World Bank Financed

Ningbo Municipal Solid Waste Minimization and Recycling Project

Environment Management Plan

November 2012

Ningbo Municipal Research & Design Institute of Environmental Protection
**Project Name**: Environment Management Plan for Ningbo Municipal Solid Waste Minimization and Recycling Project Financed by World Bank

**File Type**: Environment Management Plan

**Entrusting Party**: Ningbo Office of Domestic Waste Classification Management

**Preparer**: Ningbo Municipal Research & Design Institute of Environmental Protection

**President**: Zhang Bing

**Director**: Liu Zhong

**Chief Engineer of the Institute**: Zhao Yongcai

**Person Taking Charge of the Project**: Shang Weichun

**Cooperation Unit**: Shanghai Chemical Environment Monitoring Station

Ningbo Environment Monitoring Center

Ningbo Yonghuanyuan Environment Engineering Technology Co., Ltd.

Zhejiang Engineering Exploration Institute
<table>
<thead>
<tr>
<th>Name</th>
<th>Occupation</th>
<th>Title</th>
<th>Achieved Contents</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shang Weichun</td>
<td>Environmental Engineering</td>
<td>Senior Engineer</td>
<td>In charge (Chapters 1, 3, 5)</td>
<td></td>
</tr>
<tr>
<td>Zhou Jian</td>
<td>Environmental Protection</td>
<td>Engineer</td>
<td>Chapter 4</td>
<td></td>
</tr>
<tr>
<td>Wang Yan</td>
<td>Environmental Protection</td>
<td>Assistant Engineer</td>
<td>Chapter 2</td>
<td></td>
</tr>
<tr>
<td>Zheng Shiwen</td>
<td>Environmental Engineering</td>
<td>Engineer</td>
<td>The rest chapters</td>
<td></td>
</tr>
<tr>
<td>Wang Xianhai</td>
<td>Environmental Engineering</td>
<td>Engineer</td>
<td>Professional review</td>
<td></td>
</tr>
<tr>
<td>Tan Dapeng</td>
<td>Environmental Sciences</td>
<td>Professor-level Senior Engineer</td>
<td>Review</td>
<td></td>
</tr>
<tr>
<td>Zhao Yongcai</td>
<td>Environmental Protection</td>
<td>Professor-level Senior Engineer</td>
<td>Approval</td>
<td></td>
</tr>
</tbody>
</table>
# Table of Contents

1. Background and Purpose of Establishing Environment Management Plan ........2
   1.1 Project Background ........................................................................................................... 2
   1.2 Establishment Purpose, Action Program and Requirements ........................................... 3
       1.2.1 Purpose ....................................................................................................................... 3
       1.2.2 Action Program and Requirements ............................................................................ 3

2. Project Content .................................................................................................................... 5
   2.1 Project Objectives ............................................................................................................ 5
   2.2 Project Content ................................................................................................................ 5

3. Environmental Impact Factors and Enforced Standards ............................................... 6
   3.1 Environmental Impact Factors ........................................................................................ 6
   3.2 Enforced Standards ......................................................................................................... 7

4 Potential Environmental Effect and Summary of Environment management Measures ............. 10
   4.1 Potential Environmental Impact ...................................................................................... 10
       4.1.1 Construction Period .................................................................................................. 10
       4.1.2 Operation Period ...................................................................................................... 10
   4.2 Summary of Environment management Measures .......................................................... 11

5 Implementing Agencies ......................................................................................................... 14
   5.1 Setting of Environment Management Agencies ............................................................. 14
   5.2 Responsibilities and Staffing of Environment Management Institutions ..................... 17

6. Environment Monitoring Plan ............................................................................................. 21
   6.1 Environment Monitoring Purpose .................................................................................... 21
   6.2 Monitoring Implementation and Plan ................................................................................ 21
   6.3 Environment Monitoring Report ....................................................................................... 22
       6.3.1 Environment Monitoring Report in Construction Period .......................................... 22
       6.3.2 Environment Monitoring Report in Operation Period ............................................... 22

7 Personnel Training .............................................................................................................. 24
   7.1 Training-targeted Persons ............................................................................................... 24
   7.2 Training Contents ............................................................................................................. 24
   7.3 Training Program ............................................................................................................. 25


