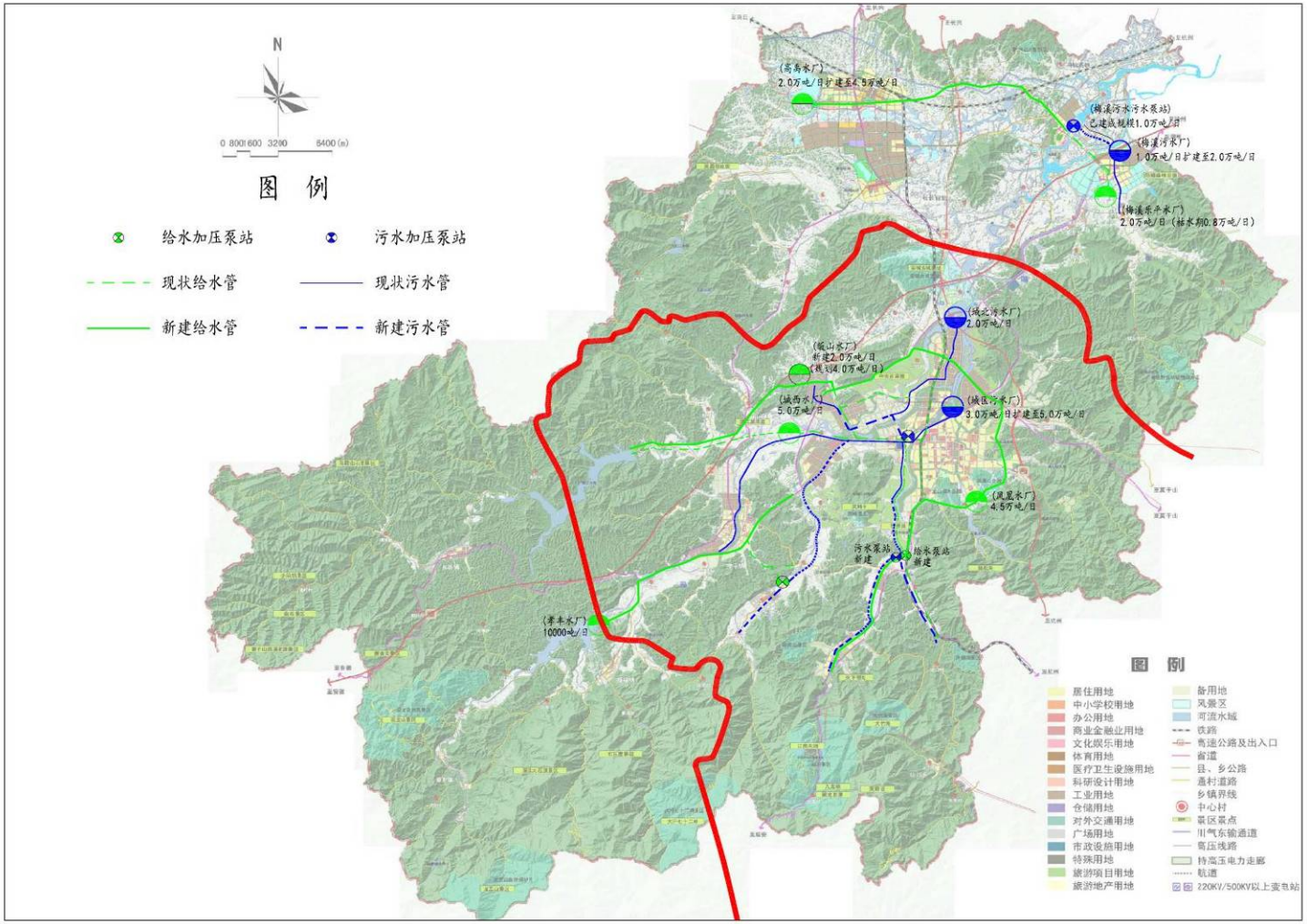

Figure 1-3: Main Subprojects Distribution Diagram in AnJi

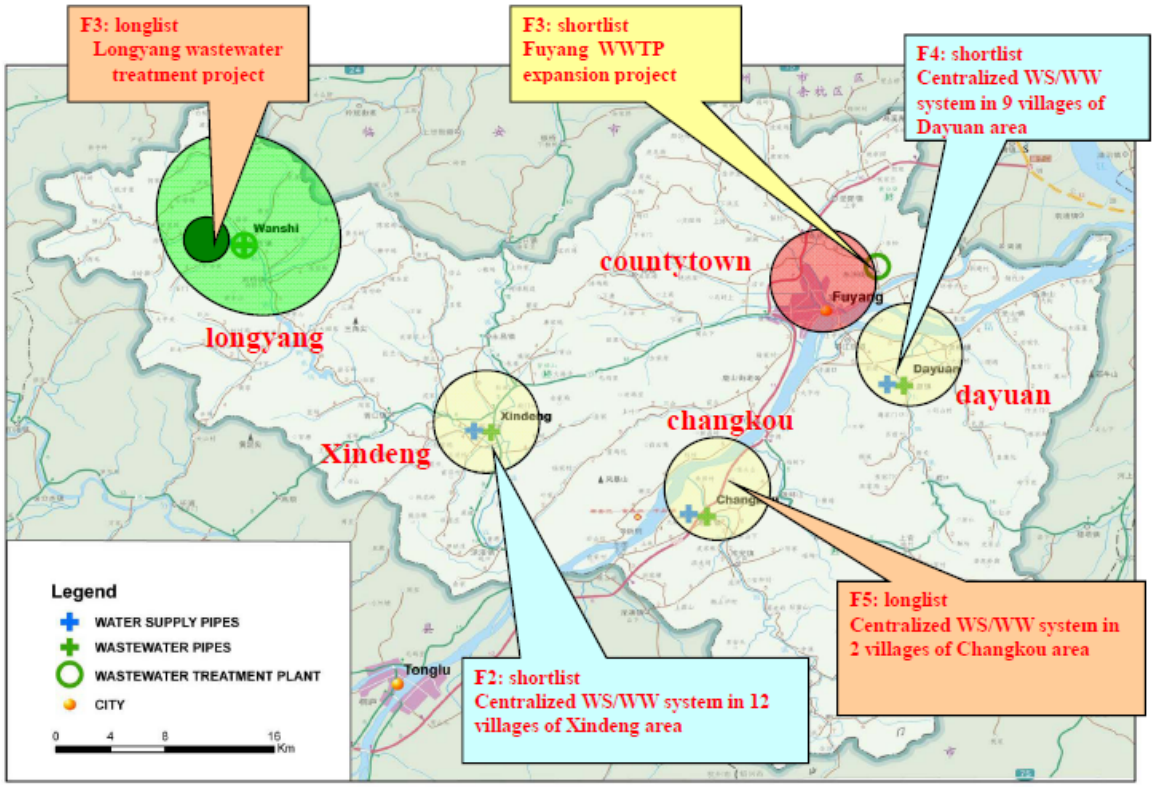

Figure 1-4: Village Joint in four towns of Fuyang and Location Plan of Fuyang Sewage Project Phase IV

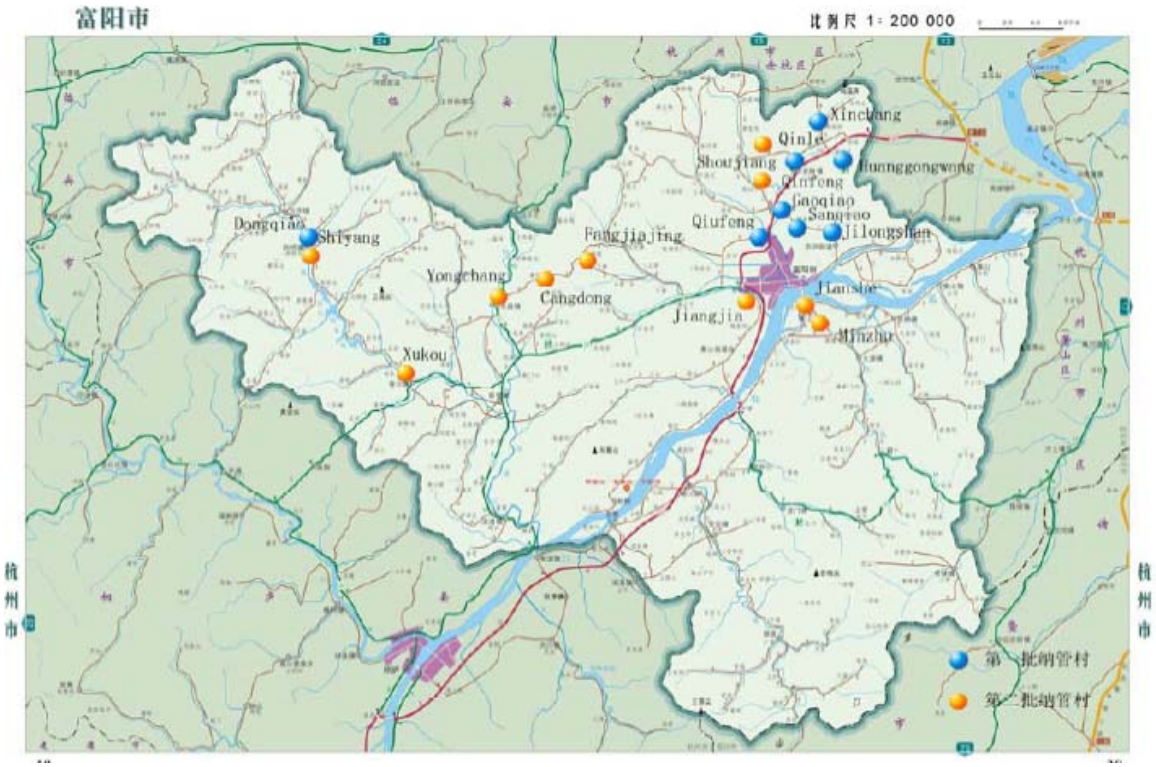

Figure 1-5: Location Plan of Sewage Interception Pipeline in Villages of Fuyang (18 administrative villages and 41 natural villages)

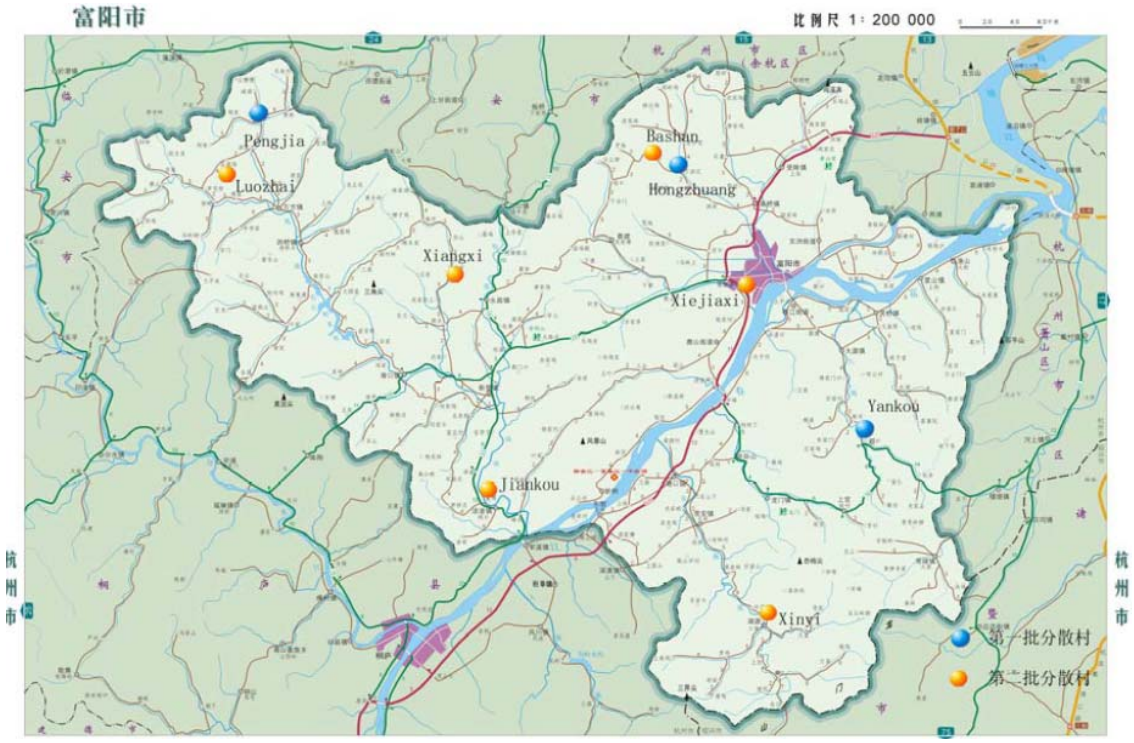

Figure 1-6: Location Plan of Fuyang Decentralized Sewage Disposal Plants in Rural Areas (9 administrative villages and 19 natural villages)

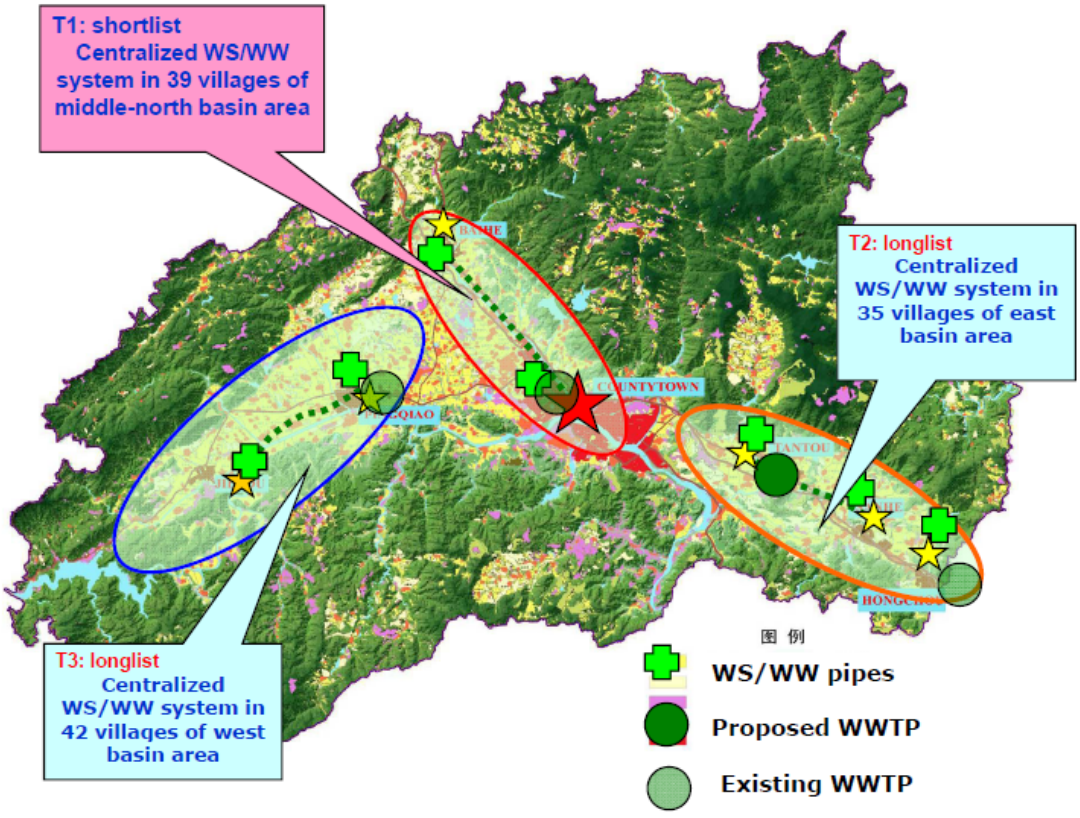

Figure 1-7: Location Plan of 3 Joint Sewage Disposal Systems in Tiantai County

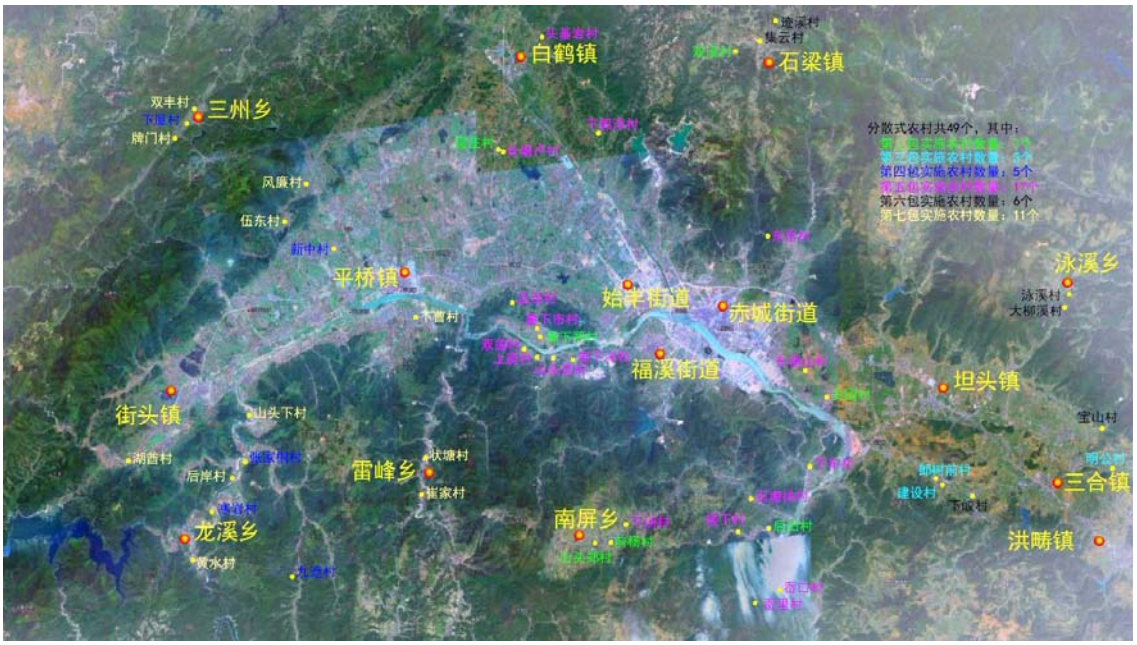

Figure 1-8: Geographical Location Map of Decentralized Villages in Tiantai

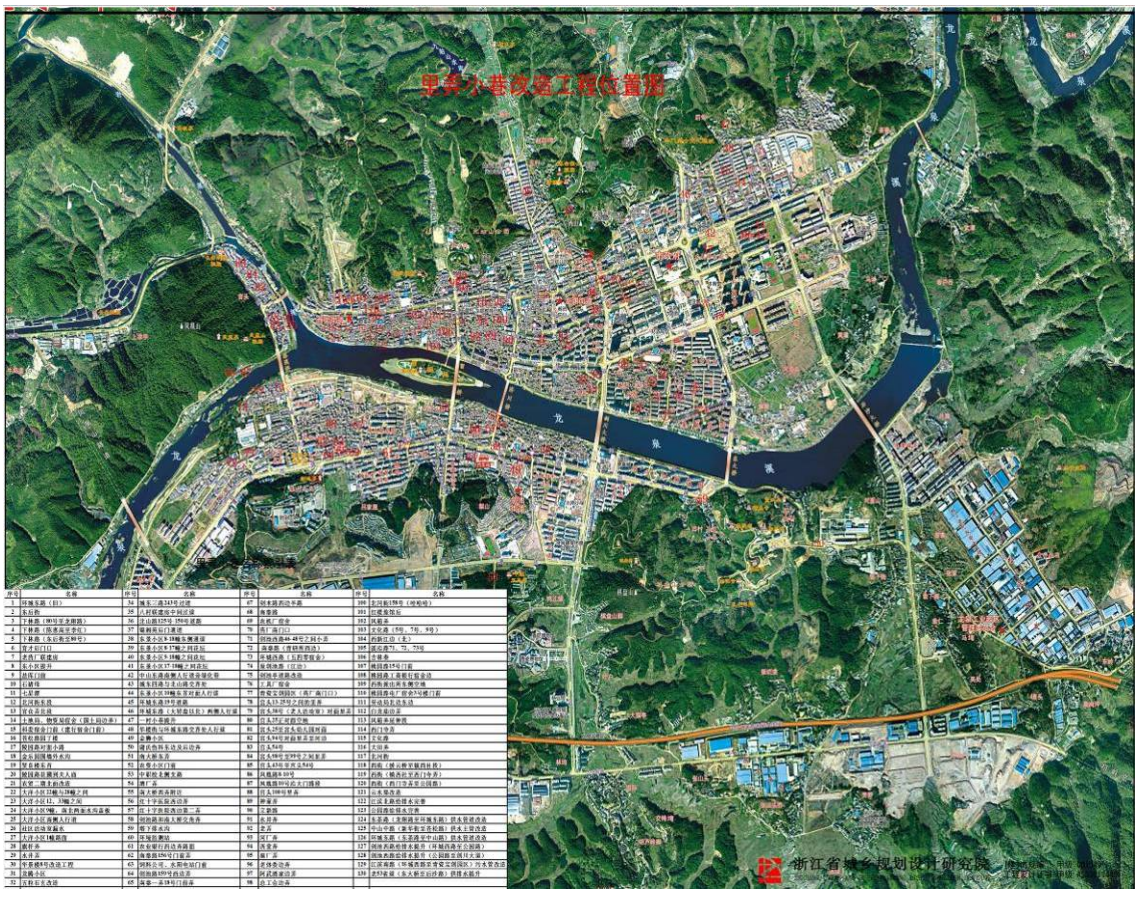

Figure 1-9: Arrangement Diagram of Renovation Project of Lanes and Alleys

Figure 1-10: Location Plan of the First Batch of Sewage Disposal Project in Decentralized Villages of Longquan

Figure 1-11: Location Plan of the Second Batch of Sewage Disposal Project in Decentralized Villages of Longquan

2. Environmental Standards and Environmental Protection Objectives

2.1 Basis of Compilation

2.1.1 Laws, Regulations and Rules

(1) *Environmental Protection Law of the People's Republic of China* (December, 1989);

(2) *Law of the People's Republic of China on Prevention and Control of Water Pollution* (February, 2008 Revision);

(3) *Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution* (September, 2000);

(4) *Law of the People's Republic of China on Prevention and Control of Pollution from Environmental Noise* (October, 1996);

(5) Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste (April, 2005);

(6) *Law of the People's Republic of China on Environment Impact Assessment* (October, 2003);

(7) *Land Administration Law of the People's Republic of China* (October, 1998);

(8) *Law of the People's Republic of China on Water and Soil Conservation* (March 1, 2011);

(9) Highway Law of the People's Republic of China (July, 1997);

(10) *Law of the People's Republic of China on the Protection of Wildlife* (August, 2004);

(11) *Regulations of the People's Republic of China on Wild Plants Protection* (September, 1996);

(12) *Regulations on the Protection of Basic Farmland,* No. 257 Decree by the State Council (December, 1998);

(13) *Regulations on the Administration of Construction Project Environmental Protection* No. 253 Decree by State Council (November, 1998);

(14) *Catalogue for the Classified Administration of Environmental Impact Assessment for Construction Projects* by the Ministry of Environmental Protection, (October, 2008);

(15) *The Decision of the State Council on Implementing the Scientific Development Perspective to Strengthen Environmental Protection* (February, 2006, GF [2005] No. 39)

(16) *Provisional Measures on Public Participation in Environmental Impact Assessment,* State Environmental Protection Administration, (February, 2006);

(17) *Notifications on Further Strengthening Environmental Impacts Assessment Management and Prevent Environmental Risks* (Ministry of Environment Protection [2012, No. 77]), July 3, 2012;

(18) *Notifications on Practically Strengthening the Management of Risks Prevention and Strict Environmental Impacts Assessment* (HF [2012, No. 98]), August 8, 2012;

(19) *Management Methods on Environmental Protection of Construction Projects in Zhejiang Province*, (October 25, 2011);

(20) *Regulations for the Control of Air Pollution in Zhejiang Province*, September 1, 2003;

(21) Regulations on Prevention and Control of Solid Waste Pollution in Zhejiang Province, June

1, 2006;

(22) *Management Methods on the Supervision of Environmental Pollution in Zhejiang Province*, July 13, 2006;

(23) *Notifications on Further Strengthening Pollutants Discharge Reduction Works by the People's Government of Zhejiang Province* (ZHF [2007] No.34), June, 11, 2007;

(24) *Management Methods on Emission Reduction of Total Amount of Main Pollutants in Zhejiang Province* (on trial) (ZHF [2007] No.57), June, 26, 2008;

(25) *Implementation Opinions on Practically Strengthening the Participation of the Public in Environmental Impact Assessment of Construction Projects* (ZHF[2008] No.55), November 6, 2008;

(26) *Notifications on Further Strengthening the Management of Environmental Impact Assessment* (ZHF [2007] No.11), February 14, 2007;

(27) *Serveral Opinions from the General Office of People's Government of Zhejiang Province on the Further Perfection of the Examination and Approval Systems of Environmental Impact Assessment* (ZZBF [2008] No. 59), September 16, 2009;

(28) *Notifications on Further Specify the Environmental Supervision Works of Construction Projects* (ZHF [2009] NO. 80), November 18, 2009;

(29) *Management Methods on Key Ecological Public-welfare Forests in Zhejiang Province* (on trail) (January 18, 2005);

(30) The Notification to Print and Publish *Implementation Plans for Experimental Works of Environmental Supervision of Construction Project in Zhejiang Province* (ZHF [2012] No. 41), May 10, 2012.

2.1.2 Relevant regulations made by World Bank

Securities Policies of World Bank	Does it involve	Introduction
Environmental Assessment (**OP, BP** and **GP4.01**)	Yes	Environmental Impact Assessment is of Class B.
Natural Habitat (**OP/BP4.04**)	No	As for project construction that will be executed in villages and accumulation areas in market towns, where human activities are frequent, with relatively sufficient natural interference, no endangered and rare species are found.
Cultural Heritage Protection (**OP4.11**)	No	No cultural relic protection site exists within the scope of the project construction, but *the Disposal Procedure in case of Cultural Relics Discovery* shall be applied.
Involuntary Inhabitant Resettlement (**OP/BP4.12**)	Yes	The immigration action plan and social evaluation of the project are formulated and compiled by Hehai University.
Dam Safety (**OP/BP4.37**)	Yes	The project construction in AnJi County and Longquan City includes the rebuilding and expanding of existed water plant and the water supply of newly-built water plants. Nine reservoirs and dams in the water resource are involved, including four in AnJi City and five in Longquan City, meeting the dam security assurance policy

		OP4.37 of World Bank. Dam security has been finished by security specialists employed by World Bank.
Ethnic Minorities (**0P4.10**)	No	Project construction does not involve ethnic minorities.
Diseases and Pests Management (**GP4.09**)	No	
Forestry (**OP/GP4.36**)	No	
Projects at Disputed Regions (**OP/BP/GP7.60**)	No	
Projects on International Waterways (**OP/BP/GP7.50**)	No	

2.1.3 Main technical specifications, technical standards and technical materials

(1) *Technical Guide for Environmental Impact Assessment (General Principles),* **HJ2.1-2011;**

(2) *Technical Guide for Environmental Impact Assessment (Acoustic Environment),* **HJ2.4-2009;**

(3) *Technical Guide for Environmental Impact Assessment (Atmospheric Environment),* **HJ2.2-2008;**

(4) *Technical Guide for Environmental Impact Assessment (Surface Water Environment)* **HJ/T 2.3-93;**

(5) *Technical Guide for Environmental Impact Assessment (Ground Water Environment)* **HJ610-2011;**

(6) *Technical Guide for Environmental Impact Assessment (Ecological Environment),* **HJ19-2011;**

(7) *Technical Guide for Environmental Risk Assessment on Construction Project* **(HJ/T169-2004);**

(8) *Technical Specifications to Determinate the Suitable Areas for Environmental Noise of Urban Area*, **GB/T15190-94;**

(9) *Technical Methods for Making Local Emission Standard of Air Pollutants* **(GB/T13201-91), 1991;**

(10) *The Notification on Printing and Publishing Policies of Urban Sewage Disposal and Pollution Prevention and Control Technologies* (JC **[2000] No.124** document by MOC, SEPA, MOST, etc.), **June, 2000**;

(11) *Classification Scheme of the Water Environment Functional Areas at the Water Functional Areas in Zhejiang Province*, by Zhejiang Water Resources Department and Environmental Protection Bureau, **April, 2006;**

(12) Project Construction and Investment Guideline for Rural Drinking Water Source Environment Protection, by Environmental Protection Bureau;

(13) Project Construction and Investment Guideline for Rural Sewage Treatment, by Environmental Protection Bureau;

(14) Classification of Ecological and Environmental Functions in Tiantai County, Classification of Ecological and Environmental Functions in AnJi County, Classification of Ecological and Environmental Functions in Fuyang, Classification of Ecological and Environmental Functions in Longquan City;

(15) Classification of Atmospheric and Environmental Functions in Zhejiang Province.

2.2 Evaluation Criterion and Environmental Protection Objectives

2.2.1 Sewage discharge standard in market towns

In 2006, the former State Environmental Protection Administration also issued a modification list of the *Discharge Standard of Pollutants for Municipal Sewage Disposal Plant,* where it points out that as for water yielded by urban sewage disposal plants to be discharged into key national and provincial river basins, lakes, reservoirs and other enclosed and semi-closed waters, the Class IA standards will be implemented and that when such water is to be discharged into the Class III functional water of surface waters in **GB3838** (except for limited drinking water source protection area and swimming area) and the Class II functional water of seawater in **GB3097**, it will carry out the Class IB standards.

The Notice to Print and Publish the "Twelve-Five" Planning about Prevention and Control of Water Pollution of the Qiantang River Basin by Zhejiang Environmental Protection Department and Zhejiang Provincial Development and Reform Commission specifies that water yield by all urban sewage disposal plants inside the basin will implement the Class 1A emission standards.

Based on above regulations, this project to newly build, renovate and expand sewage disposal stations and plants in market town will be carried out in accordance with the following discharge standards:

1. AnJi at the Taihu Basin: AnJi Urban Sewage Disposal Plant and Meixi Sewage Disposal Plant will follow the Class 1A standards in *Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant.*

2. Fuyang at the Qiantang River Basin: the project fourth phase of Fuyang Sewage Disposal Plant will perform the Class 1A standards in *Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant* and at present, there is another 80,000t/d sewage plant, undergoing upgrading and reconstruction together with it, to improve from Class 1B to 1A. Fuyang Longyang Sewage Station is situated at the upper reaches of the Yanshiling Reservoir and it follows the Class 1A standards in *Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant.*

3. Tiantai at the Jiaojiang River Basin: Tiantai Cangshan Sewage Disposal Plant performs the Class 1B standards in *Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant.*

4. Longquan at the Ou River Basin: sewage disposal stations at Chatian, Xiaomei, Lanju, Anren, Badu and other market towns all locate at the headwater region of the Ou River and the Class 1B standards in Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant shall be complied with.

Table 2-1: Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant

Unit: mg/L, except for pH

Contamination Factor	pH	COD	BOD5	SS	NH3-N*	Petroleum	TP
Class I (standard A)	6-9	50	10	10	5(8)	1	0.5
Class I (standard A)	6-9	60	20	20	8(15)	3	1
Contamination Factor	TN	Total	Total	Hexavalent	Total	Total lead	Total

		mercury	cadmium	chromium	arsenic		copper
Class I (standard A)	15	0.001	0.01	0.05	0.1	0.1	0.5
Class I (standard A)	20	0.001	0.01	0.05	0.1	0.1	0.5
Contamination Factor	Total zinc	LAS	Fecal Coliform				
Class I (standard A)	1.0	0.5	1000 floras/L				
Class I (standard A)	1.0	1	10,000 floras/L				

2.2.2 Sewage discharge requirements of decentralized sewage disposal stations in the rural

1. Rural sewage treatment system construction adopts the treatment process of simple process and convenient operation and maintenance.

2. For the villages out of the water source protection area, the rural domestic sewage shall be discharged through proper process treatment. The following limiting value requirements of pollutant shall be met: CODCr≤100mg/1, BOD5≤30mg/1, TN≤25mg/1 and SS≤30mg/1. When the villages are located near the functional areas of Class III surface water, the outlet water can't discharged directed to the nearby functional water body, but shall be discharged into the local rural ponds, channels and farmland system to form water cycle.

3. The domestic sewage in the water source protection area shall not be discharged after treatment, but shall be treated and diffused through land percolation treatment system.

① The water quality, before entering land percolation treatment system, shall be treated and meet the following pollutant index limit: CODCr ≤ 100mg/L, BOD5 ≤ 30mg/L, NH3-N ≤ 25mg/L, SS ≤ 30mg/L

② Land percolation treatment system shall be designed by selecting proper hydraulic loading and area loading according to the nature of soil. The distance between the border of percolation treatment system and the earth surface water shall be over 50m; the pipeline set of land percolation system shall exceed 1m over the ground water level. If the ground water depth is less than 1m, soil piling methods shall be adopted to make the pipeline set exceed 1m over ground water level.

③ Land percolation treatment system shall monitor the treatment effects. After the finishing of sewage treatment facilities in various water source protection areas, well shall be dug in the place of 10m on the upstream of land percolation treatment field and 50m on the downstream of the percolation treatment system border, in order to monitor the ground water quality. The ground water quality of monitoring well shall meet the Class III standard of *Quality Standard for Ground Water* (GB14848-93). If the background value of original ground water can't meet the Class III standard, the ground water quality at the downstream of the land percolation treatment field shall not exceed the background value of ground water quality at the upstream of monitoring well.

4. Rural domestic sewage water used for farmland irrigation and fishery industry shall meet the regulations in *Standard for Irrigation Water Quality (*GB5084-2005*)* and Water Quality Standard for Fisheries (GB11607-89). The recycling water used for ornamental sight water (riverway) shall meet the requirement regulated in the current national standard: The *Reuse of Urban Recycling Water-Water*

Quality Standard for Scenic Environment Use (GB/T18921-2002).

2.2.3 Other principal environmental standards

1. Environmental Quality Standards for Noise

The standards 4a, 2 and 1 in Environmental Quality Standards for Noise (GB3096-2008) shall be respectively followed for acoustic environment qualities by each subproject and refer to Table 2-2 for details.

Table 2-2 Environmental Quality Standards for Noise (GB3096-2008) unit: dB(A)

Category	Daytime	Night	Basis
1	55	45	*Quality Standards for Acoustic Environment* GB3096-2008
2	60	50	
3	65	55	
4a	70	55	

Boundary noise limits for various sewage disposal plants (stations), water supply plant, sewage (water supply) pumping stations shall respectively observe standards 4a, 2 and 1 in *Emission Standards for Industrial Enterprises Noise at Boundary* (GB12348-2008) and refer to Table 2-3 for details.

Table 2-3 Emission Standards for Industrial Enterprises Noise at Boundary (GB12348-2008) Unit: dB (A)

Category	Daytime	Night
1	55	45
2	60	50
3	65	55
4	70	55

In the construction period, Noise limit at boundary should observe Emission *Standard of Environment Noise for Boundary of Construction Site* (GB12523-2011), as shown in Table 2-4.

Table 2-4 Emission Standards of Environment Noise for Boundary of Construction Site (GB12523-2011) Unit: dB (A)

Daytime	Night
70	55

2. Environmental Quality Standards for Surface Water

Environmental quality standards for surface water shall follow the Class II and III *standards in Environmental Quality Standards for Surface Water* (GB3838-2002), and refer to Table 2-5 for details.

Environmental quality standards for groundwater shall abide by the Class III *standards in Quality Standards for Ground Water* (GB/T 14848-93), and refer to Table 2-6 for details.

Table 2-5 Environmental Quality Standards for Surface Water (GB3838-2002)

Units: mg/L, except for pH

Items on Water Quality	Class II standard	Class III standard
CODcr	15	20
CODMn≤	4	6
DO≥	6	5
BOD5	3	4
pH	6～9	
NH3-N	0.5	1.0
TP	0.1	0.2
Petroleum	0.05	0.05
LAS	0.2	0.2

Items on Water Quality	Class II standard	Class III standard
CODcr	15	20
TN	0.5	1.0
Volatile Phenol	0.002	0.005
Fluoride	1.0	1.0
Mercury	0.00005	0.0001

Table 2-6 *Quality Standards for Ground Water* (GB/T 14848-93)

Item	Class III standard limits	Item	Class III standard limits
pH	6.5~8.5	Nitrite (in N)	≤0.02
CODMn	≤3.0	Nitrate (in N)	≤20
NH3-N	≤0.2	Volatile Phenol	≤0.002
Chloride	≤250	Sulfate	≤250
Copper	≤1.0	Chromium (Sexavalence)	≤0.05
Arsenic	≤0.05	Lead	≤0.05
Fecal Coliform	≤20		

3. Ambient Air Quality Standards

Ambient Air Quality Standards shall abide by the Class II *standard in Ambient Air Quality Standards* (GB3095-2012) and NH3, H2S and other special pollutants shall comply with the maximum concentration limit about hazardous substances in the air of the residential district under Sanitary *Standards for Industrial Enterprise Design* (TJ36-79); please refer to Table 2-7 for details.

As for boundary standards on odor pollutants produced by sewage disposal plants, it needs to be executed complying with the Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant (GB18918-2002); refer to Table 2-8 for details.

Table 2-7 Ambient Air Quality Standards

Name of Pollutant	Obtain time	Standard Concentration Limit (mg/m³)		Basis
		Class I	Class II	
Sulfur Dioxide (SO_2)	Hourly average	0.15	0.50	*Ambient Air Quality Standards* (GB3095-2012)
	Daily Average	0.05	0.15	
	Annual Average	0.02	0.06	
Nitrogen Dioxide (SO_2)	Hourly average	0.240	0.20	
	Daily Average	0.08	0.08	
	Annual Average	0.04	0.04	
Total Suspended Particulates (TSP)	Daily Average	0.12	0.30	
	Annual Average	0.08	0.20	
Inhalable Particle （PM_{10}）	Daily Average	0.05	0.15	
	Annual Average	0.04	0.07	
H_2S	Once	0.01		*Hygienic Standards for the Design of Industrial Enterprises* (TJ36-79)
NH3	Once	0.20		

Table 2-8 *Pollutant Discharge Standards for Urban Sewage Disposal Plant* GB189182002

Maximum Allowable Concentration of Exhaust Emission in Plant Boundaries (Edge of Protected Zone)

Serial No.	Index	Class II standard
1	Ammonia	1.5（mg/m3）
2	Hydrogen Sulfide	0.06（mg/m3）
3	Odor Concentration (Non-dimensional)	20

2.2.4 Protected Objects

See Table 2-9 for major environmental protection objects of each subproject.

Table 2-9 The List of Major Environmental Protection Objects of Each Subproject

No.	Project Name	Major Environmental Protection Objectives
	AnJi Area	
A1	The Perfection Project of Water Supply and Drainage Facilities in Tianzihu Area	1. Seven villages along the pipeline, including Liangpeng Village, Gaoyu Village, Nanbeihu Village Xigang Village, Xiaoyun Village, Zhangzhi Village and Guyuan Village.
A2	Perfection Project of Water Supply and Drainage Facilities in Meixi Area	1. Water quality of Xitiao River; 2. Yangqiao Village 121m away on the east of Gaoyu Water Plant and Gangxi Village 200m away on the west; 3. Lujia Village 30m away on the southwest of the water supply pump station; 4. Shizijian Village 130m away on the southeast of Meixi Sewage Disposal Plant; 5. Caotan Village 125m away on the south of 1# sewage lifting pump station and Longkou Village 66m away on the north; 6. Meixi Village at 85m away from the south of 2# sewage lift pump station; 7. Nineteen villages along the pipe network include Meixi Mark Town as well as Jiazi village, Meixi Village, Longkou Village, Jingwan Village, Huaguang Village, Banqiao Village, Shilong Village, Xiaoshu Village, Dushantou Village, Luxi Village, Hongmiao Village, Zhangwan Village, Xiaoxikou Village, Macun Village, Xilong Village, Houhe Village, Xucunwan Village, Xinfeng Village and Huangdu Village.
A3	The Perfection Project of Water Supply and Drainage Facilities in Tianhuangping Area	1. Eleven villages along the pipe network include Bimen Village, Xiaquan Village, Gangkou Village, Lingfeng Village, Henglu Village, Shanhe Village, Yucun Village, Maji Village, Jingcun Village, Yinkeng Village and Baishuiwan Village.
A4	Perfection Project of Water Supply and Drainage Facilities in Banshan Area	1. Dahouwu Village 97m away on the southwest of and 156m away on the north of Banshan Water Plant 2. Ten villages along the pipe network, including Xiaoyuan Village, Kangshan Village, Shuanghe Village, Changle Community, Wushansi Village, Jiqingqiao Village, Hehuatang Village, Yinwan Village, Sanguan Village and Zhaojiashang Village.
A5	Perfection project of water supply and drainage facilities in Xiaofeng	1. The 21 administrative villages (communities) along the pipeline include Xiaofeng Market Town Area (Xiaofeng Community, Chengbei Community, Dongshan Community), Shiguqiao Village, Zhuguxi Village, Chiwu Village, Fushi Village, Zhugenqian Village, Guanyinqiao Village, Luosifang Village, Banshanchang Village, Liuzhuang Village, Heluxi Village, Dazhuyuan Village, Jianshan Village, Hengshanwu Village, Luocun Village, Shangshu Village, Tiangai Village, Liujiatang Village and Wanmu Village.
A6	Expansion Project of AnJi Urban Sewage Disposal Plant	1. Water quality of Xitiao River; 2. Yingjiatan Village 180m away on the south of the sewage disposal plant, Hehuatang Village 155m away on the northwest and 240m away on the east, and Gaoqiao Village 650m away on the west. 1. Water quality of Xitiao River.
A7	Sewage Disposal System in Decentralized Villages in AnJi	1. Quality of discharged sewage in villages. 2. Nineteen villages are covered by engineering construction including, Jingxi Village, Changlingai Village, Hongmiao Village, Gaojiatang Village, Houhe Village, Shangshugan Village, Zhangcun Village, Dali Village, Majia Village, Tangshe Village, Xiaoxikou Village, Panxi Village, Majianong Village, Wucun Village, Zhangwu Village, Yuhua Village, Hanggai Village, Xilong Village and Jingwu Village.

<table>
<tr><td>No.</td><td>Project Name</td><td>Major Environmental Protection Objectives</td></tr>
<tr><td></td><td>Fuyang Area</td><td></td></tr>
<tr><td>F1</td><td>The Fuyang Sewage Treatment Project Phase IV</td><td>
1. The Fuchun River is the water body to absorb pollutants and main protective objects include intakes of Fuyang Jiangbei Water Plant, Fuyang Jiangnan Water Plant, Zhoupu Water Plant, Yuanpu Water Plant, Xiaoshan Nanpian Water Plant, Xiaoshan Xuxian Water Plant, Jiuxi Water Plant and other surface waters; refer to Figure 1.6-1 for detailed distribution information.
<table>
<tr><th>Name of Sensitive Sites</th><th>Functions of the Water Areas</th><th>Location Corresponding with Discharge Outlets in Phase IV</th><th>Discharge Outlet From discharge outlet (km)</th></tr>
<tr><td>Intake of Fuyang Jiangbei Water Plant</td><td>Centralized domestic drinking water with the water quality of Class II, secondary water source protection area</td><td>Upstream</td><td>4.5</td></tr>
<tr><td>Intake of Fuyang Jiangnan Water Plant</td><td>Centralized domestic drinking water with the water quality of Class II, secondary water source protection area</td><td>Upstream</td><td>6.8</td></tr>
<tr><td>Intake of Zhoupu Water Plant</td><td>Class II water protection area</td><td>Downstream</td><td>12.8</td></tr>
<tr><td>Intake of Zhoupu Water Plant</td><td>Class II water protection area</td><td>Downstream</td><td>16.8</td></tr>
<tr><td>Intake of Xiaoshan Nanpian Water Plant</td><td>Class II water protection area</td><td>Downstream</td><td>16.6</td></tr>
<tr><td>Intake of Xiaoshan Xuxian Water Plant</td><td>Class II water protection area</td><td>Downstream</td><td>17.4</td></tr>
<tr><td>Intake of Jiuxi Water Plant</td><td>Class II water protection area</td><td>Downstream</td><td>26</td></tr>
<tr><td>Confluence of Dayuan River and Fuchun River</td><td>Interface of centralized drinking water of Class II in quality, Grade II water source protection area and Class III multifunctional area.</td><td>Downstream</td><td>4.5</td></tr>
<tr><td>Confluence of Xianpu River and Fuchun River</td><td>Interface of centralized drinking water of Class II in quality, Grade II water source protection area and Class III multifunctional area.</td><td>Upstream</td><td>4.0</td></tr>
</table>
2. Refer to the following Table and Attached Figure 1.6-2 for details about residential areas and schools around the sewage disposal plants.
<table>
<tr><th>Name of Sensitive Sites</th><th>Scale</th><th>Direction</th><th>Distance from the Plant (m)</th></tr>
<tr><td>Minfeng (Jilongshan) Village</td><td>1339 households with 4460 people</td><td>N</td><td>311</td></tr>
<tr><td>Huashu (Huanggongwang) Village</td><td>750 households with 2593 people</td><td>NE</td><td>1771</td></tr>
<tr><td>Fuchunjiang Village</td><td>1347 households with 4800 people</td><td>SE</td><td>468</td></tr>
</table>
</td></tr>
</table>

No.	Project Name	Major Environmental Protection Objectives					
			The First Primary School of Dongzhou	400 persons	N	313	
			Xinsha Village	258 households with 960 persons	S	1698	
			Dongxinmin Village	264 households with 980 persons	W	1121	
			West-suburb Peninsula in Hangzhou	400 households with 1400 persons	W	322	