9. Information Exchange, Summarization and Report ........................................................... 30
   9.1 Information Exchange ...................................................................................................... 30
   9.2 Recording ....................................................................................................................... 30
9.3 Reporting ..................................................................................................................................... 30

10 Continual Public Participation Plan and Complaint Mechanism .......................... 32

10.1 Continual Public Participation Plan ....................................................................................... 32

10.2 Dispute Complaint Channel .................................................................................................. 32
   10.2.1 Establishment and Composition of Complaint Organization .................................. 32
   10.2.2 Complaint Procedures ................................................................................................... 32
   10.2.3 Complaint Feedback Mechanism ..................................................................................... 33
Preface

The Environment Management Plan for the Ningbo Municipal Solid Waste Minimization and Recycling Project Financed by World Bank is prepared with proper supplements and amendments according to the requirements of the World Bank based on the Environmental Impact Report of the project. This environment management plan, as a newly compiled text, includes relevant environmental protection measures taken to reduce the impact in the construction period and operation period on the environment, so as to provide operative guidelines and working framework for the environment management and environment monitoring during the construction period and the operation period, which mainly consist of:

1 Background and target of environment management plan (EMP) establishment;
2 Project contents;
3 Environmental impact factors and executive standards;
4 Potential environmental impact and mitigation measures;
5 Implementing agency;
6 Environment monitoring plan;
7 Personnel training;
8 Execution cost estimation of environment management plan;
9 Information exchange, summary and report;
10 Dispute complaint channel.
1. Background and Purpose of Establishing Environment Management Plan (EMP)

1.1 Project Background

Ningbo is a national historical and cultural city, the economic center of the southern wing of the Yangtze River delta, an important port city in southeast coast, and a city specifically designated in the state plan that has provincial economic management authority, and has jurisdiction over eight districts, three cities and two counties. In recent years, Ningbo regards the household waste treatment and integrated control of pollution as a project in the public interests and practical construction which aim to improve the environment, serve people’s livelihood and promote the people’s livelihood and strive to improve household waste treatment and the integrated control of pollution. The cooperation with the World Bank for Ningbo Municipal Solid Waste Minimization and Recycling Project means that Ningbo, by introducing the concept of recycling economy and learning from foreign advanced waste classification treatment experiences, makes waste classification at headstream and waste utilization, improve recycling system of renewable resources, establish innovative classification and recycling demonstration system of urban household wastes and make relevant supporting mechanism establishment in order to realize the sustainable development of classification and recycling of urban household wastes so as to make the urban household wastes harmless, reduced and recycled to a large extent.

Collection and recycling demonstration project of Ningbo urban household wastes has been listed into the alternative project plan of 2011-2013 fiscal year of national application of the World Bank loan. The World Bank provides a loan of 80 million US dollars for this project and Ningbo shall allocate the supporting funds according to 1:1 in principle, the planning period is expected to be 2020, including 2012-2017 when the construction plan of cooperation with the World Bank shall be implemented, and the project is planned to be made within the established area of Ningbo downtown.

This EMP is made based on engineering features and environment characteristics of the construction project according to regulations such as Environmental Protection Law of the People's Republic of China, Interim Regulations on Giving Punishments for Illegal Acts and Disciplinary Offences in Environmental Protection, Regulations on the Administration of Construction Project Environmental Protection, Law of the People’s
Republic of China on the Prevention and Control of Atmospheric Pollution, Law of the People’s Republic of China on Prevention and Control of Water Pollution, Law of the People’s Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes, Law of the People’s Republic of China on Prevention and Control of Pollution From Environmental Noise and security policies of the World Bank including OP4.01 Environment Assessment, Environmental, Health, and Safety General Guidelines, under the guidance by relevant guidelines and policies and with a aim to protect the environment and develop the economy. Its general principle is: to start from the headstream and terminal treatment and ensure all exhausted pollutants are well controlled. The management plan strives to highlight the project features and grasp the main environment issues, and insists on such requirements as “cleaner production”, “up to standard discharge ” and “total quantity control”, and makes detailed monitoring, supervision and control measures for the environment impacts during construction period, operation period and closure period in order to ensure minimization of the environment impacts. All specified environmental protection measures should be technologically reliable and economically reasonable to the maximum.