<table>
<tr><th>No.</th><th>Project Name</th><th>Major Environmental Protection Objectives</th></tr>
<tr><td>F2</td><td>Perfection project of joint water supply and drainage pipe net for rural area of Xindeng Town, Fuyang</td><td>1. The project involves in seven administrative villages, including Tashan Village, Gonghe Village, Bingxian Village, Shuangxi Village, NAnJin Village, Chengzhuang Village, Songxi Village
2. Refer to the following table for water quality of Luzhu River, the water body absorbing pollutants from the Xindeng Sewage Disposal Plant and surrounding residents in Fuyang.
<table>
<tr><th>Environment Factor</th><th>Protection Object</th><th>Direction</th><th>Distance from the Plant (m)</th><th>Distance to the Source of Pollution (m)</th><th>Function/Scale</th></tr>
<tr><td rowspan="7">Ambient air, Ambient Noise</td><td rowspan="3">Shuangta Village</td><td>N</td><td>120</td><td>186</td><td>About one household with four persons in the nearest settlement</td></tr>
<tr><td>W</td><td>150</td><td>208</td><td>About four households with 16 persons in the settlement</td></tr>
<tr><td>N</td><td>About 1800</td><td>About 1866</td><td>About 12 households in the residential area with 48 persons</td></tr>
<tr><td>Xiachaichang Village</td><td>EN</td><td>About 1000</td><td>About 1090</td><td>About 24 households in the residential area with 96 persons</td></tr>
<tr><td>Wokou Village</td><td>S</td><td>About 1800</td><td>About 1880</td><td>About 13 households in the residential area with 46 persons</td></tr>
<tr><td>Guanting Village, Luzhu Town</td><td>WS</td><td>600</td><td>690</td><td>About 76 households in the residential area with 300 persons</td></tr>
<tr><td>Tangjia Village, Xindeng Town</td><td>SE</td><td>About 2200</td><td>About 2300</td><td>About 24 households in the residential area with 84 persons</td></tr>
<tr><td>Water Environment</td><td>Luzhu River</td><td>S</td><td>300</td><td>—</td><td>Class III water quality, Multi-functional area</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Project Name</th><th>Major Environmental Protection Objectives</th></tr>
<tr><td>F3</td><td>Fuyang Longyang Sewage Disposal Project</td><td>1. Please refer to the following table for details about Gexi River, the water body absorbing pollutants.
<table>
<tr><th>Protected object</th><th>Positional relation with this project</th><th>Location</th><th>Controlling target</th></tr>
<tr><td>Yanshiling Reservoir</td><td>Downstream</td><td>3.6km</td><td>Class II</td></tr>
<tr><td>Gexi River</td><td>Water body absorbing pollutants</td><td>From the source (Zhanglinwu) to Yanshiling Reservoir</td><td>Class II</td></tr>
</table>
2. Refer to the following table for villages around the sewage disposal plant, including Chenlin Village, Mujiawu Village, FAnJia Village and Dongqiao Town Kindergartner.
<table>
<tr><th>Name of Sensitive Sites</th><th>Structure</th><th>Distance</th><th>Orientation Relative to Structures</th></tr>
<tr><td rowspan="2">Chenlin Village
(Totally 71 households with a total population of 186)</td><td>To the north boundary</td><td>260</td><td rowspan="2">North</td></tr>
<tr><td>to pre-treatment structure</td><td>285</td></tr>
<tr><td rowspan="2">FAnJia Village
(Totally 23 households with a total population of 62)</td><td>To the south boundary</td><td>900</td><td rowspan="2">South</td></tr>
<tr><td>to pre-treatment structure</td><td>915</td></tr>
<tr><td rowspan="2">Mujiawu Village
(Totally 42 households with a total population of 120)</td><td>To the north boundary</td><td>680</td><td rowspan="2">North</td></tr>
<tr><td>to pre-treatment structure</td><td>705</td></tr>
<tr><td rowspan="2">Dongqiao Town Kindergartner
(Equipped with 34 faulty members and 108 children)</td><td>To the north boundary</td><td>320</td><td rowspan="2">North</td></tr>
<tr><td>to pre-treatment structure</td><td>335</td></tr>
</table></td></tr>
<tr><td>F4</td><td>Perfection project of joint water supply and drainage pipe net for rural area of Dayuan Town, Fuyang</td><td>1. The project involves in Dayuan Village (merged by the original Yongqing Village, Pantang Village, Pudong Village, Xialang Village and Wangxian Village) and Tingshan Village (merged by the original Dongsheng Village, Tayan Village, Zhenlong Village and Tingshan Village).
2. Water quality of Dayuan River, the water body absorbing pollutants from Dayuan Sewage Disposal Plant in Fuyang.</td></tr>
<tr><td>F5</td><td>Perfection project of joint water supply and drainage pipe net for rural area of Changkou Town, Fuyang</td><td>1. Changkou Village and Yesheng Village in Changkou Town
2. Water quality of Huyuan River</td></tr>
<tr><td>F6</td><td>Sewage Interruption Pipeline Construction Project in Rural Areas in Fuyang</td><td>1. The project is totally related with eight administrative villages, including Huanggongwang Village and Jilongshan Village in Dongzhou Subdistrict,, Qiufeng Village and Sanqiao Village in Fuchun Subdistrict, Gaoqiao village, Shouxiang Village and Xinchang Village in Yinhu Subdistrict and Dongqiao Village in Dongqiao Town.</td></tr>
<tr><td>F7</td><td>Sewage Disposal Project in Decentralized Villages in Fuyang (The First Batch)</td><td>1. Water quality of Baiyang River, Nanxin River and Taiyuan River, water bodies absorbing pollutants
2. Hongzhuang Village in Subdistrict Yinhu, Pengjia Village in Wanshi Town and Yankou Village in Dayuan Town</td></tr>
<tr><td></td><td>Tiantai Area</td><td></td></tr>
<tr><td>T1</td><td>Improvement project of water supply and drainage system for cities and villages in</td><td>Thirty nine villages along the pipeline and the tertiary protection area as well as perimeter protection zone of Tiantaishan Scenic Area, which the pipelines have passed through.</td></tr>
</table>

<table>
<tr><th>No.</th><th>Project Name</th><th>Major Environmental Protection Objectives</th></tr>
<tr><td></td><td>the north central district of Tiantai Basin</td><td></td></tr>
<tr><td>T2</td><td>Improvement project of water supply and drainage system for villages in eastern district of Tiantai Basin</td><td>1. Water quality of Cangshandao River, the water body absorbing pollutants
2. Residential areas surrounding Cangshan Sewage Disposal Plant (including Yushan Village, Shishan Village, Xiaaoqiu Village, Hu’an Village and Xili Village).
3. Thirty five villages along the pipeline, such as Wubai Village</td></tr>
<tr><td>T3</td><td>Improvement project of water supply and drainage system for villages in eastern district of Tiantai Basin</td><td>Forty two villages along the pipeline, such as Bajiaoting Village, and the Shifeng Stream, a drinking water source protected area.</td></tr>
<tr><td>T4</td><td>Improvement project of water supply and drainage system for decentralized villages in Tiantai Basin</td><td>1. Quality of water body for sewage discharge in rural areas: Zhangjiatong Village and Hanyan Village locate in the primary drinking water protection area of Shifeng River and Shuangxi Village locates in the primary drinking water protected area of Bai River
2. Beixiazheng Village, Zhangjiatong Village, Jiujiuzhe Village, Shuangxi Village and Hanyan Village locate in the tertiary protection area or the perimeter protection zone of Tiantaishan Scenic Area.
3. The project construction involves in 49 villages such as An’gu Village.</td></tr>
<tr><td></td><td>Longquan Area</td><td></td></tr>
<tr><td>L1</td><td>Improvement project of water supply and drainage facilities for urban areas in Longquan (including projects of lanes and alleys)</td><td>1. Water quality of Longquan River</td></tr>
<tr><td>L3</td><td>Promotion Project of Water Supply and Drainage Facilities in Anren Town</td><td>1. Water quality of Anren River
2. Refer to the following table for details about residential areas such as the Huangshixuan Village around the sewage plant.
<table>
<tr><th>Item</th><th>Protected object</th><th>Orientation</th><th>Closest distance (m) from boundaries of the project</th><th>Scale</th></tr>
<tr><td>Atmosphere</td><td>Huangshixuan Village</td><td>W</td><td>350</td><td>6 households</td></tr>
<tr><td>Surface Water</td><td>Water body absorbing pollutants: Anren River</td><td>/</td><td>15m</td><td>Medium River</td></tr>
</table></td></tr>
<tr><td>L4</td><td>Promotion Project of Water Supply and Drainage Facilities in BaduTown</td><td>1. Water quality of Badu River, the tributary of Longquan River
2. Refer to the following table for details about four settlements such as Xiaogao Village and Badusi Village near the sewage disposal plant.
<table>
<tr><th>Item</th><th>Protected object</th><th>Orientation</th><th>Closest distance (m) from boundaries of the project</th><th>Scale</th></tr>
<tr><td>Atmosphere</td><td>Xiaogao Natural Village</td><td>NE</td><td>350</td><td>5 households</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No.</th><th>Project Name</th><th>Major Environmental Protection Objectives</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>Badu Sicun Village</td><td>SW</td><td>500</td><td>12 households</td></tr>
<tr><td>Surface Water</td><td>Water body absorbing pollutants: Badu River</td><td>/</td><td>15m</td><td>Medium River</td></tr>
</table>
</td></tr>
<tr><td>L5, L6</td><td>Sewage Disposal Project in Decentralized Villages in Longquan</td><td>
1. Water quality of Xiaomei River and Longquan River
2. Refer to the following table for details about residential areas such as Chasan Village near the Chatian Sewage Plant.
<table>
<tr><th>Item</th><th>Protected object</th><th>Orientation</th><th>Closest distance (m) from boundaries of the project</th><th>Scale</th></tr>
<tr><td rowspan="2">Atmosphere, Noise</td><td rowspan="2">Chasan Village</td><td>E</td><td>55</td><td>14 households</td></tr>
<tr><td>S</td><td>35</td><td>2 households</td></tr>
<tr><td>Surface Water</td><td>Water body absorbing pollutants: Xiaomei River</td><td>/</td><td>3m</td><td>Medium River</td></tr>
</table>
3. Refer to the following table for details about residential areas such as Xiaomei Sicun Village, Chenshankeng Village and Wudunliao Village near Xiaomei Sewage Plant.
<table>
<tr><th>Item</th><th>Protected object</th><th>Orientation</th><th>Closest distance (m) from boundaries of the project</th><th>Scale</th></tr>
<tr><td rowspan="3">Atmosphere</td><td>Xiaomei Sicun Village</td><td>SE</td><td>500</td><td>36 households</td></tr>
<tr><td>Chenshankeng Natural Village</td><td>SW</td><td>400</td><td>8 households</td></tr>
<tr><td>Wudunliao Natural Village</td><td>W</td><td>210</td><td>23 households</td></tr>
<tr><td>Surface Water</td><td>Water body absorbing pollutants: Xiaomei River</td><td>/</td><td>10m</td><td>brook</td></tr>
</table>
4. Refer to the following table for details about residential areas such as Wumeiyang Village near Lanju Sewage Plant.
<table>
<tr><th>Item</th><th>Closest distance (m) from boundaries of the project</th><th>Orientation</th><th></th><th>Scale</th></tr>
<tr><td rowspan="2">Atmosphere, Noise</td><td rowspan="2">Wumeiyang Village</td><td>SE</td><td>500</td><td>6 households</td></tr>
<tr><td>W</td><td>300</td><td>26 households</td></tr>
<tr><td>Surface Water</td><td>Yuzhang River</td><td>/</td><td>10m</td><td>Medium River</td></tr>
</table>
5. Decentralized villages for sewage disposal including Zhuanghe Village, Shangwu Village, Jibian Village, Songqu Village, Xiaohuangnan Village, Shuita Village and Dazhai Village
</td></tr>
</table>

2.3 Environmental Impact Assessment Result

2.3.1 Present of environmental quality condition

1. The quality objectives of surface water environment

(1) Regions for AnJi subproject

AnJi region locates in the Tiaoxi River basin and it is known from the conventional water quality monitoring materials from 2012 to 2013 about the cross section of Tiaoxi River Chaitanbu, the monitoring section of Dipu and Zhili of West Tiaoxi River, the cross section of Jingwan, the cross section of Baishuiwan, the cross section of Liangpeng, the cross section of Wufengshan Mountain, the cross section of Banshanchang and the cross section of Liujiaqiao, all months are able to satisfy the required standards except for the Dipu cross section, with the ammonia nitrogen and the total phosphorus indexes exceeding the Class III standards in Environmental Quality Standards for Surface Water (GB3838-2002); water qualities of other cross section can meet the Class III standards.

All monitoring indexes of Fushi Reservoir satisfy the Class II water quality standard, including dissolved oxygen, permanganate index, BOD_5 ammonia nitrogen, total phosphorus, total nitrogen, copper, zinc, fluoride, selenium, arsenic, mercury, cadmium, hexavalent chromium, lead, cyanide, volatile phenol, petroleum, anionic surfactant, sulfate, chloride, nitrate nitrogen, iron and manganese, and it is satisfactory for the project limit value requirements to be regarded as domestic drinking water.

All monitoring indexes of Tianzigang Reservoir satisfy the Class II and III water quality standards, including total hardness (calculated by CaCO3), chloride, sulfate, total dissolved solids, nitrate, nitrite, ammonia nitrogen, total phosphorus, total nitrogen, volatile phenol, anionic surfactant, chemical oxygen demand (cod), fluoride, arsenic, iron, manganese, copper, zinc, cadmium, lead, chrome, mercury, total number of bacteria and total coliform group, and it is satisfactory for the project limit value requirements to be regarded as domestic drinking water.

(2) Region for Fuyang subproject

The Fuyang subproject is adjacent to rivers including the Fuchun River, the Gexi River, the Songxi River, the Luzhu River, the Dayuan River and the Nanxinxi River and according to monitoring results, the COD and ammonia nitrogen in the Gexi River nearby the project have exceeded standards, which means that it can not satisfy the functional requirements for the present Class II water body; while, TN, NH3-N, BOD5 and COD_{Mn} in Songxi River and Luzhu River are out of limits, primarily resulting from direct emission of domestic sewage into surface waters; current water quality of cross sections from Fuyang Bridge to Ling Bridge along the Fuchun River can no longer satisfy target requirements for the Class III water quality, with major factors out of gauge including fecal coliform, permanganate index, total phosphorus and petroleum pollutants, which are mainly affected from the pollutants discharged along the rivers. COD, DO, TN, NH3-N, T and petroleum in Dayuanxi River cause relatively serious pollution of current water quality of surface waters in the region

Generally speaking, rivers where the project locates are affected from the pollutants discharged along the rivers, water quality exceeds the standards at different levels, which can no longer satisfy the requirements on water functional areas, and the water quality is poor.

(3) Region for Tiantai subproject

According to analysis of surface water monitoring in Tiantai County in 2012, it is obvious that overall water quality of Tiantai County expresses certain decreasing trends and partial sections are seriously polluted, especially quality of the lower reaches of the Shifeng River, which is out of limits. Pollution characteristic of the water body is organic and major pollution factors include TP, ammonia nitrogen, permanganate index and BOD, etc. There are 9 monitoring sections totally in Tiantai County, seven of which satisfying the Class II water quality standards, accounting for 77.8%, the other two that meeting the Class III standards, occupying 22.2%. Average rate of reaching the standards is 100% according to data from conventional monitoring stations for surface waters in Tiantai County in 2012

(4) Region for Longquan subproject

The Longquan subproject locates at a region flowing by the Longquan River, the Anren River, the Badu River, the Yanzhang River, the Zhulong River and the Xiaomei River. Its all monitoring indexes can reach the Class III and II water quality *standards in Environmental Quality Standards for Surface Water* (GB3838-2002); therefore its water environment quality is better.

2. Present atmospheric environment quality condition

Daily average concentration of SO_2, NO_2 and PM_{10} are all lower than the Class II standard limit value in *Ambient Air Quality Standardss* (GB3095-2012) and ambient air quality in the project site is better.

As for the place where Fuyang subproject locates, concentration of both ammonia and hydrogen sulfide can reach the maximum acceptable concentration of hazardous substance in the air in the settlements according to the Hygienic Standards for the Design of Industrial Enterprises (TJ36-79), while that for PM10, SO_2 and NO_2 can meet the Class II standards in Ambient Air Quality Standards (GB3095-2012), so ambient air quality in the region is better.

As for the Tiantai region, concentration of SO_2, NO_2 and PM10 can all satisfy the Class II standard limit value in Ambient Air Quality Standards (GB3095-2012) and the regional ambient air quality is good.

As for Lonquan, Daily average concentration of SO_2, NO_2 and PM10 are all lower than the Class II standard limit value in *Ambient Air Quality Standards* (GB3095-1996) and the atmospheric environment quality in the project site is better.

3. Present of noise environment quality condition

Quality of acoustic environment of the place where the AnJi subproject locates is relatively perfect and can reaches relevant standard limit value requirements of *Environmental Quality Standards for Noise* (GB3096-2008).

As for the proposed places for the Fuyang subproject, expect that the east and the west boundaries of the Longyang Sewage Disposal Plant can not satisfy the Class 1 standard as required in *Environmental Quality Standards for Noise* (GB3096-2008) at daytime and that the south, the west and the north boundaries can not meet the Class 1 standards at night, noise level round the clock of other proposed

sites for the subproject can all satisfy the Class 2 and 4a standards in *Environmental Quality Standards for Noise* (GB3096-2008), so the quality of acoustic environment in this region is better.

Quality of acoustic environment of the place where the AnJi subproject locates is relatively perfect and can reaches relevant standard limit value requirements of *Environmental Quality Standards for Noise* (GB3096-2008).

Day and night Noise level of all proposed places for the subproject in Longquan region can satisfy the Class 2, 1 and 4a standards in *Environmental Quality Standards for Noise* (GB3096-2008) and the region has a relatively good quality of acoustic environment.

4. Present groundwater environment quality conditions

In the region for the Fuyang subproject, except that fecal coliform in underground water nearby the Xindeng Sewage Disposal Plant exceeds the Class III *standards in Quality Standards for Ground Water* (GB/T 14848-93), other indexes reach standards; each and every monitoring index at the gauging point for underground water of other regions is able to meet the Class III *standards in Quality Standards for Ground Water* (GB/T 14848-93). As a whole, the quality of the regional groundwater environment is relatively good.

In the Tiantai subproject region, fecal coliform in underground water exceeds the Class III *standards in Quality Standards for Ground Water* (GB/T 14848-93), while other indexes reach standards, which is mainly resulting from the penetration of domestic sewage into underground waters.

All indexes about underground water in the region where Lonquan Nandayang Water Plant locates can accord with the Class III *standards in Quality Standards for Ground Water* (GB/T 14848-1993), and the groundwater environment quality is relatively good.

2.3.2 Conclusion of main environmental impacts

1. Brief summary of impact on the ambient air

NH3 and H2S are the key pollutants discharged by Meixi Sewage Disposal Plant, AnJi Urban Sewage Disposal Plant, the fourth phase of Fuyang Sewage Disposal Plant, Fuyang Longyang Sewage Disposal Plant, Sewage Disposal Plant of Anren County of Longquan City, Sewage Disposal Plant of Badu County of Longquan City, Sewage Disposal Plant of Chatian County of Longquan City, Sewage Disposal Plant of Lanju Town of Longquan City, Sewage Disposal Plant of Xiaomei County of Longquan City and Tiantai Cangshan Sewage Disposal Plant. According to calculation and prediction, the Maximum Ground Concentration of NH_3 and H_2S upon superposition with the background value conforms to the maximum allowable concentration of hazardous substances in ambient air of the residential areas as required in Hygienic Standards for the Design of Industrial Enterprises (TJ36-79). Momentary maximum allowable concentration of NH_3 and H_2S of sensitive spots nearby plant site can also reach standards and the ambient environment is influenced on a relatively low level.

Decentralized sewage disposal stations in rural areas has lower sewage disposal capacity and hardly discharge NH_3, H_2S and other odor pollutants, having small impact on the atmospheric environment.

2. Brief summary of impact on surface water environment

(1) Phase IV of Fuyang Sewage Disposal Plant Project

① At the time of normal discharging, the envelop area is 0.053km² if the maximum incremental value of COD_{Mn} during neap tide is larger than 2mg/L and its contribution value to boundaries of the functional district of the downstream Class II surface water is 0.24mg/L; when the discharge is abnormal, the envelop area is 0.082km² if the maximum incremental value of COD_{Mn} during neap tide is larger than 2mg/L and its contribution value to boundaries of the functional district of the downstream Class II surface water is 0.29mg/L; during accident discharge, the envelop area is 0.167km² if the maximum incremental value of COD_{Mn} during neap tide is larger than 10mg/L and its contribution value to boundaries of the functional district of the downstream Class II surface water is 1.84mg/L. while individual discharge, certain influence will produce to the water environment of the involved waters; normal discharge impacts the water environment at slightest, and abnormal discharge greater, accident discharge greatest. NH_3-N and TP have similar disciplines.

② It is indicated by overlaying with numerical procedures of other pollution sources, other sources of pollution have little influences on the water environment of waters nearby the discharge outlets for the fourth phase of Fuyang project, whose sewages will not overlaid with other polluters and whose contribution value to boundaries of the Class II surface water at the upper reaches takes little proportion.

③ Upon the execution of the fourth phase of Fuyang project, emission loads of NH_3-N and NH3-N respectively increased by 46% and 9%, which is with a trend consistent with the predictive results about the water quality affected in the water body and the NH_3-N index and the NH_3-N expressed certain variation in the receiving waters.

④ What are connected with the discharge outlets of Fuyang sewage disposal plant is completely drinking water source protection areas. Several water intakes have been set at the upper and the lower reaches. At the time of normal discharging, since the sail upstream river function of this river section is weak, water quality is barely influenced at intakes from Fuyang Jiangbei and Jiangnan water plants at the upper reaches of sewage discharging of the fourth phase of Fuyang project. At the lower reaches, Zhoupu Water Plant is the nearest water plant away from the discharge outlet, and the plant, during spring tide, will have the maximum incremental value about COD_{Mn}, NH_3-N and TP respectively being 0.15mg/L, 0.04mg/L and 0.004mg/L, while that in the neap tide period is separately 0.12mg/L, 0.03mg/L and 0.003mg/L. Water intake from the Juxi Water Plant is the largest water intake for domestic water in Hangzhou, which, during the spring tide, has the maximum incremental value about COD_{Mn}, NH_3-N and TP respectively being 0.04mg/L, 0.01mg/L and 0.001mg/L, while that in the neap tide period is separately 0.03mg/L, 0.01mg/L and0.001mg/L; therefore, the impact is relatively small.

(2) Other sewage disposal plants

Other sewage disposal plants do not have water intakes or other protected object nearby the discharge outlets. Based on predicted results, when each sewage disposal plant conducting up-to-standard discharge, some may exceed the standards nearby the discharge outlets; but after mixing and attenuation along certain distances, it is able to satisfy the functional requirements of water body absorbing pollutants, making relatively small impact on water quality in the lower reaches. Since sewage inside the service scope of the project are collected and processed, replacing the former direct discharge

situations, pollutants discharged into the river are reduced and water quality will be improved.

(3) Water plant

Water quality of water sources of AnJi Gaoyu Water Plant, Banshan Water Plant and Nandayang Water Plant involve in the project are stable and up to standards, which can meet water in-taking of all water plants. Therefore, the project water in-taking impact on water usage of lower reaches of the river is relatively small.

4. Decentralized rural disposal system

Decentralized rural sewage disposal stations are scattered in four counties with lower sewage disposal capacity; besides, certain sewage will be filtered by the soil infiltration system and therefore, the impact of tail water discharged into the surface water body is not obviously.

3. Brief summary of environmental impacts from noise

(1)Sewage disposal plant

Noise coming from sewage disposal plants are mainly mechanical noises produced by air blowers in the blower room, various pumps in the sewage pump house, dehydrators, solids and liquid separators, grit-water splitters, air compressors and other equipment, whose noise intensity are about 75 - 95dB.

Based on prediction and analysis, except for the east and north boundaries of Meixi Sewage Disposal Plant which exceed standards at night, noise level of each boundary could all live up to the Class 2 standard value (60dB) as required in Emission *Standards for Industrial Enterprise Noise at Boundary* (GB12348-2008); while noise level of each boundary of the AnJi Urban Sewage Disposal Plant can reach the Class 2 standards.

As for the forth phase of Fuyang Sewage Disposal Plant, its south boundary will reach the Class 4 standards day and night; while its east, west and north boundaries are able to reach the standards in the daytime; but the east and the north boundaries at night are respectively 1.1 and 0.1 higher than the standard value. The west boundary does not exceed standards at night.

Noise levels at each boundary of the Sewage Disposal Plant of Anren County, the Sewage Disposal Plant of Badu County, the Sewage Disposal Plant of Chatian County, the Sewage Disposal Plant of Lanju Village and the Sewage Disposal Plant of Xiaomei County in Longquan City are all up to standards.

As for Longyang Sewage Disposal Plant, except for the south boundary with a noise level exceeding 7.4dB at night and the north boundary, with a noise level exceeding 0.4dB at night, noise levels of other boundaries can all reach the Class1 standards.

Noise levels of each boundary Tiantai Cangshan Sewage Disposal Plant can satisfy the Class 1 standard requirements at day and night.

All sensitive spots nearby the sewage disposal plants could reach the standards and little impacted by noise.

(2) Water plant

Noises generated during the production of tap water are mainly divided into pneumatic noise and mechanical noise coming from air blowers and water pumps used by water plants. Upon prediction,

noise values at the boundaries of each water plant can conform to the Class 2 standard values in Emission *Standards for Industrial Enterprise Noise at Boundary* (GB12348-2008).

4. Brief summary of environmental impacts from solid wastes

Solid wastes produced by the project mainly consist of sludge from sewage disposal plants and water plants and living garbage from the staves.

Domestic garbage will be collected and cleaned by local environmental sanitation department.

Sludge produced from the forth phase of Fuyang Sewage Disposal Plant and by the Longyang Sewage Disposal Plant will be delivered to Zhejiang Qingyuan Ecological Thermoelectric Co., Ltd to be burned for disposal; sludge produced from Meixi Sewage disposal Plant and AnJi Urban Sewage Disposal Plant will be dumped in refuse landfills; sludge produced from Tiantai Cangshan Sewage Disposal Plant will be filled in the refuse landfill in Tiantai County; sludge produced from Longquan Nandayang Water Plant will transport to Gaotang Rufuse Landfill for sanitary landfill, and sludge produced by the sewage treatment subprojects shall undergo composing process, with the composts to be used by nearby farmlands or hills near the project. In general, sludge produced by the project has no adverse affects on ambient environment upon effective treatment.

3. Organization arrangement

3.1 Environmental management organization and its responsibilities

In line with the authorities of management and supervision specified respectively in *Environmental Protection Law of the People's Republic of China and Regulations* on *the Administration of Construction Project Environmental Protection* (No. 253 order by the State Council), the execution units during constructing of each subproject are the relevant subproject offices and the construction units in corresponding counties, and at the operation phase, related subproject will be handed over to the operation and maintenance unit for business management.

Since environmental management contents in construction period are quite different from that of operation period, additionally, they are different in working time limit by temporality and chronicity, therefore, independent environmental management organization shall be set up, with corresponding responsible systems performing at relevant stages. Upon the completion of the construction, relevant management organization will be immediately canceled, while the management organization of operation period will be set up. Based on specific situations, these organizations may exist simultaneously for certain period. Relevant organizations for environmental protection of this project may be divided into the management and the supervisory organization. Please refer to the following Figure 3-1 for environmental management organization setup of construction period, and Figure 3-2 for environmental management organization setup of operation period.

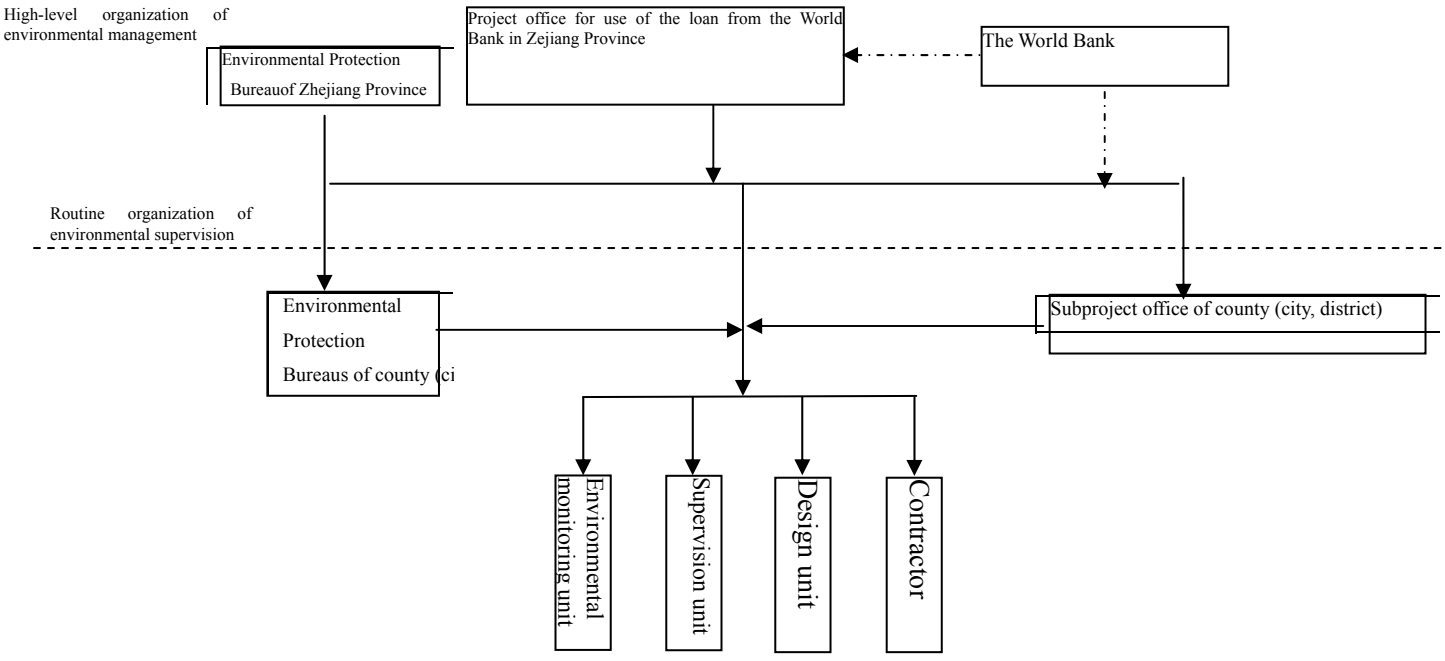

Figure 3-1 Set-up Diagram of Environmental Management Organization Setup of Construction Period

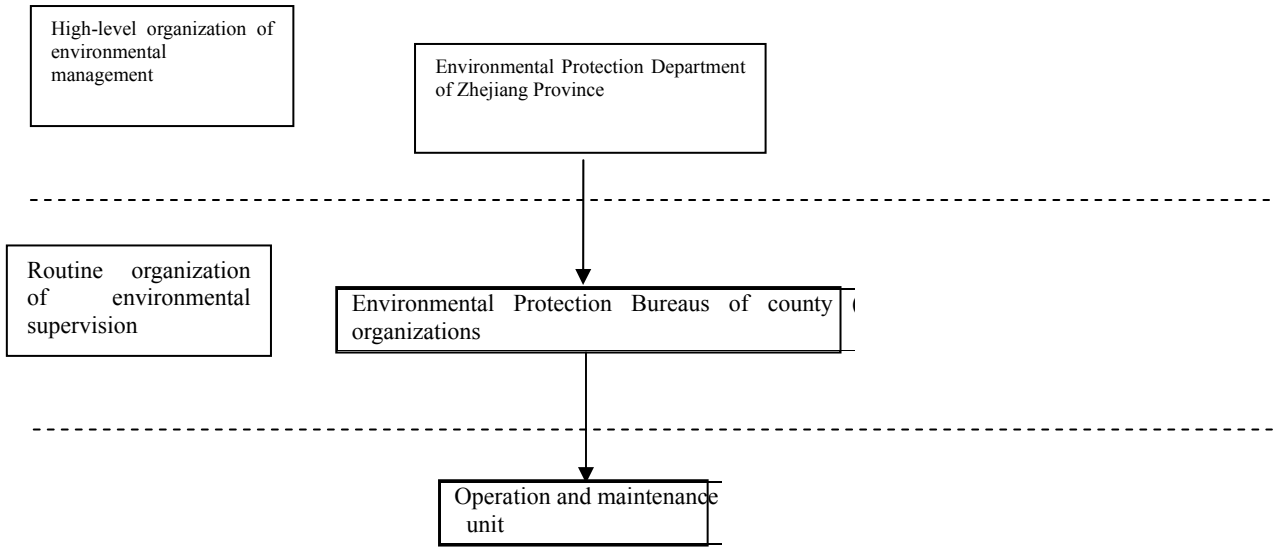

Figure 3-1 Set-up Diagram of Organization of Environmental Management in Construction Stage

3.1.1 Management organization

Organization of environmental management consists of Project Office of Zhejiang Province, subproject offices of the four counties and cities, construction units as well as operation and maintenance units.

Specific responsibilities of them: Project Office of Zhejiang Province takes total charge of managing the project's environmental protection works, organizing feasibility study of project construction, formulating environmental protection work plans, coordinating environmental management works between each competent departments and construction units, and directing construction units to perform each management measure; environmental protection administrations under the four subproject offices are for environmental management in the plan and design stages of environmental protection; construction units will take charge of the execution and management of environmental actions in the construction and the operation period; operation and maintenance units for each subproject hold liabilities for execution and management of environmental protection measures during the operation and maintenance period, whose special responsibilities include implementing environmental protection laws, regulations and standards; purchasing environmental protection facilities, cooperating the completion and acceptance of the project, leading and organizing each environmental supervision of the project, checking operation statuses of all environmental protection facilities, providing technical trainings for relevant specialists and improving overall qualities and levels of the whole staff.

3.1.2 Supervisory organization

Environmental impact statement for each subproject shall be approved respectively by Zhejiang Environmental Protection Bureau, AnJi Environmental Protection Bureau, Longquan Environmental Protection Bureau, Fuyang Environmental Protection Bureau and Tiantai Environmental Protection Bureau. Environmental protection administrations responsible for the approval of each subproject are the highest supervisory organization of environmental management.

Supervisory organizations for environmental protection are composed of Zhejiang Environmental

Protection Bureau, AnJi Environmental Protection Bureau, Longquan Environmental Protection Bureau, Fuyang Environmental Protection Bureau and Tiantai Environmental Protection Bureau.

Execution of supervision organizations in phase:

1. The feasibility study stage: in the charge of World Bank, Zhejiang Environmental Protection Bureau and environmental protection bureaus of the four counties and cities;

Zhejiang Environmental Protection Bureau and environmental protection bureaus of the four counties and cities will take graded responsibilities of supervision and management of environmental protection works of the project, organizing and coordinating relevant institutions to provide services for such works, supervising the implementation of the project's environmental protection plans and completion acceptance of relevant environmental protection facilities.

(2) The design stage: in the charge of the provincial project office and environmental protection administrations under the four subproject offices;

(3) The construction stage: in the charge of the provincial project office, environmental protection administrations under the four subproject offices, Zhejiang Environmental Protection Bureau and environmental protection agencies in four counties; Environmental protection agencies in four counties will accept directions from the Zhejiang Environmental Protection Bureau, supervise the construction unit to perform environmental action program, carry out related environmental management laws and regulations, coordinate environmental protection works between each unit and take charge of inspection, supervision and management of construction, completion acceptance, operation of environmental protection facilities for the project.

(4) The operation stage: in the charge of Zhejiang Environmental Protection Bureau and environmental protection agencies of the four counties Operation and maintenance units of each subproject are responsible for performing environmental protection laws and regulations, formulating related regulatory framework and supervise their execution, understanding environmental conditions of the project, making out control objectives about environmental qualities for the convenience of assessment, putting forward treatment measures and submitting them to superior departments of environmental protection and competent authorities of the industry, organizing evaluation and training of environmental protection personnel who shall operate with certificates and developing communication and scientific researches about environmental protection technologies.

(5) Environmental monitoring during construction and operation periods Local environmental monitoring stations or qualified monitoring agencies can be entrusted to conduct environmental monitoring during construction period. Environmental monitoring in the operation period shall be performed based on supervision abilities of the subproject itself and it is allowed to be finished by monitoring institutions of its own or by entrusted local environmental monitoring agencies.

During construction, the provincial project office and subproject offices of the four counties shall be prepared with environmental supervision engineer, to take charge of environmental supervision of regions where the project locates and manage and inspect the implementation of environmental

protection measures under EMP and in the plan of bidding documents.

3.2 Composition of environment action plan

1. Environmental management plan: management activities to prevent or lessen adverse environmental effects.

2. Environmental supervision plan: supervisory activities to ensure the synchronous implementation of the project and all mitigation measures.

3. Environmental monitoring plan: monitoring actions to eliminate pollutions in construction operation period.

3.3 Implementation of Organizations

1. Organization establishment

At the initial stage of each subproject, it is necessary to prepare relevant organizations of environmental management and which will begin to work after the commencement of the project. In the construction period, relations with Zhejiang Environmental Protection Bureau and local environmental protection administrations shall be reinforced, to strengthen environmental management in the construction and operation period.

2. Implementation of funds

Organizations of environmental management require a large sum of funds to be used for the implementation of each environmental management and supervision plan; besides, huge investment shall be made each year to purchase necessary environmental facilities and function as running costs; in investment estimate, it needs to reserve sufficient funds as a fixed sum is for a fixed purpose.

3. Personnel training

All personnel under organizations of environmental management shall receive technical trainings, while as for managers, education and trainings with regard to policies, regulations and business shall be strengthened to improve their management and business level.

4. Reinforcement of management

Leaders of construction units for each subproject shall strengthen control on organizations of environmental management for each subproject. In addition, sufficient cares and supports shall be completely expressed in terms of policies, funds and talents; and upon the completion of this project, organizations of environmental management shall be entirely finished; besides, it needs to ensure the normal operation of environmental management and supervision works at the trial operation phase.

4. Environmental Regulations ECOPs

4.1 Environmental Protection Regulations at Design Phase

Refer to Table 4-1 for detailed environmental protection regulations at design phase.

4.2. Environmental Protection Regulations at Construction Phase

Refer to Table 4-2 for detailed environmental protection regulations at construction phase.

4.3 Environmental Protection Regulations at the Operation Phase

Refer to Table 4-3 for detailed environmental protection regulations at operation phase.

4.4 Environmental Protection Regulations for Sewage Disposal Projects in Decentralized Rural Areas

Refer to Table 4-4 for detailed environmental protection regulations for sewage disposal projects at decentralized rural areas.

4.5 Fuyang Sewage Phase IV Project Environmental Protection Regulations

See Table 4-5 for more details about Environmental Protection Regulations of Fuyang Sewage Phase IV Project.

Table 4-1: Environmental Protection Regulations at the Design Phase

Environmental factors	Environmental protection measure	Execution unit	Supervision unit
Social environment	1. At the time of pipe laying and site selection for sewage disposal plants (stations), water plants and pumping stations, the natural and social environment alongside be thoroughly considered to save farmlands as much as possible, to pass round population centers, schools, hospitals and other environmental sensitive areas and to lessen the interruption and demolishing of alongside electricity, telecommunication and water conservancy facilities. Pipelines shall stay away from natural reservation areas, cultural relics and historic sites, water sources and key national engineering facilities. 2. Reasonably set up structures and lessen the inconvenience resulted from project construction suffered by residents alongside in terms of their living and production. 3. Satisfactorily perform construction organization design and minimize the environmental influence due to construction. 4. Site selection for roads, pipelines and sewage disposal facilities shall try best not to demolish or impact lives of villagers in the neighboring. 5. Sufficiently take into account potential inconvenience resulting from project performance to the living and production of local residents. For example, set up pedestrian paths at sections with relatively populated residents, for the convenience of their transportation; all canal systems and other foundation facilities damaged during project construction will be repaired in the process, to ensure the completeness of such facilities. 6. Optimize construction design, shorten time limit for the project, try best to reduce large scale excavation and refilling, reasonably arrange the construction schedule and reduce the effects of project construction on local production. 7. When modification plans are designed for indoor pipelines, it needs to ask relevant villagers for advices and suggestions and to try best to decrease the damages on residential walls and indoor decoration through optimized designs. 8. At the time of comparing and selecting project design schemes, it is necessary to sufficiently consider the operation and maintenance fees. The design scheme costing less operation and maintenance fees should be selected under conditions where selection factors are similar or have little difference. 9. Try best to avoid or lessen occupying current residential areas or those under planning, avoid or lessen occupying qualified farmlands and apply present national or location roads to arrive at the proposed construction region.	Design unit Construction Unit	Provincial Project Office and Subproject Office of these four counties
Water Environment	1. On the basis of sewage properties, the design unit shall optimize sewage disposal technologies, structure parameters and plane layout to reserve certain amount of design allowance, load elasticity and expansion space and ensure that sewages discharged by the project are stable and can satisfy relevant standards. 2. Optimize design of discharge outlets, reasonably set up location of discharge outlets and emission means and		

Environmental factors	Environmental protection measure	Execution unit	Supervision unit
	fasten the diffusion and attenuation of waste water in water bodies for pollutants absorption. 3. From the perspective of clean production and water resource conservation, under practicable conditions, perform advanced treatment appropriately and reuse of reclaimed water and lessen the effects on the water environment at the same time of water resource saving. 4. In villages with mature conditions, build open channels for rainwater along houses, establish concave green belts and grass slopes, erect parking lots with permeable surface and clean up and renovate outworn ponds and ditches, with the purpose to lessen non-point source pollution and the influence of domestic sewage disposal on surface water.		
Ecological Environment	1. At the time of site selection for sewage disposal plants, water plants and pumping stations, it needs to set up the scope of the site based on project scale, without blindly occupying lands, control the project's construction boundaries and lessen damages on neighboring farmlands. 2. Seriously control the volume of earth works and ensure the equal of cut and fill. 3. At the time of pipe network project, it needs to strictly control the excavation scope, and not to involuntarily increase excavation areas, so as to decrease soil loss amount.		
Acoustic Environment	1. Locations of sewage disposal plants, water plants and pumping stations shall try best to stay away from villages, schools, hospitals and other sensitive spots, with a suitable protective distance to lower the effects on residents from noises bad smells. 2. Select equipment with excellent performance and lower noise to lessen the effects from noises.		
Atmospheric Environment	1. Locations of sewage disposal plants and sewage pumping stations shall try best to stay away from villages, schools, hospitals and other sensitive spots, with a suitable protective distance to lower the effects from bad smells. 2. Select economical and reasonable deodorization processes and reduce exhaust emission.		

Table 4-2 Environmental Protection Regulations at Construction Phase

Type	Environmental protection measure	Execution unit	Supervision unit
Invitation and submission of tender	1. The bidding documents shall specify the environmental protection objectives to be realized in each project section, and state the responsibilities and liabilities of each constructor to such goals within the project region. Each environmental protection measure and suggestion put forward in the environmental impact statement approved by environmental protection administration shall be stated in contract terms. 2. In bidding documents shall include the responsibilities of the constructors to environmental protection and constructors for each subproject shall promise to hold his environmental protection liabilities related with the environmental protection goals within the project scope; the construction organization design and plan made shall contain details about the performance and execution of environmental protection measures.	contractors Construction Unit	Provincial project office and subproject offices of the four counties
Requirements on Constructors	1. Constructors selected shall be competent, with the view to ensure the effective implementation of the environmental management plans; 2. Contractors and construction supervisors are requested to accept trainings about relevant environmental protection and management prior to construction; 3. Mitigation measures for environment impact during construction shall be included in bidding documents, as well as the manufacturing agreement at last, as contract requirements on constructors about the project; 4. Each constructor is required to monitor its environmental actions and provide logs about environmental performance weekly. Each project office, construction unit and supervision group shall supervise and inspect these records. 5. Each contractor shall assign one full-time worker for environmental protection related with the project. These workers for environmental protection shall have received professional trainings to be competent for their works. 6. During construction, the contractors shall communicate and coordinate with residents within the region of the project and set up bulletin boards at each construction section, to notify the public about specific construction activities and construction time. At the same time, it need to provide contract persons and phone numbers for the convenience of the public to make complaints and give advices about the construction.	contractors Construction Unit	Provincial project office and subproject offices of the four counties
General Provisions	1. Owner units of the construction shall specially assign persons to take charge of environmental protection problems occurred during the construction and the operation period, deal with environmental disputes between the contractors and the environmental protection objects, supervise the implementation of each environmental protection measure during construction and request each constructor to designate at least one principal administrative leader to be responsible for works in the respect, so as to coordinate with the owner to jointly execute each environmental protection measure. 2. Contractors shall optimize the construction scheme, try best to use the latest and most advanced construction technologies with scientific management and improve the construction schedule under the premise of ensure project quality. Besides, strengthen the management and maintenance of construction facilities and completely	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection

Type		Environmental protection measure	Execution unit	Supervision unit
		eradicate the leakage of petroleum materials and other building materials delivered. Reduce the possibility of surface water pollution in the project region. 3. The owner shall be responsible for compiling and printing materials to publicize information about environmental protection and provide education to the whole staff in this respect, so as to improve the environmental protection awareness of the workers. 4. During construction period, it is seriously forbidden to randomly pile mucks from excavations or dump them to nearby rivers and nor is it allowed to discharge domestic garbage of the workers to nearby rivers. 5. During construction, advanced equipment shall be preferentially applied to lessen the interruption to normal lives and resting of neighboring residents resulting from construction noise.Construction equipment with strong noise should be broken off during 22:00 at night to 06:00 next day to ensure normal rest of residents at night. In addition to taking necessary controlling measures to remit troubles, contractors shall also post notifications at each entrance and residential area. Ask passengers or residents for understanding and support, so as to comfort persons affected due to project construction and give supports in action to reduce the incompatibility resulting from construction for the convenience of the project's smooth performance. 6. The construction site shall be timely watered for dust fall based on the weather situations and as for building materials throwing out on nearby roads, contractors of each section shall designate specially assigned persons to timely clean them up, to decrease pollution to ambient air quality due to raise dust.		administrations
Prepare environmental protection rules for construction sites		1. It is not allowed to set up temporary sites inside natural protection areas, water source protection areas and rivers and canals reservation zones. 2. Temporary sites shall not be situated within 100m away from rivers generally. 3. Temporary sites shall locate at wasteland with sparse vegetation or open spaces in villages. 4. It needs to strictly control the number of land used, try best to occupy fewer farmland and set up temporary sites for the project inside the scope of permanent site, so as to lessen the amount of land temporarily required. 5. Construction site and concrete mixing station shall keep away from residential areas as far as possible, 300m at least and locate at the downwind direction of perennial leading wind of environmental sensitive sites. 6. Prior to entering into the construction site, it needs to arrive on site in advance for investigation, so as to reasonably arrange the location for construction based on practical environment conditions.	Contractors	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations
pollution control regulation	Management of land acquisition and demolition	1. A detailed immigration plan shall be formulated, where it needs to specially show considerations for female headship of household, household enjoying the minimum living allowance, households enjoying the five guarantees and other disadvantaged groups and guide them to use resettlement compensation for revenue recovery. 2. In requisitioning collectively-owned land, compensation should be made according to the original purposes of the land requisitioned. Compensation fees for land acquisition consist of land compensation fees, resettlement fees and compensations for ground attachments and young corps. Compensation for land acquisition shall be performed based on the type of land acquired in line with comprehensive compensation	Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental

Type		Environmental protection measure	Execution unit	Supervision unit
		standards (i.e. land compensation fees and resettlement fees) of the counties and cities where the project locates. Ground attachments and young crops are compensated according to practical valuation. 3. Resettlement of inhabitant is mainly performed by currency, old-age security, job and other means. 4. Land requisition compensations (including land compensation and resettlement subsidies) shall be entirely paid to the affected households, who, upon the receiving of such funds, will decide to participate in lost-land peasants' social security or other securities (such as rural social endowment insurance) based on personal willing. Compensations for ground attachments and young crop compensation fee shall be held by relevant property owners. 5. The government establishes a complete labor service system to offer assistance for affected villagers and provide immigrants with helps through various channels. Such as open the talent market for free and provide professional and technical trainings. 6. Compensation for land acquisition shall be executed according to relevant policies made by governments at all levels. 7. It requires that, in line with national land management law, ordinances about compensation and resettlement, as well as other laws, regulations and policies, suitable implementation plans about land requisition and demolishing and compensation and resettlement shall be formulated for comprehensive arrangement, complete coordination, sufficient compensation, appropriate layout without any future troubles and various compensations shall be fully allocated to relocation households or units, instead of being withheld or embezzled by units concerned, so as to ensure the affected people to live and work in peace and contentment and the influenced enterprises having a stable production and to ensure that living standards of immigrants are no lower than their original ones. 8. The construction unit shall formulate reasonable plans about land acquisition, demolishing and resettlement, as well as the implementation schedule and hand over land requisition and demolition funds as required by relevant policies and standards. 9. Compensation fee shall be a fixed sum for such fixed purpose and timely distributed to relevant villages and individuals as required. At the same time, it requires to apply effective publicity means and conduct vigorous propaganda about relevant national compensation for land acquisition and resettlement compensation.		protection administrations
	Management measures about impacts on farmlands and water conservation alongside	1. Parallel operation should be conducted during earth borrowing for construction, which means excavate at the same time of leveling and protection. 2. To ensure the smoothness of farmland canals and to prevent water and soil loss, whenever a project involves in change works of farmland canals, it needs to try best to construct such works at non-irrigation period and to timely restore upon the completion, to ensure an unimpeded canals system during irrigation. 3. If original irrigated areas or water conservancy facilities are necessary to be demolished or changed, it needs to firstly build substituted irrigation ditches and to put them into service prior to the dismantling works.	Contractors	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental
	Management	1. As for all public facilities and structures affected or to be affected by the proposed project, the contractor		

Type		Environmental protection measure	Execution unit	Supervision unit
	measures about impacts on current transportation and other infrastructure	shall take all appropriate measures in the course of construction of proposed projects for protection. 2. With regard to existing roads, telecommunications, electricity, pipelines and other base installation within the scope of the project, it needs to coordinate related departments to satisfactorily fulfill demolition or transformation works in advance and to notify affected residents for suitable preparations ahead of time, so as to avoid numerous adverse influences. 3. At the construction stage, transportation of raw and auxiliary materials or large machinery may cause damage on the local roads and such roads shall be renovated during and upon construction or hand over compensation funds to local highway management departments for repair. 4. The construction unit shall sufficiently coordinate with local traffic and public security departments, reinforce transportation management and try best to lessen the interruption to existing transports due to pipeline laying. At the same time, the construction unit shall make out favorable shipping plan and the transportation of road materials shall avoid local traffic peak hours, so as not to cause traffic congestion and decrease road accidents. 5. The contractor shall notify departments concerned as for excavations nearby public facilities and invite representatives of such departments to arrive on site at the time of construction. Copies of above notifications and inventions shall be submitted by the contractor to the supervising engineer for future reference.		protection administrations
Protective and administrative regulations of cultural relics and historic sites		1. During construction, if cultural relics and historic sites are discovered or suspected to exist, the construction unit shall in line with Law of the People's Republic of China on the Protection of Cultural Relics (2007. 12. 29) and policies about physical cultural resources made by the World Bank, immediately preserve the scene and report to local Cultural Relics Bureau and the project may be continued only after the processing of the Bureau. 2. According to Article 11 of Chapter 2 in the *Law of the People's Republic of China on Protection of Cultural Relics*, no additional construction project may be undertaken within the scope of protection for a historical and cultural site. In case of a special need, consent must be obtained from the people's government which made the original announcement on the designation of such a site and from the department for cultural administration at the next higher level. If an additional construction project is to be undertaken within the scope of protection for a major historical and cultural site to be protected at the national level, consent must be obtained from the people's government of the relevant province, autonomous region, or municipality directly under the Central Government and from the state department for cultural administration. 3. Any removal or dismantling involving a site to be protected for its historical and cultural value, and if considered specially necessary for a project, shall be agreed to by the people's government at the same level as the site itself and by the department for cultural administration at the next higher level. Any removal or dismantling involving a major site to be protected at the national level shall be referred to the State Council by the people's government of a province, an autonomous region or a municipality directly under the Central Government for decision. The expenses and workforce required for the removal or dismantling shall be included in the investment and labor plans of the construction unit.	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations

Type	Environmental protection measure	Execution unit	Supervision unit
	4. The principle of keeping the cultural relics in their original state must be adhered to in the repairs and maintenance at the sites designated as the ones to be protected for their historical and cultural value and in any removal involving these sites, such as sites related to revolutionary history, memorial buildings, ancient tombs, ancient architectural structures, cave temples, stone carvings, etc. (including attachments to the structures). 5. During construction, if cultural relics and historic sites are discovered or suspected to exist, the construction unit shall: (1) Immediately suspend constructions at the site finding such relics and reinforce the preservation of the scene; (2) The contractor shall immediately report to polices and competent departments about cultural relics for authentication and treatment; (3) Once they are identified as cultural relics, the scope of protection shall be timely delimited; (4) It needs to rescue and explore these relics if the construction period is urgent or due to risks of natural damages exit; (5) Rescuing and exploration of relics shall be performed by specialists by dedicated equipment, rather than arbitrarily done by the contractor; (6) If it is confirmed as a major cultural relics discovery, decisions shall be made about whether it needs to change construction site of the project.		
Noise pollution control regulations	1. Reinforce environmental management on the construction site and strictly perform regulations in the Noise Limits for Construction Site. 2. Reasonably arrange the construction schedule, forbidden field operation with strong noise at night, suitably lay out and set up blanket materials around equipment yielding strong noise. Operation at night shall be approved by the environmental protection agency in advance and follow regulations. 3. As for main traffic routes, residential areas, sewage disposal plants, water plants, pumping stations and other plant sites, where pipeline laying passes by, notices shall be posted to give peace to residents alongside, with indicated construction deadline. The purpose is not only to comfort residents concerned and obtain understanding from the public but also to supervise the constructor at the same time, which is beneficial for the project to be completed on time. 4. With regard to schools and other sensitive spots, it requires that running of equipment yielding strong noise shall avoid the school time; as for residential areas, the noon break; as for hospitals and governmental office blocks, it needs to try best to shorten the operation duration of equipment with loud noise and to select low-noise machinery for construction equipment and methods, such as small machines. 5. Take use of the operation method of “collectively constructing section by section”, shorten construction duration and reduce the impacts of noise on local acoustic environment. 6. Sensitive spots alongside the route shall be prepared with prevention and control works against noise pollutions and it is allowed to erect guard rails 1.5 - 2m in height to shield construction noise.	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations

Type		Environmental protection measure	Execution unit	Supervision unit
		7. In order to ensure the health of the builders in line with the Sanitary Standards about Industrial Enterprise Noises, it is suggested that related units shall reasonably arrange the working time of the staff, ensure the staff to operate machinery producing strong noise and radiation in rotation and reduce the time to expose to strong noise. Operators and relevant personnel are recommended to take personal protective measures, such as wearing earplugs and helmets. 8. Try best to use construction machinery and technologies with low noise, install vibration bases for fixed machinery and equipment yielding relatively massive vibration and strengthen the maintenance and repair to various facilities. Intensify management to sources of noise pollution on the construction site and gently lift and put down mental materials at the time of their loading and unloading.		
Air pollution control regulations	Construction fugitive dust	1. Erect containment around the construction site (propose to use color plates for closed or semi-closed enclosure). Under conditions where the pipe network project undergoes consistent fine weathers with wind, it needs to water temporary storage locations for earth excavation or to cover such areas with green nerve of a covering, to prevent the occurrence of fugitive dust. 2. The construction unit shall timely dispose of spoils as planned and cover canvas on vehicles delivering such spoils during their shipping (the vehicles shall be enclosed during transport). As for transport routes with non-soil surface, watering is necessary; meanwhile, earth excavation and material loading and unloading shall be performed under windless conditions. Shipping vehicles shall not overload and measures shall be taken to ensure that carrier vehicles for relict soils will not leak. Earth on tires shall be cleaned off by besoms in advance of their departure, to prevent relict soils scattering alongside and affecting the cleanness of environment. At the same time, real time cleaning shall be performed to roads on the construction site, to timely eliminate spoils produced. 3. Specially assigned persons shall be responsible for the construction site, to realize scientific management and civilized construction; during the basic construction period, it needs to try best to take measures to improve the project schedule and to deliver earthwork timely to designated places, shortening the damage cycle of piling. 4. During excavation and demolishing, watering can maintain the humidity of the operations: spray water regularly to the inattentive and dry surface soil to prevent dust producing; at the time earthwork backfilling, water appropriately when the surface soil is dry, to avoid dust explosion. 5. Trucks and carrier vehicles for earthworks and building materials shall be equipped with spilling-proofing equipment as specified and they shall not be unsuitably overfilled, to ensure no fallout will occur during delivery; also, running courses and time of these vehicles shall be favorably projected, trying best not to run in prosperous areas, traffic concentration area, residential areas and other sensitive spots; with respect to road segments with high environmental requirements, it needs to transport at night based on practical situations, to lessen the effects of raise dust on the environment. 6. Add canopy for carrier vehicles, wash out the loading and unloading site prior to shipment and cut down	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations

Type		Environmental protection measure	Execution unit	Supervision unit
		dirts carried by tires and underpans to scatter on the ground. 7. Dirts scattered on the ground during delivery shall be cleaned out, to lower the production of raise dust during operation. 8. Sands, cements and other materials that are easily yielding raise dust piled in the open air shall be covered with overcanopy and plastic cloth, to prevent the diffusion of raise dust. 9. During construction, it is strictly forbidden to burn discharged building materials as fuels. 10. Rails around the site for demolishing project shall be complete. 11. Upon construction completion, it needs to timely renovate the surface roads and vegetations on lands occupied for construction. 12. Try best to avoid construction on windy weathers and try best to shorten the construction duration, improve the project efficiency and lower the duration when the surface is exposed. 13. On the construction site shall have specially assigned persons to regularly water the ground, so as to reduce the amount of raise dust, with the number for watering decided based on practical weather conditions, but generally 1-2 timers per day. Should it is windy or dry, it is allowed to suitably add the times of watering.		
	Preventive measures against construction machinery and vehicle exhaust pollution	Construction machinery and carrier vehicles to be used shall abide by national public health standards, and their exhaust emission shall comply with relevant national standards. At the same time. Such measures taken against construction machinery and vehicle exhaust as overload restriction, speed retaining and installation of exhaust purifier may decrease the influences of exhaust produced by carrier vehicles and construction machinery to surrounding residents.		
impact on water environment pollution control regulations		1. Domestic sewage produced by construction staff shall be used for farmland irrigation or mountain forest greening when such materials satisfy certain standards upon processing, rather than randomly discharging, It is suggested to borrow existing living facilities from local villagers. Construction sites with mature conditions shall install sewage interruption pipelines. 2. Muddy water from the site shall firstly be collected into settling ponds for sedimentation, to discharge the supernatant liquor, while mud left may be delivered externally for landfill upon desiccation; or may be used as filler of the project in association with practical road greening. 3. Storm sewage and muddy water shall be collected for sedimentation before their discharging satisfying specified standards. Reinforce maintenance and repair of construction machinery, which shall be inspected prior to construction, to avoid accidents occurrence as oil leakage in the process of operation. 4. If construction sites of the project involve in protection zones of drinking water source, it is strictly forbidden to discharge construction wastewater into such area, rather, they shall be collected, processed and cleared. 5. Wastewater due to pigging and pressure testing shall be sedimented and filtered before discharging into	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations

Type		Environmental protection measure	Execution unit	Supervision unit
		nearby ditches. 6. Should pipelines be necessary to cross rivers, it needs to try best to perform in non-flood season. Approval shall be obtained from departments concerned, and local watercourse management rules shall be seriously complied with. 7. Piling and storage of construction materials such as cements, oil paints and chemicals shall be strictly controlled and tarpaulin shall be covered during the process. It is not allowed to pile them up nearby rivers. When necessary, rails shall be erected, to prevent rainwater flushing these materials into the rivers at rainy season or at the time of intense fall to cause pollution. 8、It is forbidden to pour waste residues into rivers which is produced by river crossing pipelines in construction. They should be transported to specified road bed filling points or specified location for unified disposal. 9. Prevent construction Machinery from seriously spilling oil, and prohibit the untreated oil sewage produced by the mechanical operation or maintenance of construction machinery from being directly discharged.		
Solid waste Pollution control regulations for solid waste disposal		1. Building rubbish shall be recycled or disposed of through sanitary landfills. 2. Domestic garbage shall be timely transported to designated locations as required by the sanitation department for treatment, to avoid polluting ambient environment. 3. Since the construction sites are disperse and engineering spoils are to be collectively packed into the waste disposal areas on each site, which, however, shall be processed with ecological afforestation to lower water and soil loss. 4. The construction site shall favorably provide professional ethics education to drivers jointly with the departments taking charge of transportation, to direct them to drive on regulated routes and to clean up materials and waste slags to prescribed places in specified time, in associate with irregular inspection.	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations
Ecological environmental protection regulations	Measures for vegetation protection	1. Satisfactorily preserve existing farmlands and forests. It is recommended to provide related trainings to construction staff prior to the use of temporary lands. Civilized operation shall be reinforced during construction and no damage beyond the project is allowed. Strengthen management, request to strictly protect forests and vegetations within the temporary lands, and try best to decrease destruction to alongside ecological environment. 2. As for temporary lands, they shall be leveled and rehabilitated or be greened and afforested after project completion. 3. Areas of vegetations damaged during project construction shall be strictly controlled and in addition to inevitable land occupation and timber cutting, no other artificial damage in any form is ever permitted. 4. Construction personnel shall accept strengthened education about natural resources and wild animal protection awareness and in their employment contract shall strictly ban them to randomly cut down trees. 5. Upon construction completion, roads shall be hardened and open spaces greened in time, to recover and	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations

Type		Environmental protection measure	Execution unit	Supervision unit
		rehabilitate the vegetation.		
	Brick protection measures	1. At the time of construction, it needs to try best to lower or avoid occupying unnecessary lands and within the scope of project site, operations shall comply with the greening design requirements. 2. Reasonably plan the use of temporary lands for pipeline construction, try best to lower the occupation of farmlands and strictly control width of the operation belt. 3. With respect to pipeline ditches, they shall be excavated and preserved hierarchically, the same as their backfilling. At the time of earthwork excavation and backfilling, surrounding areas for temporary piling of such earthworks shall be retained by straw bags or rails. Plots where excavation and construction have finished, it is necessary to timely plant vegetation for greening. Earth excavation and backfilling shall be at non-flood seasons as far as possible, with protections to working surfaces in advance. 4. Additionally install necessary temporary rainwater heads based on requirements, compact exposed grounds and try best to mitigate the flushing of rainwater to soils and lower water and soil loss.		
water and soil conversation pollution control regulations		1. The excavation and engineering shall avoid the rainy season. 2. Upon construction completion, temporary lands acquired shall be cleaned off and renovated, to dismantle all temporary buildings, sweep the ground, re-loosen the close-grained soils that are compacted, earth up and level up the depressions, perform greening works and lower water and soil loss to the minimum. 3. Earthworks on the construction site shall be reasonably piled, to keep a certain distance from rivers, avoid their flowing into rivers and decreases the effects of water and soil loss on nearby rivers; around the filed for sand and stone materials shall yard straw bags to ward off sands and simple ditches shall be excavated around to lead off ponding on the site. 4. Strip off compost soils on the earth's surface to collectively pile them up at appropriate nearby locations on lands acquired for construction and strictly delimit the scope for soil storage and piling on the stacking yard, in association with simple walls to retain wind and water. 5. Set up drainage ditches around the construction site, equipped with desilting basin at the exits in association with the terrain, to direct water flowing through such desilting basins and sedimenting prior to their discharging to natural channels nearby. 6. Upon the completion of constructions on temporarily acquired lands, it needs to timely return them to farmers for second plowing. The construction units shall ensure to recovery these temporarily acquired lands back to cultivatable conditions. 7. Construction vehicles shall be driven strictly following the design roads and avoid randomly grind to damage original surface, destroy vegetation, and cause new water and soil loss. 8. During construction, damages to overground vegetations shall be eliminated as far as possible and it is appropriate to act according to circumstance to select the most suitable construction seasons, avoiding the peak period of vegetation’s growth; as for construction in forests, it needs to operate manually and shorten the operation areas.	contractors Construction Unit	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations

Type	Environmental protection measure	Execution unit	Supervision unit
Environmental Implementation Regulations in Construction Campsite	1. Under the premise of general planning for the project, the campsite planning work is uniformly and comprehensively finished by the project department, and factors such as water delivery, power supply, environmental health, fire fighting device and publicity facilities must be rationally considered during the campsite planning. Privately setting up or dismantling temporary building is forbidden. 2. Items such as hanging flags, posting slogans or warning signs and setting up publicity columns shall be uniformly planned by the project department, and all contents involved must be approved by the project department before delivering to relevant departments for specific implementation. The above items are prohibited to be done by any person without authorization. 3. Campsite house and road building must meet the requirement of fire safety, and the road must be ensured to be unblocked. Fire hydrants and other measures shall be added regarding the parts that fire engines cannot reach. 4. Any activity irrelevant to the project construction is strictly prohibited for any unit and person within the campsite, and it shall be uniformly arranged and managed by the project department. 5. The project department divides the area of responsibility for campsite management of each unit based on the related work environment belonging to each unit. Person in charge of various units is the first principal of the area of responsibility, who must manage the environmental health, fire safety, dormitory management, etc. well in his area of responsibility as per relevant requirements of the project department. 6. Dustbins shall be rationally arranged in various places of the campsite, and rubbish stacking and rubbish and cigarette end discarding are prohibited in the site and corners. Various units shall timely clear the dustbins within their area of responsibility to prohibit the phenomenon of dustbin overflow. 7. Various units shall attach importance to the sanitation and hygiene in the toilet and bathroom to realize an environment without smell, ponding and sundries. 8. The project department shall often prepare various first-aid medicines, strictly control the inbound channel and regularly inspect the inventory status to prevent the application of quack medicines and expired drugs; as for toxic and habit forming drugs and psychotropic substances, it must execute it in strict accordance with the national level drug administration law. The project department must establish the management system for various special projects, and seriously follow and execute it. 9. It is not suitable to select the following places as the construction campsite: 1) Residence, school and other main sensitive spots and the land within the range of 200m of upwind; 2) Prime farmland 3) The land within the range of 1000m of upriver and 500m of downriver of the drinking water point, and the range of the drinking water protected areas; other sensitive areas such as scenic spots and forest parks; 4) Collapse and landslide danger zone; 5) Susceptible area of debris flow; 6) The land with special purpose;	Contractors	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations

Type	Environmental protection measure	Execution unit	Supervision unit
Environmental Implementation Regulations in Construction Campsite	1. Items such as renting the residences along the project as possible, and setting up living garbage collection points or garbage gathering barrels shall be done; electric energy or other clean energies shall be used as the source of residential energy resources and heating. 2. Constructors shall abide by the local village regulation and non-governmental agreement, construct civilized construction and treat well the relation with local residents. 3. The production campsite is set with pit toilet and sedimentation basin for production wastewater. The production wastewater is used for production again without discharging after sedimentation, and the local residents are employed to transport the sanitary sewage (toilet used by constructors) after treatment of pit toilet outside for agricultural irrigation; covering soil and burying are done after the construction. 4. The production campsite shall be preferentially selected at the inferior land with occupying cultivated land forbidden; when the cultivated land occupying cannot be avoided for production campsite, the basic farmland is prohibited to occupy; the tillable surface soil shall be stripped before construction, temporarily piled at the relatively smooth area of the site with adopting the bag soil to build temporary block, setting up temporary drainage ditch and sand setting measures in the surrounding, and using dust screen for covering, and used for covering soil, second plowing or planting soil greening in the production campsite after the construction.	Contractors	Provincial project office and subproject offices of the four counties Zhejiang Environmental Protection Bureau and local environmental protection administrations
Protection regulations on construction safety environment	1. No drinking is allowed during work, and people drinking under special circumstances are not allowed to work. 2. Gathering together to gamble, going whoring, stealing, fighting and making trouble are forbidden. 3. Safety helmet, protective garment and other labor protection appliances shall be distributed to the staff. 4. Constructors shall dress as per the regulation during working, wear labor protection appliances, and correctly wear the safety helmet. 5. The staff shall be often given with safety education, fire disaster, explosion, poisoning and other major public disaster accidents shall be actively prevented, besides, various rules and regulations shall be strengthened. 6. Constructors shall be ensured with healthy body and without carrying infectious diseases, and the project department takes charge of regularly conducting health survey for constructors and preventing the transmission of diseases.	Contractors	Provincial project office and subproject offices of the four counties

Table 4-3 Environmental Protection Regulations at the Operation Phase

Subproject	Environmental factors	Mitigation measure	Execution unit	Supervision unit
Sewage Disposal Plant	Noise	1. Low-noise equipment shall be selected, and the equipment foundation shall be set with vibration pad to reduce the noise caused by equipment vibration. 2. The air compressor shall be set with silencer, silencer and pedestal shock pad, and set with specialized plant adopting double glazing; the air blower shall be installed with silencer. 3. Regular checking, maintenance and management shall be enhanced for various mechanical equipment and its noise reduction devices, and it shall be timely replaced in case of any fault in equipment, so as to reduce the mechanical noise caused the abnormal running of machinery. 4. Pumps in the sewage pumping station shall be set with anti-vibration pad, and the pump house is set with sound insulation doors and windows.	Operation and Maintenance Unit	Zhejiang Environmental Protection Bureau and local environmental protection administrations
	Atmosphere	1. Meixi River Sewage Disposal Plant requires to cap the aerobiotic biochemical pool, fine rack grit basin, dehydration machine room and other structures for sealing collection (the gas collection rate is not lower than 95%), and adopts the plant extract atomization and oxidation system to treat stench; the removal efficiency of H2S, NH3 and other odor pollutants is not lower than 95%. 100m of width of sanitary protection zone is set. 2. AnJi Sewage Disposal Plant caps the coarse screen and influent pump station, fine rack and rotational flow desiting basin, biochemical pool, secondary sedimentation tank, mud storage pool, thickener room, dehydration machine room, etc. for sealing collection (the gas collection rate is not lower than 80%), and adopts the biological deodorization tower to treat stench (the removal efficiency is not lower than 80%). 150m of width of sanitary protection zone shall be set, and part of scattered spots of villagers in Hehuatang Village located within the protection zone is in need of demolition. 3. Air draft is adopted in the fourth-phase project of Fuyang sewage disposal to keep the collecting zone in micro-negative pressure status, thus preventing the overflow of odor pollutants internally created from influencing the environment; the collected odor pollutants are treated with bacteria bed for deodorization, and the off-gas up to the standard after treatment is discharged to the external environment via the exhaust funnel with release height not lower than 15m. Meanwhile, capping reform is implemented for the first, second and third-phase project of Fuyang Sewage Disposal Plant to collect and treat the stench generated. Displacement and resettlement for Minfeng Village at the southeast side of the plant boundary shall be finished before the operation period of the fourth-phase project. 4. 100m of width of sanitary protection zone needs to be set in the Longquan Xiaomei Town sewage plant, Lanju Township sewage disposal plant, Badu Town sewage disposal plant, Chatian Town sewage disposal plant, Anren Town sewage disposal plant, etc., and no housing estate shall be allowed within the width of sanitary protection zone. 5. Tiantai Cangshan sewage disposal plant caps the primary settling tank, anaerobic tank and secondary		