According to the features of the project upon environment pollution, this environment management plan focuses on the monitoring, supervising and mitigation of environment impacts of atmospheric environment, surface-water environment, noise and solid wastes etc.

1.2 Establishment Purpose, Action Program and Requirements

1.2.1 Purpose

EMP establishment aims to establish technologically feasible, financially sustainable and operational environment countermeasures for unavoidable environment impacts of the project and apply such countermeasures for project construction and operation in order to reduce the negative impact of the project on the society and environment as far as possible and dispose or relief the remaining environment problems with proper environment countermeasures.

1.2.2 Action Program and Requirements

With the joint effort of officers of the World Bank, international consultants,
environment assessment unit and Ningbo Environment Protection Bureau, the general environment management aim of the project construction period and operation period is to keep sustainable development of Ningbo’s society, economy and environment, maintain or improve Ningbo environment quality, reduce or compensate, minimize the negative impacts brought to the community and environment by the project construction.

Specific actions include:

1. Put forward and implement the environment management and environment monitoring plan;

2. Put forward and implement pollutant control strategy in order to mitigate the impact on the environment.

Specific requirements:

1. Check the monitoring results of the monitoring factors listed in the environment monitoring plan of construction period and operation period;

2. Implement all the environment mitigation measures set forth in the environment impact report according to specified procedures.
2. Project Content

2.1 Project Objectives

Through the project implementation, gradually establish a sound collection, sorted transportation and sorted disposal system of domestic waste, improve the recycling percentage of household wastes, improve the safety of terminal treatment of domestic waste and reduce landfill and combustion shares so as to realize waste reduction at the headstream and resource recycling of Ningbo domestic waste.

After project implementation, it is expected to reach the following general aims: Ningbo general management level of domestic waste shall come to the advanced domestically by 2017; sorted collection and recycling system will cover 50% of built area of Ningbo and resource recycling rate will be 6% by 2017; the practical effect of the sorted recycling will be generally improved and 75% of Ningbo built area will practice sorted collection, and resource recycling rate will be 10% by 2020.

2.2 Project Content

The collection and recycling demonstration project of Ningbo urban domestic waste is planned to be built and implemented in the six administrative districts of Ningbo downtown including Haishu, Jiangdong, Jiangbei, Zhenhai, Beilun and Yinzhou and built areas of planned Ningbo State High-tech Industry Development District, Ningbo Dongqian Lake Tourism Resort District, mainly consisting of sorted collection, transportation and treatment of domestic waste: including sorted discharge, collection, transfer transport equipments and devices of domestic waste and kitchen waste treatment equipments and separation equipments of residential area, enterprises and public institutions, public places and farmer’s markets; collection and transport of large pieces and electronic wastes: including discharge equipments of large pieces and electronic wastes and collection and transport vehicles of large pieces; advertising, training, education, encouragement and laws established in order to promote sorted collection and supporting measures for supporting researches.

This project consists of four sub-divisions of sorted discharge, separation and collection and transport of domestic waste, construction of kitchen waste treatment equipments, implementation ability enhancement and project management. The project makes a total investment of 1,326.49 million yuan, including 80 million US dollars of the World
Bank loans, which is RMB 506.70 million yuan. Construction contents of all subprojects are detailed as Table 2.2-1.