Subproject	Environmental factors	Mitigation measure	Execution unit	Supervision unit
		sedimentation tank, requires to seal the sludge-tank, dehydration machine room, sludge shed and other stench source points, and sets up flue gas gathering fan; the collected flue gas is sent to the deodorization reactor for treatment and then discharged into the upper air; biological deodorization method is the first choice, and the deodorization efficiency can be stabilized at about 80%. 100m of width of sanitary protection zone needs to be set and no housing estate shall be allowed within the width of sanitary protection zone. 6. Straightening the greening of plant area, and adopting the multi-layer protective green belt of tree, shrub and vegetation combination.		
	Sludge and solid waste	1. Sludge yard within AnJi Meixi Sewage Disposal Plant shall be set with rain-shed, and collecting basin at its surrounding; sludge after dehydration may be sent to Wangneng Incineration Plant for incineration disposal. 2. Sludge produced in the fourth-phase project of Fuyang Sewage Disposal Plant shall be sent to Zhejiang Qingyuan Ecological Thermoelectricity Co., Ltd. for concentrated disposal with incineration disposal facilities after thickening and dehydration in the plant, and sludge produced shall be monitored and kept with the original monitoring record. 3. The sanitation department may be entrusted to regularly clear and uniformly dispose the waste sundry and household refuse produced by Longquan Anren Sewage Disposal Plant, Badu Town Sewage Disposal Plant, Chatian Town Sewage Disposal Plant, Lanju Township sewage Disposal Plant, Xiaomei Town Sewage Disposal Plant, etc. Sludge after filter pressing and dehydration is done with composting process, and the compost is used for the farmland or mountain land near the project. 4. Sludge produced by Longyang sewage disposal plant of Fuyang is regularly sucked out by fecal suction truck, and transported to Qingquan Environmental Thermal Power Plant for incineration disposal. 5. Sludge produced by Cangshan sewage disposal plant is recently sent to Tiantai County refuse landfill for landfill. 6. Household refuse produced by sewage disposal plants is regularly cleared for sanitary landfill by the local sanitation department. 7. The solidified sludge shall be equipped with special purpose vehicle for outward transport during transporting, and the sludge transport vehicle shall be sealed, waterproof and free from leakage, and ledges around the vehicle shall be firm, reliable, unbroken and tight in baffle; before driven out of the loading site, the vehicle ledges and wheels shall be washed clear without carrying mud during traveling and leaking on the way; in case of leakage found during transporting, it shall be timely cleaned up. Sludge transporting shall be kept away from the resident gathering points, water conservation districts, places of interest, resort districts and other environmental sensitive areas as possible.		
	control of source	1. The municipal department shall actively do well in the sewage cleaning and diversion work of sewage pipe network to avoid a large number of rainwater entering the sewage disposal plant. Relevant		

Subproject	Environmental factors	Mitigation measure	Execution unit	Supervision unit
		department shall complete the management work of pipe entry enterprises, water quality entering the pipe must reach the inlet standard, high concentrated organic wastewater and harmful and toxic substances concentration shall be strictly controlled according to the inlet standard. 2. The operation condition of sewage disposal facilities shall be timely understood so as to ensure the normal running. The inflow and effluent quality shall be regularly monitored, and the running status of the processing unit shall be timely adjusted based on different water volume and water quality, so as to ensure the optimal treatment efficiency. 3. Relevant department shall enhance the treatment for industrial pollution sources, especially for the first-class pollutant, various pollutant-holding enterprises are required to conduct pretreatment in the plant, strictly control the discharge of poisonous and harmful substances and ensure the normal running of sewage disposal facilities. 4. Meixi Sewage Disposal Plant shall accelerate its pace in perfecting its advanced treatment system and reuse system of reclaimed water, and putting it into operation, thus ensuring the water quality of sewage disposal plant reaches the standard and reducing the environmental emission of sewage. 5. Monitoring for water pollution shall be enhanced, including the monitoring on inflow and effluent quality and quantity.		
	Environmental risks	1. Establish a reliable operation monitoring and controlling system, including metering, sampling, monitoring, alarm and other facilities, monitor the water quality and quantity entering the plant in real time, and timely adjust the running parameter in case of any abnormal conditions so as to control and avoid the occurrence of accidents. 2. During the project design, standby machines should be sufficient; enhance the maintenance and management of facilities, improve the serviceability rate of equipment, equip enough spare parts for mechanical equipment, and ensure the double circuit power supply of power source. Timely replacement can be conducted in case of any accident. 3. Strengthen the inspection, daily maintenance and management on tail water discharge pipes of sewage disposal plants to ensure the safety operation of discharge pipes. 4. Enhance the water quality field monitoring of nearby water areas of sewage disposal plant, accumulate basic data on the one hand and prevent sewage discharge under the abnormal working condition on the other hand to further protect the water quality environment of pollutant-holding water. 5. Establish perfect file system, record the treatment effect condition of sewage disposal facilities and tail water quality change condition caused by water quality and quantity entering the plant, and especially record the working condition during accident for the convenience of summarizing experience and completely eradicating the reoccurrence of accidents. 6. Set up obvious warning mark at the sensitive road section of pipe installation to prevent the influence of brutal construction and other human factors of other project on sewage pipe lines. Strengthen the		

Subproject	Environmental factors	Mitigation measure	Execution unit	Supervision unit
		inspection, maintenance and management on sewage delivery pipe lines, regularly inspect delivery pipe lines, and avoid the accident risk of pipe line fracture. 7. Formulate the emergency plan for accidents of sewage disposal plants		
	Others	1. Establish sewage disposal plant running management and operational responsibility system; do well in staff training, establish technical examination files, and forbid the unqualified people from working. 2. It is recommended that in the future planning of relevant departments, new residence zone, hospital, school and other sensitive buildings are prohibited to build within the width of sanitary protection zone set in the sewage disposal plant.		
water plant	Noise	1. Select the low-noise equipment as possible, and adopt shock absorption, sound insulation and other measures for main noise production equipment (electromotor, etc.). 2. Adopt overall sound insulation measures for pump house. 3. Conduct civilized and normalized operation and ensure the good running state of equipment. 4. Pumps in the sewage pumping station shall be set with anti-vibration pad, and the pump house is set with sound insulation doors and windows.	Operation and Maintenance Unit	Zhejiang Environmental Protection Bureau and local environmental protection administrations
	Atmosphere	1. Auto and sealed chlorine dioxide generator is used in the water plant, and workers operate in the control room far away from the production equipment, and ventilation and detoxification are enhanced. Individual protection must be done well. 2. Straighten the greening of plant area, and adopting the multi-layer protective green belt of arbor, shrub and vegetation combination.		
	Surface Water	1. Domestic sewage of Gaoyu Water Plant and Banshan Water Plant in AnJi County is discharged into the municipal sewage pipe network after treatment in the digestion tank. The water plant is set with recycling pool to discharge into the backwash wastewater of filter chamber, and the wastewater is sent to the steady-pressure distributing well by lift pump after adjustment, and enters water purification process for re treatment and utilization without discharging outside. Sludge water of plate flocculation tank and horizontal sedimentation tank is discharged into the sludge discharge tank, mud and water are separated after sedimentation and percolation, the liquid supernatant is discharged into the nearby river, and the intercepted sludge is cleared by manual work after drying. 2. The sewage after preliminary treatment at the septic-tank is discharged into the municipal sewage pipe network.		
	Solid waste	1. Mud cake produced by Gaoyu Water Plant and Banshan Water Plant in AnJi County shall be sent to Wangneng Incineration Plant for incineration disposal. 2. Temporary storage site is set within the plant for sludge produced by Nandayang Water Plant of Longquan City, the ground is hardened with cement setting up cofferdam around it and covering the ceiling, and then the sanitation department may be entrusted to send it to the refuse landfill for sanitary landfill after temporary storage.		

Subproject	Environmental factors	Mitigation measure	Execution unit	Supervision unit
		3. Household refuse of staff in various water plants shall be regularly cleared and disposed by the local environmental sanitation department.		
	Others	1. Establish a reliable operation monitoring and controlling system 2. Enhance the maintenance and management of facilities, and improve the serviceability rate of equipment; 3. Establish perfect water quality file system; 4. Strengthen the protection for water source quality of various water plants, divide drinking water conservation district, conduct management in strict accordance with the protection and management regulations on drinking water source, and ensure the safety of water source. 5. Formulate the emergency plan for accidents of water source pollution		

Table 4-4 Environmental Protection Regulations on Rural Decentralized Sewage disposal Project

Epoch	Environmental factors	Mitigation measure	Execution unit	Supervision unit
Design period	Atmospheric Environment	Site selection of cement mixing shall be far away the residential buildings as possible.	Design and construction unit	The local environmental protection administration Provincial project office and subproject offices of the four counties
	Ecological Environment	Occupy less cultivated land as possible, scientifically select the site and design the control measures.		
Construction Period	Atmospheric Environment	Dust suppression measures such as watering or covering the storage yard are adopted for the temporary stacking place, and covering the compartment with canvas and watering on the transport route with soil road are adopted for automobiles transporting crushed aggregates (keeping the sealed transportation).	Contractor and Building Unit	
	Water Environment	Domestic sewage of constructors must be used for farm irrigation or mountain forest greening without random discharging after reaching the standard. 2. Muddy water from the site shall firstly be collected into settling ponds for sedimentation, to discharge the supernatant liquor, while mud left may be delivered externally for landfill upon desiccation; or may be used as filler of the project in association with practical road greening.	Contractor and Building Unit	
	Disposal of Solid Waste	Sanitary landfill shall be done for construction waste; household refuse shall be timely transported to the place assigned by the sanitation department for disposal; engineering spoil shall be intensively piled at the waste disposal area in each construction point, ecological afforestation and flood control ditch building shall be timely done to reduce water and soil loss upon the completion of construction.	Contractor and Building Unit	
	Acoustic Environment	The construction work time shall be rationally arranged, and strong-noise construction shall be prohibited during the night; low-noise equipment and low-noise construction method shall be possibly used and advanced construction technology and low-noise equipment shall be adopted.	Contractor and Building Unit	
	Ecological Environment	Timely restoration must be done for the temporarily occupied land.	Contractor and Building Unit	
Operating Period	Disposal of Solid Waste	It is suggested that the sludge shall be agriculturally utilized to solve the problem of rural organic fertilizer or sent to the urban sewage disposal plant for disposal by fecal suction truck.	Operation and Maintenance Unit	all counties (cities) Environmental Protection Bureau

Table 4-5 Fuyang Sewage Phase IV Project Environmental Regulations

Subproject Name	Category of Impact	Measures for Mitigating Impact	Executor	Supervisor
Phase of Design	1. Further optimize craft, structure parameters and plane layout and retain certain amount of design margin, load elasticity and space of expansion. Based on ensuring stable discharging of the project on standard, leave some leeway for future boost in development of scale and depth of treatment. 2. Further optimize design in discharge outlet, set standardized discharge outlet based on relevant standards and set online monitoring facilities in accordance with relevant requirements.		Design Unit and Construction Unit	County Project Office
Construction Period	1. Set temporary fence facilities at the construction site, meanwhile, try to reduce open-air stacking of construction dinas materials as much as possible to prevent wind dusting; equip with temporary watering facilities to water raising dust at the construction site. 2. A temporary drainage ditch should be set around the construction site to collect muddy water such as rainwater at the site and water at the foundation pitch. By adopting the method of sediment in the temporary settling pond, treat before discharging and prevent muddy water from being discharged into urban sewer and nearby water bodies. 3. Strengthen the management of sanitary sewage and household garbage of construction workers and set temporary septic-tank to treat sanitary sewage; set fixed collection site of household garbage to collect household garbage of construction workers and incorporate it into local garbage clearance disposal system. 4. Set rinse sites for construction vehicles to rinse construction vehicles in and out of the construction site in time; construction vehicles should be capped with tarpaulin to prevent environmental pollution resulting from scattering of earth, rock and construction materials. 5. Make reasonable arrangement on construction procedures and service construction machinery in time to ensure that the construction site meets the requirements of *Noise Limits for Construction Site*. 6. Carefully verify the amount of earth-rock work required by the project and try to prevent surplus earth-rock work as much as possible. Meanwhile, in the filling process, the construction unit should notice that timely punning should be made on the earth-rock work to be filled to prevent soil erosion.		Contractor and Construction Unit	Zhejiang Environmental Protection Bureau and Fuyang Environmental Protection Agency
Operation Period	Water	1. The municipal department should take positive measures in the	Unit of Operation and	Zhejiang Environmental

	Environment	decontamination triage of sewage network, preventing substantial rainwater from flowing into sewage treatment plant. 2. The quality of water in the pipeline should meet relevant standards and high-density organic wastewater and the concentration of harmful and poisonous substance should be strictly controlled based on relevant standards; make online monitoring and surveillance on inflow water quantity and quality and network with supervision authorities; strengthen monitoring management on the takeover of enterprise sewage which meets standards. 3. Make regular monitoring on the quality of inflow and outflow water and modify the operation of treatment unit in time in compliance with water quantity and quality, ensuring the best treatment efficiency.	Maintenance—Fuyang Water Group	Protection Bureau and Fuyang Environmental Protection Agency
	Environmental Risks	1. Double-loop is required in design for power supply facilities of the project to reduce environmental risks resulting from power failure. 2. Emergency plan on accident handling for the project shall be formulated before operation. Implement respective responsibilities of construction workers, meanwhile, do drills in ordinary days to deal with accidents in time. 3. When an accident happens, relevant administrative authorities including environmental protection, water and municipal administration shall be notified in time in accordance with emergency plan on accident handling. Reduce the discharging capacity of accident outlet water and mitigate its pollution to the Qiantang River by suspending the discharging of key industrial pollution sources to urban trunk sewers. 4. Establish a reliable operation monitoring system including facilities of measurement, sampling, monitoring and alarming so that operation parameters could be modified in time when abnormal situations are found, controlling and preventing the occurrence of accident. 5. Strengthen the inspection, maintenance and management on the pipelines for the outflow to the river. Since pipelines for the outflow to the river tend to be influenced by the tidal bore of the Qiantang River, it is necessary to contact the Qiantang River Administration Bureau in time so as to ensure the safe operation of pipelines for the		

		outflow to the river.		
	Ambient Air	1. For various stench sources in the process of sewage treatment and backflow, collection and treatment of sludge, the capping method is adopted in airtight treatment and biofilter and other deodorization technologies of the same effect are adopted to make sustained and stable treatment up-to-standard discharging on stench pollutants. The height of discharging shall be higher than 15 m. 2. Adopt automatic monitoring to supervise the deodorization effect and concentration of stench pollutants in the confined space. Adopt timely remedial measures in case of discovery of abnormal situations, ensuring personnel safety and reducing environmental impact. 3. Make virescence in the plant to reduce the environmental impact of malodorous gas. The rate of virescence shall be more than 20%.		
	Solid Waste	1. Sludge shall be sent to incineration treatment facilities of Zhejiang Qingyuan Ecological Thermoelectricity Co., Ltd. for centralized disposal. 2. Monitor sludge and keep original monitoring records based on regulations. 3. The solidified sludge shall be transported outward by special purpose vehicle during transporting, and the sludge transport vehicle shall be sealed, waterproof and free from leakage, and ledges around the vehicle shall be firm, reliable, unbroken and tight in baffle; before being driven out of the loading site, the vehicle ledges and wheels shall be washed clear without carrying mud during traveling and leaking on the way. 4. Sludge transporting shall be kept away from the resident gathering points, water conservation districts, and places of interest, resort districts and other environmental sensitive areas as possible. 5. Record reporting system shall be implemented in the generation, storage, transfer and disposal of sludge in the project. Summarize and report to authorities of environmental protection quarterly,		

		semi-annual and annual Industrial Enterprise Statistical Ledger on Use and Disposal of Sludge in early April, early July, early September and early January next year respectively. 6. The project shall make planned audit record and management on transfer receipts on the transfer and disposal of sludge. Submission of transfer plan in advance is required by environmental protection administration for the transfer and disposal of sludge. Declaration to the environmental protection administration shall be made in advance if changes happen to the nature, quantity of transfer, destination and transport route of sludge.		
	Noise	1. Select facilities of lower noises; 2. Set silencer for facilities such as air blower and the noise reduction is higher than 20dB; no window is set for the walls of air blower room and dehydration machine room; 3. Strengthen the management and maintenance of transport vehicles, restrict vehicle speed in noise-sensitive areas and prohibit whistling. 4. Strengthen regular inspection, maintenance and management of various mechanical facilities and the noise reduction facilities thereof and replace facilities of breakdown in time, reducing mechanical noise due to abnormal operation of machinery.		
	Others	1. Set 2 underground water quality surveillance wells in the current project plant areas and Phase-IV Expansion Project plant areas to monitor underground water quality periodically. 2. Complete removal settlement of Minfeng Village, southeast of the plant before the operation term of Phase-IV Project. 3. Guarantee daily clearance of sludge in the plant and sludge is not allowed to be stacked in the plant area; air blower and dehydration machine room which generate high noise shall be ensured to operate in the status that doors and windows are shut. 4. Capping and transformation are implemented on Fuyang Sewage Plant Phase-I, II and III projects. Make collection and treatment on the stench.		

5. Supervision plan of environmental protection

Refer to Table 5-1 for supervision plan on project environmental protection.

Table 5-1 Supervision Plan of Environmental Protection

Stage	Institution	supervision content	Supervisory purpose
feasibility study phase	Zhejiang Environmental Protection Bureau Environmental protection agencies of the four counties The World Bank Provincial project office and subproject offices of the four counties	1. Check the environmental impact report; 2. Check EMP;	1. Ensure that all important and potential problems possibly produced by this project have been reflected; 2. Ensure there are specific and feasible implementation plans for environmental impact mitigation measures.
Design and construction Stage	Zhejiang Environmental Protection Bureau Environmental protection agencies of the four counties The World Bank Provincial project office and subproject offices of the four counties	1. Check the preliminary design for environmental protection and EMP; 2. Inspect whether the investment in environmental protection is implemented; 3. Inspect the control measures for dust and noise pollution, and determine the construction time; 4. Inspect the discharge of air pollutants; 5. Inspect the discharge and disposal of domestic sewage and production wastewater in the construction site; 6. Inspect the “Three Simultaneousness” of environmentally protective facilities, and confirm the final time of completion; 7. Inspect the implementation of monitoring plan; 8. Inspect whether the environmentally protective facilities reach the standards;	1. Strictly execute the “Three Simultaneousness” system; 2. Ensure the investment in environmental protection; 3. Ensure these places meet the environmental requirement. 4. Reduce the influence of construction on the ambient environment and execute relevant environmental regulations and standards; 5. Ensure the receiving water quality is not seriously polluted; 6. Ensure the landscape and land resource are not seriously damaged so as to avoid water and soil loss; 7. Ensure the “Three Simultaneousness” system; 8. Check and accept the environmentally protective facilities.
operation Stage	Zhejiang Environmental Protection Bureau Environmental protection agencies of the four counties	1. Inspect the implementation of EMP during the operation period; 2. Inspect the implementation of monitoring plan; 3. Inspect the sensitive spots where further environmental protection measures are necessarily adopted (there may be some environmental problems out of estimation); 4. Inspect whether the environmental quality of the environmental sensitive spots meets the requirement of its relevant quality standard; 5. Enhance the supervision, prevent unexpected accidents, and formulate relevant solutions on emergency accidents in advance, which can timely eliminate the danger in case of any accident.	1. Implement EMP; 2. Implement the monitoring plan; 3. Protect the environment feasibly; 4. Intensify environmental management, and protect the population health practically; 5. Ensure the sewage discharge meets the discharge standards; 6. Eliminate the accident potential and avoid vicious environmental pollution event.

6 Environmental Monitoring Plan

6.1. Purpose

Environmental monitoring contains the construction and operation periods, whose purpose is to master the pollution dynamic of the proposed project comprehensively and timely, learn about the influence degree and scope on regional environmental quality from project construction and the dynamic of environmental quality, timely reflect relevant information to the competent departments of environmental protection, and provide a scientific basis for environmental management of the project.

Formulating environmental monitoring plan is to supervise the implementation of various measures, timely adjust the action plan of environmental protection based on the monitoring results, and provide a basis for the implementation time and plan of environmental protection measures. The implementation of environmental monitoring plan will contribute to timely understanding the environmental quality of the project area, analyzing the influence of project construction on the environment as well as giving targeted mitigation, and ensuring the influence of project construction on environment reduces to the lowest, without impacting the life of people and damaging the natural ecological environment.

6.2 Monitoring Institution

Based on the specific circumstance of the project, generally, large-scale sewage disposal plant is equipped with certain monitoring equipment, which bears certain monitoring ability; monitoring of the subproject with monitoring ability can be completed by its own monitoring analysis institution or entrusted to the qualified local monitoring institution. Environmental monitoring of the subproject without monitoring ability can be entrusted to the qualified monitoring institution.

Advantages of entrusting the professional monitoring institution to bear the monitoring task include two aspects: on the one hand, it can exert the advantage of complete professionals and perfect monitoring equipment in the existing environmental monitoring unit; on the other hand, the project management agency can save the investment on monitoring equipment and personnel cost.

6.3 Monitoring Implementation

Take sensitive focus points with more apparent character for pollution as the monitoring points on the basis of the environmental impact prediction results and select surface water, ambient air, acoustic environment and underwater easily to be impacted as monitoring content on the basis of pollution conditions during construction period and running period. Monitoring factor shall be determined by pollution characteristics factor in project analysis, monitoring analysis methods adopt that related to the project specified in Environmental Monitoring Technical Specifications and evaluation criterion follows national standards confirmed by Environmental Impact Assessment (EIA).

The monitoring responsible institution is the building unit or Contractor of various subprojects during construction, and the operation and maintenance unit of various subprojects during the operation, and the supervising unit is Zhejiang Environmental Protection Bureau and the local environmental protection bureaus of various subprojects.

6.4 Monitoring Plan and Fund Demand

Monitoring plan and cost estimate of various subprojects are shown in Table 6-1.

The implementation costs of subproject surveillance plans shall be afforded by domestic funds.6.5 Environmental Monitoring Report

(1) Environmental monitoring report during the construction period

During the period of construction, the building unit or Contractor for subprojects of relevant county (city) shall entrust the local monitoring station or qualified monitoring institution to monitor the environment of atmosphere, noise, nearby surface water body and ground water, and to report to the local environmental protection administration. Report content in this stage include the progress of works, main construction content and methods, environmental implication comment and the implementation of mitigation measures for environmental implication, operation conditions of refuse landfill and sludge incineration plant, and environmental protection conformance conditions. During the period of project construction, monthly report shall be issued and reported to the provincial project office and Zhejiang Environmental Protection Bureau and relevant county (city) environmental protection bureaus.

Various subproject offices shall synthesize the monitoring report of various subprojects, summarize and compile the report of construction environment monitoring for regional subprojects semiannually, and send it to the provincial project office, who will report this report to the World Bank.

(2) Environmental monitoring report during the operation period

During the operation period of this project, the operation and maintenance unit of various subprojects shall conduct the environmental protection monitoring for the project running status as per the requirement of Environmental Impact Assessment, and submit monitoring report to the local environmental protection administration semiannually.

Contents of the monitoring report mainly include:

① Operation conditions of various subprojects, including that of environmental protection measures;

② Monitoring factor, monitoring time, frequency, monitoring PT and method;

③ Monitoring data and statistic analysis

④ Sludge disposal conditions, including environmental protection standard-meeting conditions of Longquan Gaotang Refuse Landfill, Tiantai County Refuse Landfill, sludge incineration of AnJi Wangneng Renewable Resources Utilization Co, Ltd. and Zhejiang Qingyuan Ecological Pyroelectricity Co., Ltd.

Table 6-1 Environmental Monitoring Plan and Cost Estimate of Various Subprojects

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
Fuyang Area										
Trial Project of Scattered Rural Sewage Treatment System in Fuyang (The First Batch)	Construction Period	Atmosphere	During the construction peak period, it shall be done with 1 time/year, and 3 days for each time.	Hongzhuang Village in Yinhu Subdistrict, Pengjia Village in Wanshi Town and Yankou Village in Dayuan Town	TSP	3285	25125	Environment Monitoring Institution	Fuyang Water Co., Ltd. or Contractor	Fuyang Environmental Protection Bureau
		Noise	During the construction peak period, it shall be done with 1 time/month, with frequency of 1 time/day; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Hongzhuang Village in Yinhu Subdistrict, Pengjia Village in Wanshi Town and Yankou Village in Dayuan Town	LAeq	6480				
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Baiyang Stream, Nanyang Stream and Dayuan Stream	CODcr, NH3-N, SS, pH, Petroleum	15360				
	Operating Period	Noise	1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of 3 sewage stations	LAeq	2160	19284		Fuyang Water Co., Ltd.	
		Atmosphere	1 time/year (summer), 2 days/time and 4 times for each day.	Field of 3 sewage stations	H2S and NH3	7200				
		Surface Water	1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day.	Baiyang Stream, Nanyang Stream and Dayuan Stream	CODcr, BOD5, NH3-N, TP	4020				
		Ground Water	1 time/year, 2 days/time, and 1 time separately in the morning and afternoon of each day.	Monitoring wells near 3 sewage stations	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	5904				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
Rural Joint Water Supply and Drainage Facilities Perfecting Project of Xindeng Town, Fuyang	Construction Period	Atmosphere	One natural village can be selected for monitoring with 1 time/year and 3 days per time during the construction period.	Construction Point	TSP	1095	13495	Environment Monitoring Institution	Fuyang Water Co., Ltd. or Contractor	Fuyang Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				
		Water Body	Each section of Luzhu River and Songxi Stream may be selected for monitoring with 1 time/season, 2 days/time and 1 time separately in the morning and afternoon of each day.	Luzhu River and Songxi Stream	CODcr, NH3-N, SS, pH, Petroleum	10240				
Rural Joint Water Supply and Drainage Facilities Perfecting Project of Dayuan Town, Fuyang	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time and sampling time not less than 12h each day.	Construction Point	TSP	1095	8375	Environment Monitoring Institution	Fuyang Water Co., Ltd. or Contractor	Fuyang Municipal Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				
		Water Body	One section of Dayuan Stream may be selected for monitoring with 1 time/season, 2 days/time and 1 time	Dayuan Stream	CODcr, NH3-N, SS, pH, Petroleum	5120				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
			separately in the morning and afternoon of each day during the period of construction.							
Fuyang Longyang Sewage Treatment Project	Construction Period	Atmosphere	Monitoring is done with 1 time/year and 3 days per time during the period of construction.	Chenlin Village	TSP	21095	28375	Environment Monitoring Institution	Fuyang Water Co., Ltd. or Contractor	Fuyang Municipal Environmental Protection Bureau
		Noise	During the construction period, it shall be done with 1 time/month, and the frequency of 1 time/day; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Chenlin Village	LAeq	2160				
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Gexi River	CODcr, NH3-N, SS, pH, Petroleum	5120				
	Operating Period	Noise	1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of Longyang Sewage Disposal Plant	LAeq	720	7488		Fuyang Water Co., Ltd.	
		Atmosphere	1 time/year (summer), 2 days/time and 4 times for each day.	Chenlin Village	H2S and NH3	2400				
		Surface Water	1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day. 2 sections are set at the upstream and downstream of the discharge outlet.	Gexi River	CODcr, BOD5, NH3-N, TP	2400				
		Ground Water	1 time/year, 2 days/time, and 1 time separately in the morning and afternoon of each day.	Monitoring wells near the sewage plant	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				
The Fuyang Sewage	Construction Period	Atmosphere	During the construction peak period, it shall be done with 1 time/year, and 3 days for each time.	Construction Point	TSP	1095	8375	Environment Monito	Fuyang Water Co., Ltd.	Zhejiang Provincial Environmen

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
Disposal Plant Project Phase IV		Noise	During the construction peak period, it shall be done with 1 time/month, with frequency of 1 time/day; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Construction Field	LAeq	2160		ring Institution	or Contractor	tal Protection Bureau Fuyang Municipal Environmental Protection Bureau
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Fuchun River	CODcr, NH3-N, SS, pH, Petroleum	5120				
	Operating Period	Noise	1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of Sewage Disposal Plant	LAeq	720	15888		Fuyang Water Co., Ltd.	
		Atmosphere	1 time/year, 2 days/time, 4 times/day.	Field of Sewage Disposal Plant	H2S and NH3	9600				
		Surface Water	1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day.	Fuchun River, section with 1km away from the upstream of discharge outlet, section of the discharge outlet and section with 1km away from the downstream of discharge outlet	CODMn, BOD5, ammonia nitrogen, total phosphorus and petroleum	3600				
		Ground Water	1 time/year, 2 days/time, and 1 time separately in the morning and afternoon of each day.	Monitoring wells near the sewage plant	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				
Trial Project of Sewage Interception Piping	Construction Period	Atmosphere	During the construction period, 1 point is respectively arranged in 4 townships for monitoring with 1 time/year and 3 days/time.	Construction Point	TSP	4380	42140	Environment Monitoring Institution	Fuyang Water Co., Ltd. or Contracto	Fuyang Municipal Environmental Protection
		Noise	During the construction period, 1 point	Nearby residential	LAeq	17280				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
for Rural Domestic Sewage in Fuyang (The First Batch)			is respectively arranged in 8 administrative villages for monitoring with 1 time/month and the frequency of 1 day/time; it shall be monitored for 1 time separately at the day and night in case of any night construction.	areas				on	r	Bureau
		Water Body	During the construction period, each section of Fuchun River (Fuyang section), Gexi Stream, Baiyang Stream and Shouxiang Stream may be selected for monitoring with 1 time/season, 2 days/time and 1 time separately in the morning and afternoon of each day.	Fuchun River (Fuyang section), Gexi Stream, Baiyang Stream and Shouxiang Stream	CODcr, NH3-N, SS, pH, Petroleum	20480				
Rural Joint Water Supply and Drainage Facilities Perfecting Project of Xindeng Town, Fuyang	Construction Period	Atmosphere	During the construction period, Changkou Village is selected for monitoring with 1 time/year and 3 days/time.	Changkou Village	TSP	1095	8375	Environment Monitoring Institution	Fuyang Water Co., Ltd. or Contractor	Fuyang Municipal Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Changkou Village	LAeq	2160				
		Water Body	One section of Huyuan River may be selected for monitoring with 1 time/season, 2 days/time and 1 time separately in the morning and afternoon of each day during construction period.	Huyuan River	CODcr, NH3-N, SS, pH, Petroleum	5120				
AnJi Area										

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Estimated Cost (Yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
The Perfection Project of Water Supply and Drainage Facilities in Tianzihu Area	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Construction Point	TSP	1095	8375	Environment Monitoring Institution	AnJi Guoyuan Water Group Co., Ltd. or Contractor	AnJi County Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				
		Surface Water	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Hunni Port	CODCr, NH3-N, pH, SS, Petroleum	5120				
Perfection Project of Water Supply and Drainage Facilities in Meixi Area	Construction Period	Atmosphere	During the construction period, two natural villages can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Nearby residential areas	TSP	2190	11630	Environment Monitoring Institution	AnJi Guoyuan Water Group Co., Ltd. or Contractor	AnJi County Environmental Protection Bureau
		Noise	Two natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	4320				
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Xiaoshu Port and Tianzigang Reservoir	CODcr, NH3-N, SS, pH, Petroleum	5120				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
	Operating Period	Noise	1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of Gaoyu Water Plant, Meixi Sewage Plant, 1 water pumping station and 2 sewage lift pump stations	LAeq	3600	20368		AnJi Guoyuan Water Group Co., Ltd.	
		Atmosphere	1 time/year (summer), 2 days/time and 4 times for each day.	Field of Meixi Sewage Plant and Shizijian Village	H2S and NH3	4800				
				Field of Gaoyu Water Plant, Yangqiao Village and Gangxi Village	Cl2	3600				
		Surface Water	1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day. 2 sections are set at the upstream and downstream of the discharge outlet.	Xitiao Stream	CODMn, BOD5, ammonia nitrogen, total phosphorus and petroleum	3600				
			Monitoring is done once in January and July of each year. Sampling is done once at the first ten days of a month in each phase.	Tianzigang Reservoir	Water temperature, pH, TP, DO, CODMn, ammonia nitrogen, petroleum, volatile phenol, fluoride and Fecal escherichia coli index.	2800				
		Ground Water	1 time/year, 2 days/time, and 1 time separately in the morning and afternoon of each day.	Shizijian Village	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
The Perfection Project of Water Supply and Drainage Facilities in Tianhuangping Area	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Construction Point	TSP	1095	8375	Environment Monitoring Institution	AnJi Guoyuan Water Group Co., Ltd. or Contractor	AnJi County Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				
		Surface Water	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Huxi Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	1 water pumping station and 1 sewage lift pump station: 1 time/year, 1 day/time, and 1 time separately at the day and night.	Field	LAeq	2880	2880		AnJi Guoyuan Water Group Co., Ltd.	
Perfection Project of Water Supply and Drainage Facilities in Banshan Area	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Construction Point	TSP	1095	8375	Environment Monitoring Institution	AnJi Guoyuan Water Group Co., Ltd.	AnJi County Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
		Surface Water	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Dipu Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	Field of Banshan Water Plant: 1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of Banshan Water Plant	LAeq	720	7120			
		Atmosphere	1 time/year (summer), 2 days/time and 4 times for each day.	Field of Banshan Water Plant and Dahouwu Village	Cl2	3600				
		Surface Water	Monitoring is done once in January and July of each year. Sampling is done once at the first ten days of a month in each phase.	Fushi Reservoir	Water temperature, pH, TP, DO, CODMn, ammonia nitrogen, petroleum, volatile phenol, fluoride and Fecal escherichia coli index.	2800				
Expansion Project of AnJi Urban Sewage Disposal Plant	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Nearby residential areas	TSP	1095	8375	Environment Monitoring Institution	AnJi Guoyuan Water Group Co., Ltd. or Contractor	AnJi County Environmental Protection Bureau
		Noise	During the construction peak period, it shall be done with 1 time/month, and frequency of 1 day/time; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residence	LAeq	2160				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Huxi Stream	CODcr, NH3-N, SS, pH, Petroleum	5120				
	Operating Period	Noise	1 time/year, and 1 day/time. 1 time separately at the day and night.	Field of AnJi Sewage Disposal Plant	LAeq	1440	13760		AnJi Guoyuan Water Group Co., Ltd.	
		Atmosphere	1 time/year (summer), 2 days/time and 4 times for each day.	Yingjiatan Village, Hehuatang Village and Gaoqiao	H2S and NH3	7200				
		Surface Water	1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day. 2 sections are set at the upstream and downstream of the discharge outlet.	Huxi Stream	CODMn, BOD5, ammonia nitrogen, total phosphorus and petroleum	5120				
Trial Project of Scattered Rural Domestic Sewage Treatment System of AnJi County	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Construction Point	TSP	1095	8375	Environment Monitoring Institution	AnJi Guoyuan Water Group Co., Ltd. or Contractor	AnJi County Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Tiaoxi Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
	Operating Period	Noise	One natural village is selected in each township for monitoring with 1 time/year, 1 day/time and 1 time separately at the day and night.	Field	LAeq	3960	13448		AnJi Guoyuan Water Group Co., Ltd.	
		Atmosphere	One natural village is selected in each township for monitoring with 1 time/year (summer) and 2 days/time; it shall be at 8:00, 11:00, 13:00 and 16:00 of each day.	Field	H2S and NH3	2400				
		Surface Water	One natural village is selected in each township for monitoring with 1 time/year (dry season), 2 days/time and 1 time separately in the morning and afternoon of each day. Two sections of upstream and downstream are set.	Surface water body near sewage treatment facilities	CODMn, BOD5, ammonia nitrogen, total phosphorus and petroleum	5120				
		Ground Water	One natural village is selected in each county (city) for monitoring with 3 times/year (wet season, normal river flow season and dry season), 2 days/time and 1 time separately in the morning and afternoon of each day.	Monitoring well	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				
Tiantai Area										
Improvement project of water supply	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Construction Point	TSP	1095	8375	Environment Monitoring Instituti	Tiantai Water Supply Company or	Tiantai County Environmental Protection

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
and drainage system for cities and villages in the north central district of Tiantai Basin		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160		on	Contractor	Bureau
		Surface Water	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Shifeng Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
Improvement project of water supply and drainage system for villages in eastern district of Tiantai Basin	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Construction Point	TSP	1095	8375	Environment Monitoring Institution	Tiantai Water Supply Company or Contractor	Tiantai County Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				
		Surface Water	During the construction period, it shall be done with 1 time/season and 2 days for each time separately in the morning and afternoon for once.	Shifeng Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	1 sewage lift pump station: 1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of pump station	LAeq	720	720		Tiantai Water Supply Company	

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
Improvement project of water supply and drainage system for villages in eastern district of Tiantai Basin	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Nearby residential areas	TSP	1095	8375	Environment Monitoring Institution	Tiantai Water Supply Company or Contractor	Tiantai County Environmental Protection Bureau
		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160				
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time, with separately monitoring in the morning and afternoon for once.	Cangshandao Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	1 time/year, and 1 day/time. 1 time separately at the day and night.	Field of Cangshan Sewage Disposal Plant	LAeq	1440	9920		Tiantai Water Supply Company	
		Atmosphere	1 time/year (summer), 2 days/time and 4 times for each day.	Yushan Village, Shishan Village and Xiali Village	H2S and NH3	7200				
		Surface Water	1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day. 2 sections are set at the upstream and downstream of the discharge outlet.	Cangshandao Stream	CODcr, BOD5, NH3-N, TP	1280				
Improvement project of water supply	Construction Period	Atmosphere	During the construction period, one natural village can be selected for monitoring with 1 time/year, or each natural village is randomly selected for monitoring with 3 days/time.	Nearby residential areas	TSP	1095	8375	Environment Monitoring Instituti	Tiantai Water Supply Company or	Tiantai County Environmental Protection

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
and drainage system for decentralized villages in Tiantai Basin		Noise	One natural village can be selected for monitoring with 1 time/month and the frequency of 1 day/time during the construction period; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Nearby residential areas	LAeq	2160		on	Contractor	Bureau
		Water Body	During the construction period, it shall be done with 1 time/season and 2 days for each time, with separately monitoring in the morning and afternoon for once.	Cangshandao Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	One natural village is selected in each township for monitoring with 1 time/year, 1 day/time and 1 time separately at the day and night.	Field of Sewage Disposal Station	LAeq	4680	92664		Tiantai Water Supply Company	
		Atmosphere	One natural village is selected in each township for monitoring with 1 time/year (summer) and 2 days/time; it shall be at 8:00, 11:00, 13:00 and 16:00 of each day.	Field of Sewage Disposal Station	H2S and NH3	31200				
		Surface Water	One natural village is selected in each township for monitoring with 1 time/year (dry season), 2 days/time and 1 time separately in the morning and afternoon of each day. Two sections of upstream and downstream are set.	Surface water body near sewage treatment facilities	CODcr, BOD5, NH3-N, TP	31200				
		Ground Water	One natural village is selected in each township for monitoring with 1 time/year (dry season), 2 days/time and 1 time separately in the morning and afternoon of each day.	Monitoring well	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	25584				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
Longquan Area										
Perfection Project of Water Supply and Drainage Facilities for Urban Areas in Longquan	Construction Period	Atmosphere	At the construction point of Nandayang Water Plant, the municipal pipe network project is randomly selected for monitoring with 3 days/time and sampling time not less than 12h each day; the monitoring time is 1 time/year.	Construction Point	TSP	2190	18190	Environment Monitoring Institution	Longquan Water Supply and Discharge Co., Ltd. or Contractor	Longquan Environmental Protection Bureau
		Noise	The field of Nandayang Water Plant and places along the municipal pipe network project shall be monitored with 1 time/month, with the frequency of 1 day/time, and 1 time separately at the day and night in case of any night construction.	Construction Area	LAeq	5760				
		Water Body	One point location is separately set at the upstream and downstream of Longquan Stream for monitoring with 1 time/season, 2 days/time and 1 time separately in the morning and afternoon of each day during the construction period.	Longquan Stream	CODcr, NH3-N, SS, pH, Petroleum	10240				
	Operating Period	Surface Water	Longquan Stream is monitored with 1 time/season (dry season), 2 days/time and 1 time separately in the morning and afternoon of each day. 2 sections are set at the upstream and downstream of the discharge outlet.	Longquan Stream	CODcr, BOD5, NH3-N, TP	2400	4368		Longquan Water Supply and Discharge Co., Ltd.	
		Ground Water	The nearby area of Nandayang Water Plant is monitored with 1 time/season, 2 days/time and 1 time separately in the morning and afternoon of each day.	Wells of natural villages	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
Water Supply and Drainage Project of Anren Town, Longquan City	Construction Period	Atmosphere	It is monitored with 1 time/year and the frequency of 3 days/time during the construction period.	Construction point in water supply plant and sewage plant	TSP	2190	13070	Environmental Monitoring Agency	Longquan Township Water Supply Station or Contractor	Longquan Environmental Protection Bureau
		Noise	During the construction period, it shall be done with 1 time/month, and frequency of 1 day/time; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Field of water supply plant, sewage plant, Huangshixuan Village and Xiangbian Village	LAeq	5760				
		Water Body	Monitoring is done at the frequency of 1 time/season, 2 days/time and once in each morning and afternoon during the construction period.	Anren Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	Conducting at the frequency of 1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of Anren Sewage Plant and Anren Water Plant	LAeq	2880	16848		Longquan Township Water Supply Station	
		Atmosphere	It is done with 1 time/year (summer) with the frequency of 7 days/time; the concentration value at 4h of 02, 08, 14 and 20 in each day shall be gained.	Field of AnJi Sewage Disposal Plant	H2S and NH3	9600				
		Surface Water	It is done with 1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day. Two sections of upstream and downstream are set.	Anren Stream	CODcr, BOD5, NH3-N, TP	2400				
		Ground Water	It is done with 1 time/year (wet season, normal river flow season and dry season), 2 days/time and 1 time separately in the morning and afternoon of each day.	Monitoring well of Huangshixuan Village	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
Water Supply and Drainage Project of Badu Town, Longquan City	Construction Period	Atmosphere	It is monitored with 1 time/year and frequency of 3 days/time during the construction period.	Construction point in water supply plant and sewage plant	TSP	2190	13070	Environmental Monitoring Agency	Longquan Township Water Supply Station or Contractor	Longquan Environmental Protection Bureau
		Noise	During the construction period, it shall be done with 1 time/month, and frequency of 1 day/time; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Field of Jintian Village and Badu Sicun	LAeq	5760				
		Water Body	Monitoring is done at the frequency of 1 time/season, 2 days/time and once in each morning and afternoon during the construction period.	Badu Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	Conducting at the frequency of 1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of Badu Sewage Plant	LAeq	1440	15408		Longquan Township Water Supply Station	
		Atmosphere	It is done with 1 time/year (summer) and frequency of 2 days/time; the concentration value at 4h of 02, 08, 14 and 20 in each day shall be gained.	Field of Badu Sewage Plant	H2S and NH3	9600				
		Surface Water	It is done with 1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day. Two sections of upstream and downstream are set.	Badu Stream	CODcr, BOD5, NH3-N, TP	2400				
		Ground Water	It is done with 1 time/year (wet season, normal river flow season and dry season), 2 days/time and 1 time separately in the morning and afternoon of each day.	Monitoring well of Badu Sicun	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
The First Batch of Sewage Disposal Project in Decentralized Villages in Longquan	Construction Period	Atmosphere	It is monitored with 1 time/year and the frequency of 3 days/time during the construction period.	Construction points in Xiaomei Water Plant, Xiaomei Sewage Plant and scattered villages	TSP	3285	19205	Environmental Monitoring Agency	Longquan Township Water Supply Station or Contractor	Longquan Environmental Protection Bureau
		Noise	During the construction period, it shall be done with 1 time/month, and frequency of 1 day/time; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Field of 5 village construction points is selected.	LAeq	10800				
		Water Body	Monitoring is done at the frequency of 1 time/season, 2 days/time and once in each morning and afternoon during the construction period.	Xiaomei Stream	CODCr, NH3-N, pH, SS, Petroleum	5120				
	Operating Period	Noise	Conducting at the frequency of 1 time/year, 1 day/time, and 1 time separately at the day and night.	Field of Xiaomei Water Plant and Xiaomei Sewage Plant	LAeq	2880	16848		Longquan Township Water Supply Station	
		Atmosphere	It is done with 1 time/year (summer) and frequency of 2 days/time; the concentration value at 4h of 02, 08, 14 and 20 in each day shall be gained.	Field of Xiaomei Sewage Plant	H2S and NH3	9600				
		Surface Water	It is done with 1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day.	As for Xiaomei Stream, select two sections of upstream and downstream of discharge outlet.	CODcr, BOD5, NH3-N, TP	2400				
		Ground Water	It is done with 1 time/year, 2 days/time, and 1 time separately in the morning and afternoon of each day.	Monitoring well of Meisi Village	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	1968				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
The Second Batch of Sewage Disposal Project in Decentralized Villages in Longquan	Construction Period	Atmosphere	It is monitored with 1 time/year and frequency of 3 days/time during the construction period.	Construction points in Chatian Water Plant, Lanju Sewage Plant and 3 scattered villages	TSP	5475	37315	Environmental Monitoring Agency	Longquan Township Water Supply Station or Contractor	Longquan Environmental Protection Bureau
		Noise	During the construction period, it shall be done with 1 time/month, and frequency of 1 day/time; it shall be monitored for 1 time separately at the day and night in case of any night construction.	Field of 15 village construction points is selected.	LAeq	21600				
		Water Body	Monitoring is done with 1 time/season, 2 days/time and 1 sampling in each day during the construction period.	Xiaomei Stream and Yuzhang Stream	CODCr, NH3-N, pH, SS, Petroleum	10240				
	Operating Period	Noise	Conducting at the frequency of 1 time/year, 1 day/time, and 1 time separately at the day and night.	Chatian Water Plant, Chatian Sewage Plant field, Xiaomei Water Plant and Xiaomei Sewage Plant	LAeq	5760	33696		Longquan Township Water Supply Station	
		Atmosphere	It is done with 1 time/year (summer) and frequency of 2 days/time; the concentration value at 4h of 02, 08, 14 and 20 in each day shall be gained.	Field of Lanju Sewage Plant and Chatian Sewage Plant	H2S and NH3	19200				
		Surface Water	It is done with 1 time/year (dry season), 2 days/time, and 1 time separately in the morning and afternoon of each day.	Xiaomei Stream, Yuzhang Stream and two sections of upstream and downstream of discharge outlet.	CODcr, BOD5, NH3-N, TP	4800				

Subproject Name	Implementing Stage	Monitoring Content	Monitoring Time and Frequency	Monitoring Site	Monitoring Item	Cost Estimate (yuan)	Total Annual Expense (yuan)	Implementing Institution	Responsible Institution	Supervising Institution
		Ground Water	It is done with 1 time/year, 2 days/time, and 1 time separately in the morning and afternoon of each day.	Monitoring wells of Wumeiyang and Chasan Village	CODcr, BOD5, NH3-N, NO3-, NO2- and TP	3936				

7 Environmental Supervision Mechanism

Various work activities will bring certain effect on the natural ecological environment during the construction. To relieve the influence of construction on environment to the maximum, and reduce the occurrence of accidents, items such as enhancing environment management and implementing various environmental protection measures and safety measures shall be conducted. It is suggested to introduce the environmental supervision mechanism in this project. The attention and responsible level of supervisor on the environmental protection during construction is related to the implementation of environmental protection work during construction.