Table 2.2-1 Construction Contents of All Subprojects

<table>
<thead>
<tr>
<th>S/N</th>
<th>Subproject Name</th>
<th>Project Type</th>
<th>Subproject Content</th>
<th>Investment (ten thousand yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sorted discharge, separation and transport of domestic waste</td>
<td>Newly built</td>
<td>Sorted collection equipments; sorted transport equipments; sorted transfer station newly built in Jiangdong District (Jiangdong Transfer Station in short), with a coverage of 19,081m², and transfer scale of 610t/d (including kitchen wastes 210t/d, other wastes 400t/d); sorted transfer station newly built in Jiangbei District (including separating center) (Jiangbei Transfer Station (including separating center) in short), with a coverage of 16,734.2m² and transfer scale 790t/d (including kitchen wastes 190t/d, other wastes 600t/d), separation scale 150t/d; Yinzhou District sorted transfer station (Yinzhou transfer station in short) with a coverage of 24,616m², transfer scale 680t/d (including kitchen wastes 160t/d, other wastes 520t/d); sorted transfer station built at original site at Weihai Road, Zhenhai District (Weihai transfer station in short) with a coverage of 8,326m², transfer scale 460t/d (including kitchen wastes 150t/d, other wastes 310t/d); sorted transfer station newly built in Dongqian Lake (Dongqian Lake transfer station in short) with a coverage of 3587m², transfer scale 220t/d (including kitchen wastes 20t/d, other wastes 200t/d); transfer station newly built at Xujiacao, Haishu District (Haishu transfer station) with a coverage of 5032.6m², transfer scale 130t/d (kitchen wastes); Luotuo transfer station built at original site at Zhenhai District (Luotuo transfer station in short) with a coverage of 4877m², transfer scale 150t/d (other wastes); function transformation of 22 small transfer stations.</td>
<td>90750</td>
</tr>
<tr>
<td>2</td>
<td>Construction of kitchen waste treatment equipments</td>
<td>Newly built</td>
<td>One newly built Ningbo kitchen waste treatment plant (kitchen waste treatment plant in short), with a total scale of 800t/d, phase I 400t/d, and a coverage of 80 mu.</td>
<td>26151</td>
</tr>
<tr>
<td>3</td>
<td>Implementation ability enhancement</td>
<td>Newly built</td>
<td>Sorted management methods for domestic waste; supervision and assessment; sorted collection rewards/subsidiaries; sorted collection promotion; sorted collection training; supporting research; intelligent sanitation management information system.</td>
<td>14898</td>
</tr>
<tr>
<td>4</td>
<td>Project management</td>
<td>Newly built</td>
<td>Ability building of implementation agencies; achievement monitoring.</td>
<td>851</td>
</tr>
</tbody>
</table>

3. Environmental Impact Factors and Enforced Standards

3.1 Environmental Impact Factors

In light of pollution discharge features and characteristics of the environment with the
the environmental impact factors are identified as shown in Table 3.1-1.

Table 3.1-1 List of Environmental Impact Factors

<table>
<thead>
<tr>
<th>S/N</th>
<th>Time</th>
<th>Items</th>
<th>Primary Pollution Sources</th>
<th>Main Environmental Impact Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction</td>
<td>Ambient air</td>
<td>Raise dust</td>
<td>TSP</td>
</tr>
<tr>
<td>2</td>
<td>Surface water</td>
<td>Construction waste</td>
<td>Construction waste water and domestic sewage</td>
<td>SS, COD&lt;sub&gt;Cr&lt;/sub&gt;</td>
</tr>
<tr>
<td>3</td>
<td>Noise</td>
<td>Noise of construction machinery</td>
<td>Leq(dBA)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Soil wastes</td>
<td>Construction waste</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ambient air</td>
<td>Odors generated in the process of rubbish transferring, m sorting etc</td>
<td>H&lt;sub&gt;2&lt;/sub&gt;S, NH&lt;sub&gt;3&lt;/sub&gt; etc</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Surface water</td>
<td>Landfill leachate, production waste water and domestic sewage</td>
<td>COD&lt;sub&gt;Cr&lt;/sub&gt;, BOD&lt;sub&gt;3&lt;/sub&gt;, SS, ammonia nitrogen etc</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Noise</td>
<td>Noises of various fans in exhaust system and noise of driving of waste transporter</td>
<td>Leq(dBA)</td>
<td></td>
</tr>
</tbody>
</table>

3.2 Enforced Standards

In light of pollution discharge features and characteristics of the environment with the project, the environmental quality standards to be enforced are shown in Table 3.2-1, and the pollutant discharge standards to be enforced are seen in Table 3.2-2.

Table 3.2-1 Environmental Quality Standards

<table>
<thead>
<tr>
<th>S/N</th>
<th>Items</th>
<th>Standards Enforced</th>
<th>Class Enforced</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ambient air</td>
<td>Ambient Air Quality Standards(GB3095-2012)</td>
<td>Class two (in case that there is no standards for such items in GB3095-1996, carry out the standards for maximum allowable concentration of harmful substance in air in residential district stipulated in Hygienic Standards for the Design of Industrial Enterprises (TJ36-79))</td>
</tr>
<tr>
<td>2</td>
<td>Surface water</td>
<td>Environmental Quality Standards for Surface Water(GB3838-2002)</td>
<td>The Weihai Road Transfer Station and Luotuo Transfer Station carry out IV class, while Jiangdong Transfer Station, Haishu Transfer Station, Jiangbei Transfer Station (including sorting center), Yinzhou Transfer Station, Dongqian Lake Transfer Station and Kitchen Wastes disposal plant carry out III class.</td>
</tr>
<tr>
<td>3</td>
<td>Sea area accepting sewage</td>
<td>Sea Water Quality Standard(GB3097-1997)</td>
<td>Class III</td>
</tr>
<tr>
<td>4</td>
<td>Noise</td>
<td>Technical Report on</td>
<td>Jiangdong Transfer Station, Haishu Transfer</td>
</tr>
</tbody>
</table>
### Table 3.2-2 Pollutant Discharge Standards

<table>
<thead>
<tr>
<th>S/N</th>
<th>Items</th>
<th>Enforced Standards</th>
<th>Class Enforced</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Waste gas</td>
<td>Odors generated in rubbish (including rubbish in kitchen) transfer station and odors in Kitchen Wastes Disposal Plant</td>
<td>Emission Standard for Odor Pollutants <em>(GB14554-93)</em>&lt;sup&gt;1&lt;/sup&gt; Secondary standards for “air pollutants’ emission Limit of newly expanded and rebuilt pollution sources”</td>
</tr>
<tr>
<td>2</td>
<td>Noise</td>
<td></td>
<td>Emission Standard for Industrial Enterprises Noise at Boundary <em>(GB12348-2008)</em>&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>3</td>
<td>Solid wastes</td>
<td>Control Standards for Urban Wastes for Agricultural Use <em>(GB8172-87)</em></td>
<td>/</td>
</tr>
</tbody>
</table>

#### Project name and Whereabouts of sewage

<table>
<thead>
<tr>
<th>S/N</th>
<th>Project name</th>
<th>Whereabouts of sewage</th>
<th>Discharge standards carried for sewages in the project</th>
<th>Discharge standards carried by sewage treatment plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Weihailu Transfer Station</td>
<td>Zhenhai Houhaitang Sewage Treatment Plant</td>
<td>Standards for Sewage Water Quality Discharged into Municipal Sewers <em>(CJ343-2010)</em></td>
<td>Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant <em>(GB 18918-2002)</em></td>
</tr>
<tr>
<td>5</td>
<td>Luotuo Transfer Station</td>
<td>Ningbo North District Sewage Treatment Plant</td>
<td>Standards for Sewage Water Quality Discharged into Municipal Sewers <em>(CJ343-2010)</em></td>
<td>/</td>
</tr>
<tr>
<td></td>
<td>Station Name</td>
<td>Location</td>
<td>Class</td>
<td>Class B</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------</td>
<td>---------------------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>6</td>
<td>Jiangdong Transfer Station</td>
<td>Jiangdong North District</td>
<td>Class B</td>
<td>Class B</td>
</tr>
<tr>
<td></td>
<td>Sewage Treatment Plant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Haishu Transfer Station</td>
<td>Ningbo South District</td>
<td>Class A</td>
<td>B of Class A</td>
</tr>
<tr>
<td></td>
<td>Sewage Treatment Plant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Jiangbei Transfer Station</td>
<td>Ningbo North District</td>
<td>Class A</td>
<td>B of Class A</td>
</tr>
<tr>
<td></td>
<td>(including Sorting Center)</td>
<td>Sewage Treatment Plant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Yinzhou Transfer Station</td>
<td>Ningbo Southern WWTP</td>
<td>Class A</td>
<td>B of Class A</td>
</tr>
<tr>
<td>10</td>
<td>Dongqian Lake Transfer Station</td>
<td>Xinzhou WWTP</td>
<td>Class A</td>
<td>B of Class A</td>
</tr>
<tr>
<td>11</td>
<td>Kitchen Wastes Disposal Plant</td>
<td>Yinzhou Western WWTP</td>
<td>Class A</td>
<td>B of Class A</td>
</tr>
</tbody>
</table>
4 Potential Environmental Effect and Summary of Environment management Measures