7.1 Purpose of Environmental Supervision

The purpose of implementing environmental supervision for the proposed project is to make the environmental supervision and management responsibility of the construction site clear and the objective explicit, which will run through the overall project implementation, thus ensuring that various environmental protection measures proposed in the environmental protection design and environmental impact report can be smoothly implemented, and ensuring that the contract terms related to environmental protection in the construction contract can be put into practice.

7.2 Task of Environmental Supervision

Tasks of environmental supervision during the project construction period include:

1. Management, namely the management on the collection, classification, processing, feedback and storage related to environmental supervision quality and information.

2. Coordination, namely the coordination and organization on the environmental protection between the building unit and Contractor, between the building unit and design unit, and among various departments of project construction.

7.3 Framework of Environmental Supervision

1. Establish and improve the perfect security and organizational system of environmental supervision.

The environmental supervision is dual nature, and it must be equipped with professional institution and professionals with higher professional quality regarding its relative independence. It is suggested that the qualified environmental supervision unit shall be entrusted to carry out the environmental supervision work, and accept the supervision of Zhejiang Provincial Environmental Protection Bureau and local environmental protection administration.

2. Formulate specific environmental protection management measures and implementations.

On the basis of executing the national environmental protection policy and regulations, relevant environmental protection systems aimed at this project are formulated combining the environmental monitoring and environmental supervision plan specified in the environmental impact assessment statement of this project.

3. Establish perfect environmental supervision work system.

① Job logging system, namely “Supervision Diary”. Describe the conditions of tour inspection, check and environmental problem and analyze the causes, responsible units and suggestions of preliminary treatment.

② Reporting system, including the “Monthly Report” of environmental supervising engineer, “Quarterly Report” and “Assessment Report on Six-Month Schedule” of engineer, and “Monthly Environmental Report” of Project Contractor.

③ File notification system; the relation of environmental supervising engineer and Project Contractor is only work-based, and matters to be handled between them are communicated and confirmed through file delivery. Verbal notification is allowed in advance in case of any emergency project, but written file delivery and confirmation must be conducted in the next day.

④ Regular meeting system for environment; one environmental protection meeting shall be convened monthly to review and summarize the environmental protection condition of one month. Project Contractor, engineer and environmental supervising engineer shall be called together to discuss and study, and propose the problems existed and rectification requirements, forming the implementation plan.

7.4 Requirements on Environmental Supervisors

It is very crucial of the self-quality of environmental supervisors in checking whether the environmental supervision plays the role of supervision, for this purpose, the following requirements are proposed for environmental supervisors:

1. With relevant environmental protection professional quality and relatively long environmental protection engaging experience.

2. Mastering the national environmental law, regulations and policies, and understanding the requirement and environmental standard of the local environmental protection administration.

3. Knowing well about the project EA report, and learning about the environmentally sensitive problems and corresponding measures of the project.

7.5 Duties of Environmental Supervisors

Environmental supervisors take charge of supervising the construction site, and the main duties include:

1. Review the environmental protection plan and relevant environmental cost of the construction bidding unit, ensure the implementation of “Environmental Management Plan” of the construction site.

2. Review the construction contract, and supervise the Owner to write the environmental content and relevant costs and punishment in the contract.

3. Timely report the construction environmental management status to relevant department and propose rational suggestions based on the discovered problems.

8 Ability Enhancement and Training

8.1 Training Purpose

Purpose of environmental management training is to ensure the smooth and efficient launching of environmental management work, make relevant staff familiar with the content and procedures of environmental management, improve the environmental management ability of environmental managers, and ensure the effective implementation of various environmental protection measures. The main objects of environmental ability building are environmental managers and environmental supervisors, whose training is one of the constituent part of technical support in the project, meanwhile, the training for the building unit and constructors shall be conducted during the project implementation. Prior to the commencement of project construction, all construction units and management units and Contractors shall take part in the environment, health and safety training.

8.2 Training Object

Provincial project offices and four county and city subproject offices shall assign special person to be responsible for the implementation of environmental management plan, and shall understand knowledge about environmental protection, being familiar with laws and regulations on environmental protection, security policies of World Bank and environmental management plan.

The training objects of environmental management during construction are: provincial project office, subproject offices of four counties and cities, the executing unit of various subprojects and other staff, environmental supervising engineer, representative of environmental monitoring institution, engineering technology director and professional managers of Contractors, etc.

The environmental management training objects during the operating period are mainly the operation and management personnel of various subprojects.

8.3 Training Content

Content of environmental management training during construction includes:

1. Regulations, files and relevant requirements on environmental protection, conservation of water and soil and other aspects in construction project management by the state and Zhejiang Province;
2. Requirements on project environmental management from the World Bank;
3. Environmental protection measures and environmental protection requirements during construction proposed in the design of this project;
4. Environmental protection guide during construction of this project;
5. Environmental management plan of this project (EMP) and Environmental Management Framework (EMF)
6. Duties and interrelation of environmental managers and environmental supervisors and Contractors.

Environmental protection design director of environmental protection agency and design unit, relevant experts of EIA unit and monitoring unit and environmental protection experts of the World Bank can be invited as the teachers of the training class.

Content of environmental management training during construction includes:

1. Regulations, files and relevant requirements on environmental protection in construction project management by the state and Zhejiang Province;

2. Relevant requirements on environmental protection acceptance of project completion and "Three Simultaneousness" management.

3. Operation and management on sewage disposal plant, water plant, pump station, pipe network, etc.

4. Operation and management on relevant environmental protection measures during the operation period.

Relevant environmental protection experts of universities, scientific research institutions and operation and management units can be engaged to give lessons or participate in the short-term training class.

8.4 Personnel Training Plan

The training plan for environmental personnel is shown in Table 8-1.

Table 8-1 Training Plan for Environmental Protection Personnel

Stage	Category	Number of Persons	Time	Cost (RMB Ten thousand Yuan)
Construction Period	Project Office Management Personnel	10 persons	Upon the determination of the Contractors, before construction	5.0
	The Building Unit of the Project	20 persons		10.0
	Contractors	40 persons		20.0
Operating Period	Management and Operation personnel	20 persons	Upon the completion of construction, Before the project operation	10.0
Total		90 persons		45.0

9 Public Representation Mechanism

9.1 Continuous Public Participation Plan

During the construction period and 3 years after operation, 1 time of random return visit and survey is conducted for environmentally sensitive target of each subproject semiannually; one public participation field survey is convened at the concentration area of environmentally sensitive target yearly.

The survey result is based to evaluate the satisfaction degree of the public, analyze the relevant advice, and improve the environmental mitigation measures when necessary.

9.2 Complaint and Appealing Channel

(1) Establishment and composition of organization

To better guarantee the lawful right of affected people, a sort of complaints scheme will be set up to provide a convenient, transparent, fair and effective complaint way for affected people; therefore, subproject offices of four counties and cities shall establish a complaint acceptance leading group of environmental influence, whose group leader can be held concurrently by related personnel of the subproject director, and its group members are from the subproject office, building unit, relevant county and city environmental protection agency, Contractor, environmental impact assessment unit, etc. A complaint acceptance office is set subordinate to the complaint acceptance leading group of environmental influence and set at the subproject offices of four counties and cities. It will collect, clear up and summarize the daily complaints.

Contractors of various subprojects shall set up specially-assigned person on the spot to take charge of recording the complaint and appealing of people received.

(2) Complaint and Appealing Procedures

The complaint acceptance leading group and office will start the complaint acceptance within 1 week after the commencement of works, open the complaints hot line and complaint mailbox, and publicize relevant complaint and appealing method at the construction site. The complaint procedures are shown below in details:

When the affected people consider that his right is infringed concerning any aspects of environmental protection, he may complain to the complaint acceptance office or directly to the Contractor in written form or oral form; the oral complaint will be recorded in detail and cleared up by the member of the complaint acceptance office or the Contractor, and the treatment suggestion will submitted within two weeks.

If the complainant dissatisfies the suggestion of the complaining Contractor or the acceptance office, he can complain to the environmental protection agency of relevant county and city in written form within 1 month after receiving the treatment suggestion, and the environmental protection agency of relevant county and city will give the treatment suggestion within the legal specified time.

If the complainant still dissatisfies the suggestion of the environmental protection agency of relevant county and city, he can complain to its superior competent department of environmental protection or Zhejiang Environmental Protection Bureau, or directly prosecute to the local people's court for trial and

adjudication based on The *Civil Procedure Law of the People's Republic of China* after receiving the treatment suggestion.

9.3 Replying Way of Complaint and Appealing

9.3.1 Reply Content to Complaint

1. Dissatisfied description of complainant;
2. Facts investigation result;
3. Treatment suggestion and specific basis;
4. The complainant has the right to complain to the upper-level department and civil court.

9.3.2 Way of Complaint Reply

The way of written materials directly sent to the complainant is adopted for reply, and the reply will be reported to the project office of Zhejiang province.

10 Information Exchange, Summarizing and Reporting

10.1 Information Communication

Necessary information exchange shall be conducted among different departments and posts in the organization regarding environmental management requirements, meanwhile, the organization shall report relevant information to the external (interested party, the public, etc.).

The internal information exchange can be conducted in the form of meeting, internal brief report and other ways, however, one formal meeting must be convened monthly, and all exchange information shall be recorded and filed.

The external information exchange shall be conducted once semiannually or yearly, and the information exchange with the coordinating unit shall be formed into summary and filed.

10.2 Record

For effective operation of the environment management system, the organization must establish a perfect recording system, and keep records of the following aspects:

(1) Any legal and regulatory requirements;

(2) Permits;

(3) Environmental factor and relevant environmental implication;

(4) Training;

(5) Inspection, checking and maintenance activity;

(6) Monitoring data;

(7) Inconformity;

(8) Effectiveness of corrective and preventive measures;

(9) Information of related party;

(10) Examining and verifying;

(11) Review.

Additionally, necessary control on the above various records must be done, including the identification, collection, catalogue, filing, storage, management, maintenance, inquiring, storage life, disposal and other links of records.

10.3 Reporting

Contractors, monitoring unit and building unit and project office shall record the project progress condition, the execution state of environmental management plan (EMP), environmental quality monitoring result, and timely report it to relevant department. It mainly contains the following 3 parts of content:

① The monitoring unit and Contractors make a detailed record for the execution state of EMP, and timely report it to the project office;

② The project progress report (such as monthly report, quarterly report and annual report) prepared by the project office must include the content of EMP progress, such as the execution progress and effect of EMP.

③ The project office shall provide EMP executive report to World Bank semiannually, and the annual EMP executive report of the project must be completed before March 31 of the next year and submitted to the World Bank.

EMP executive report shall include the following contents:

① The implementation conditions of the training plan;

② The status of project progress;

③ Whether there are public complaints or not, if there is complaint, the relevant main content, solutions and public satisfaction shall be recorded;

④ EMP executive plan of the next year.

11 Environmental Impact Assessment Framework of Scattered Rural Sewage Treatment Project

11.1 Overview

The project covers AnJi country in Zhebei mountain area, Fuyan City in Hangzhou Jianxian County, Tiantai County in Taizhou City and Longquan City in Lishui City, and includes 30 subprojects, namely 28 constructive subprojects in four counties and cities and 2 organization-strengthen subprojects proposed by provincial project offices.

The Project is implemented in two stages: the first stage includes 16 subprojects in four counties (cities), namely the short list projects in the Report; the second stage is framework project.

At present, town sewage treatment project and the first-batch distributed rural in the four regional subprojects have finished environmental evaluation, and other distributed processing villages will be identified and selected in the following construction. The present environmental evaluation doesn't cover the villages to be identified in the future. In order to provide convenience for the following-identified villages to develop environment impact evaluation, environment evaluation framework is put forward as the basis thereof.

11.2 Project Scope, Composition and Progress

The scope of this subproject is the rural scattered domestic sewage treatment project outside of the first batch of four counties and city of AnJi County, Fuyang, Tiantai County and Longquan City involved in Zhejiang rural sewage treatment project.

This project is composed of sewage jointing door, digestion tank remolding, sewage collection pipeline and sewage centralized processing facilities.

The implementation period of the project is six years.

11.3 Environmental Background, Evaluation Basis and Institution of the Project Area

Environmental background of the project area can be monitored by using the regional environmental monitoring data or entrusting the monitoring unit, and the impact prediction result of scattered rural sewage treatment project can be referred to for the main environmental influence.

The evaluation basis is mainly the national laws and regulations, environmental impact assessment technique guide and the security policy of the World Bank.

The evaluation institution can select the consulting unit with environmental impact assessment qualification and environmental impact assessment experience of World Bank project to bear.

11.4 Evaluation Arrangement and Examination Arrangement

This project is overall supervised by Zhejiang project office, and the subproject offices of AnJi County, Fuyang, Tiantai County and Longquan City will organize to evaluate the environmental influence for domestic sewage treatment project of the rest villages of the scattered rural sewage treatment

subprojects in their respective county and city.

Select according to the security policy system (*Environmental Evaluation*) (OP, BP and GP4.01) of the World Bank, *Culture Heritage Protection* (OP4.11), *Natural Habitat* (OP/B 4.04), *Dam Security* (OP/BP 4.37), choose under the arrangement of various subproject offices and under the guidance of provincial project offices, and evaluate according to the security policy touched. In the process of project selection, areas with significant environmental impact and environmental sensitive areas (such as natural heritage area) shall be avoided to ensure that the environmental impact category can reach Class B.

Environment impact list is formulated for daily treatment below 50,000t in centralized processing of domestic sewage based on List of *Classification Management on Environmental Impact Assessment of Construction Project* (Order No. 2 of Ministry of Environmental Protection) issued by the Ministry of Environmental Protection in 2008.

The environmental impact report is reviewed and examined by the environmental expert of the World Bank. According to the limits for examining and approving authority of the national environmental impact assessment, the environmental impact report of this subproject shall be approved by the project subordinate county (city) environmental protection agency.

Based on the stipulation in the Law of t*he People's Republic of China on Environmental Impact Assessment*, the EIA system must be executed for all newly-built, expanded and reconstruction projects; all construction projects with influence on the environment must be carried out according to law by performing the ("Three Simultaneousness") system of simultaneous design, simultaneous construction and simultaneous operation of environmental protection facilities and main works.

11.5 Task Procedures for Environmental impact Assessment

(1) After the village selection is finished, the selection result shall be submitted to the experts of the World Bank for approval.

(2) The environmental impact report is prepared and meets the requirement of environmental impact assessment framework.

(3) The environmental impact report is reviewed and examined by the experts of the World Bank.

(4) The environmental impact report on AnJi County scattered rural sewage treatment project is approved by AnJi County Environmental Protection Agency; the environmental impact report on Fuyang scattered rural sewage treatment project is approved by Fuyang Municipal Environmental Protection Bureau; the environmental impact report on Tiantai County scattered rural sewage treatment project is approved by Tiantai County Environmental Protection Agency; the environmental impact report on Longquan City scattered rural sewage treatment project is approved by Longquan Municipal Environmental Protection Bureau.

(5) The environmental impact report is submitted to the World Bank.

(6) The environmental evaluation report is started to execute.

11.6 Framework of the Executive Drainage Water Quality

Based on the report of Zhejiang Provincial Environmental Protection Bureau reported by the World Bank project team and Zhejiang project office, framework of the executive drainage water quality is as follows:

1. Rural sewage treatment system construction adopts the treatment process of simple process and convenient operation and maintenance.

2. For the villages out of the water source protection area, the rural domestic sewage shall be discharged through proper process treatment. The following limiting value requirements of pollutant shall be met: CODCr≤100mg/1, BOD5≤30mg/1, TN≤25mg/1 and SS≤30mg/1. When the villages are located near the functional areas of Class III surface water, the outlet water can't discharged directed to the nearby functional water body, but shall be discharged into the local rural ponds, channels and farmland system to form water cycle.

3. The domestic sewage in the water source protection area shall not be discharged after treatment, but shall be treated and diffused through land percolation treatment system.

① The water quality, before entering land percolation treatment system, shall be treated and meet the following pollutant index limit: CODCr ≤ 100mg/L, BOD5 ≤ 30mg/L, NH3-N ≤ 25mg/L, SS ≤ 30mg/L

② Land percolation treatment system shall be designed by selecting proper hydraulic loading and area loading according to the nature of soil. The distance between the border of percolation treatment system and the earth surface water shall be over 50m; the pipeline set of land percolation system shall exceed 1m over the ground water level. If the ground water depth is less than 1m, soil piling methods shall be adopted to make the pipeline set exceed 1m over ground water level.

③ Land percolation treatment system shall monitor the treatment effects. After the finishing of sewage treatment facilities in various water source protection areas, well shall be dug in the place of 10m on the upstream of land percolation treatment field and 50m on the downstream of the percolation treatment system border, in order to monitor the ground water quality. The ground water quality of monitoring well shall meet the Class III standard of *Quality Standard for Ground Water* (GB14848-93). If the background value of original ground water can't meet the Class III standard, the ground water quality at the downstream of the land percolation treatment field shall not exceed the background value of ground water quality at the upstream of monitoring well.

4. Rural domestic sewage water used for farmland irrigation and fishery industry shall meet the regulations in *Standard for Irrigation Water Quality (*GB5084-2005*)* and Water Quality Standard for Fisheries (GB11607-89). The recycling water used for ornamental sight water (riverway) shall meet the requirement regulated in the current national standard: The *Reuse of Urban Recycling Water-Water Quality Standard for Scenic Environment Use* (GB/T18921-2002).

11.7 Framework of Environmental Protection Measures

11.7.1 Environmental protection measures in the design stage

During the project design stage, the environment impact factors shall be fully considered, and the site selection of sewage treatment facilities shall avoid the sensitive areas of the project area, such as the

natural conservation area, geological disaster area and the habitat with ecological sensitivity, good vegetation area, basic farmland preservation area, etc.; culture relic protection sites, etc. shall be avoided for the site selection of sewage treatment facilities and pipe network project; the flood basin shall be also avoided for the site selection of sewage treatment facilities.

11.7.2 Environmental protection measures in the construction stage

Specify the environmental protection objectives of each project section in the bidding document, make the document cover EMP and ECOPs which will also contained in the construction contract, and specify the protective responsibilities and obligations that the contractor should bear.

Refer to the mitigation measures on environmental influence mentioned in the environmental protection procedures during construction for details.

11.7.3 Environmental protection measures in the operation stage

Considering that few sludge quantity is produced by sewage treatment facilities of various villages, and it is hard to conduct effective dehydration, so no dehydration is basically the main form; meanwhile, the industrial wastewater of villages involved in this project is little, it basically won't cause the condition of heavy metal exceeding the standard in sludge, therefore, it is suggested that sludge shall be properly used for agriculture to solve the demand of rural organic fertilizer. Otherwise, fecal suction truck is applied at regular intervals to send it to the urban sewage disposal plant for treatment.

The rack dreg shall be timely cleared, done with sanitary landfill or burned together with household refuse.

The environmental protection/management framework is shown in Table 11-1 in details.

11.8 Information Disclosure and Public Negotiation

Information disclosure and public negotiation, being necessary and essential in the process of project preparation and implementation, will make the personnel influenced by the project and other invested party take part in the process of project design and implementation, contribute to the project and help to minimize the negative influence and maximize the project profit.

The information needed to be disclosed includes but not limited to: project design, project contents, and mitigation measures for influence and suggestions. In the stage of project design and implementation, the abovementioned information shall be renewed, and disclosed to invested party continuously. The disclosed methods adopted might include announcement pasting on the board of the village committee, or through newspaper or internet.

All the design and guarantee documents shall be disclosed on the public places which are easily arrived by the influenced group or other invested parties before starting negotiation. Such forms as small-scale forum, community or village committee meetings, etc.

Table 11-1 Environmental Protection/Management Plan Framework of Scattered Rural Domestic Sewage Treatment Project

Subproject	Type of Impacts	Influence Mitigation Measures	Executor	Supervisor
Rural Scattered Domestic Sewage Treatment Subproject	Atmospheric Environment	Dust suppression measures such as watering or covering the storage yard are adopted for the temporary stacking place, and covering the compartment with canvas and watering on the transport route with soil road are adopted for automobiles transporting crushed aggregates (keeping the sealed transportation).	Contractor and Building Unit	Relevant County (City) Environmental Protection Bureau
	Water Environment	Domestic sewage of constructors must be used for farm irrigation or mountain forest greening without random discharging after reaching the standard; muddy water produced by the construction site shall be precipitated at the sedimentation basin to discharge the liquid supernatant, and piled sludge shall be transported outside for landfill after drying; or it may be used as the padding of the project combining the road greening.		
	Disposal of Solid Waste	Sanitary landfill shall be done for construction waste; household refuse shall be timely transported to the place assigned by the sanitation department for disposal; engineering spoil shall be intensively piled at the waste disposal area in each construction point, ecological afforestation and flood control ditch building shall be timely done to reduce water and soil loss upon the completion of construction.		
		It is suggested that the sludge shall be agriculturally utilized to solve the problem of rural organic fertilizer or sent to the urban sewage disposal plant for disposal by fecal suction truck.	Operation and Maintenance Unit	
	Acoustic Environment	The construction work time shall be rationally arranged, and strong-noise construction shall be prohibited during the night; low-noise equipment and low-noise construction method shall be possibly used and advanced construction technology and low-noise equipment shall be adopted.	Contractor and Building Unit	
	Ecological Environment	The temporarily occupied land must be timely done with the original land utilization recovery or greening recovery.		
	Nature Conservation Area/Cultural Relic	Discriminate whether it is in the scope of natural conservation area and preservation of cultural relics, which shall be avoided.	Construction Unit	