4.1 Potential Environmental Impact

4.1.1 Construction Period

4.1.1.1 Ambient Air

The main air impact factors in construction period are dusts generated due to building materials transportation and loading and unloading.

4.1.2.2 Environmental Noise

The main environmental noise factors in construction period are random high-strength noise of construction machinery and traffic noise of construction vehicles.

4.1.1.3 Water Environment

The main water environmental impact factors are orderless discharge of muddy water in construction site, washing water for vehicles and domestic waste water of construction personnel.

4.1.1.4 Solid Waste Environment

The main impact factors on solid waste environment are impact of building wastes and domestic wastes made by construction personnel to surrounding environment.

4.1.1.5 Ecotope

The main factors that impact on ecotope in construction period are damages to natural ecotope such as original soils, plants etc in construction site and problems caused by above mentioned damage such as soil erosion.

4.1.2 Operation Period

4.1.2.1 Ambient Air
The main factor that impact ambient air in operation period are odors and dusts generated in the course of household waste transferring and sorting and tail gases exhausted by rubbish transport vehicles.

4.1.2.2 Surface Water Environment

The main factors that impact surface water environment in the operation period are effects made by landfill leachate, wastewater for washing ground, vehicles and domestic sewages discharged into water body accepting sewages.

4.1.2.3 Acoustic Environment

The main factors that impact acoustic environment in operation period are noise of mechanical equipments such as compactor, various fans and waste transporters to surrounding environment.

4.1.2.4 Solid Waste Environment

The main factors that impact solid wastes environment in operation period are domestic waste, used batteries etc dangerous wastes that impact the surrounding environment.

4.1.2.5 Ground Water Environment

The main factors that impact ground water environment in operation period are sewage leakage into ground then further contaminate the ground water caused by accidents such as damages and bursting of construction facilities such as waste water collecting pipelines, collecting tank for landfill leachates.

4.2 Summary of Environment management Measures

See what shown in Table 4.2-1 for environment management measures taken in the project.
## Table 4.2-1 Summary of Environment Management Measures and Estimates of Environmental Investments

<table>
<thead>
<tr>
<th>Time</th>
<th>Environmental elements</th>
<th>Descriptions of measures</th>
<th>Estimated environmental investments (ten thousand yuan)</th>
</tr>
</thead>
</table>
| Construction period | **Atmospheric environment** | 1) Give high priority to the use of commercial concrete and bulk cement; as to small amount of temporary and scattered mixing construction, the mixer shall be far from residential area, meanwhile, it shall set up baffle.  
2) The building materials are placed and stacked under classification according to the fixed places, if several bulk cements are needed, then they shall be stacked in the special temporary warehouse; particulate building materials which are stacked outdoors for long time such as sand and macadam etc., waterproof cloth should be used to cover them or frequently water to keep moist to reduce the raised dust; the pavement at the doorway for vehicles shall be hardened, and shall be cleaned and watered periodically to keep the pavement moist, thus reducing the raised dust on the road.  
3) It is suggested that loading and unloading operation be stopped of granular building materials such as sand, macadam etc. in case of adverse weather such as windy. | Seven vehicles of small watering carts: 17.5  
Rain-proof awning cloth 1400m²: 1.2 |
|               | **Water environment**    | 1) All wastes in the construction plant shall be stacked and timely cleared away according to the appointed place to avoid influencing the surface water body nearby or block the sewer because of storm runoff.  
2) In the construction plant, the whereabout of the drainage shall be strictly regulated, the drainage ditch and sedimentation basin shall be well designed in the early construction period for the civil muddy water and vehicle washing water etc. generated during the building construction, and the liquid supernatant of the muddy water and washing water for the building after sedimentation and separation is charged, while the sedimentary mud shall be periodically and timely transported outside. The domestic sewage shall rely on the surrounding domestic supporting facilities for treatment as far as possible. If unable to rely on them, the temporary septic-tank and oil separator must be set for the domestic sewage, and after pre-treatment it is then discharged into the municipal sewers, in the place where the pipe network is not connected, the local sanitation department shall be entrusted to pump periodically.  
3) When entering into construction site, construction vehicle shall slow down and mustn’t blow and it is suggested installing silencer on heavy vehicles such as loader.  
2) As to high-noise equipment that its position is relatively fixed such air compressor, it shall install it far from residential area and noise sensitive areas, and set sound insulating containment so as to reduce its effect to environment.  
3) Such low-noise construction methods shall be adopted, as hydraulic drilling, pouring pile head etc. to drive piles so as to reduce the effect of noise pollution from the heastream.  
4) It is prohibited from conducting high-noise construction in night. If it has to construct continuously overnight, it must obtain the approval of people’s government that is above the county level or other relevant authorities, and notice the surrounding residents who will probably be affected by such overnight construction. | It is 20% of total environmental investments, which is about 50,000 Yuan for temporary color steel sheet used for blocking devices. |
|               | **Acoustic environment** | 1) Conduct closed operation of waste in each collecting and transport system, separating system and set two channels of rapid rolling doors and exhaust equipment in workshop and operate in slightly negative pressure situation.  
2) Takes deodorization and dedusting measures for every collecting and transport system, separating system with a set of plant extracting solution spray +chemical washing at ends (totally 7 sets) and processed airflow is 20000m³/h~60000m³/h.  
3) The tail gas emission of newly purchased garbage collecting and transferring trunks shall meet national III and national IV emission standards. | 7 sets of drainage ditches and sedimentation basins: 10.5 |
|               | **Solid wastes**         | 1) Recover and make use of building rubbish as possible as it can and dispose the ones which can’t be used according to “Management Procedures of Building Rubbish in Ningbo”; entrust local sanitation departments to clean and transport the house refuse timely.  
2) The small amount of used oil in machinery maintenance shall be collected centrally then hand over to qualified unit as dangerous wastes for disposal. | / |
|               | **Ecotope**              | Strengthen and regulate the construction team management, strictly manage construction area, and recover original landform timely and make ecological compensation. | Site greening (24913m²)  
etc: 278.6 |
| Operation period | **Atmospheric environment** | 1) Give high priority to the selection of low-noise and environment friendly equipments and strengthen equipment maintenance.  
2) High-noise equipments such as air compressor and fan shall be set in independent equipment room (according to feasibility study protocol, arrange equipment room inside main station house) or equipped with noise enclosure to kill noise; and installed with vibration damping base so as to reduce noise pollution.  
3) Set silencers at the access points of various types of air compressor and fans.  
4) It shall adopt independent base for water pump and strengthen protective measures such as adding anti-vibration pad. It is suggested arranging it in underground.  
5) Equipments in waste processing plant such as other compressing, crushing, smashing etc shall be dealt with damping treatments. | 3.5Seepage-proofing and leakage control measures: 3.5 |
|               | **Water environment**    | 1) Every collecting and transport system, separating system shall be equipped with one complete set of waste water washing devices (totally 7 sets) and discharge the sewage after reaching standard due to pretreatment to municipal sewage pipe network.  
2) Rely on Yinzhou House Refuse Landfill Leachate Disposal center to disposal the leachates.  
3) Discharge the domestic sewage to municipal sewage pipe network after going through septic-tank. | 7 sets of waste water treatment systems: 495 |
|               | **Underground water environment** | Strength managements so as to avoid the running, emitting, dripping and leaking of pollutants from sources; try to adopt the principle of “visualization” for sewage pipeline laying and takes necessary anti-seepage measures and leakage prevention measures in respective areas. | 7 sets of plant extracts spray systems: 238  
7 sets of chemical washing towers: 1243  
66 sets of rapid rolling doors: 487 |
|               | **Acoustic environment** | 1) Bring the common solid wastes such as house refuse to local sanitation system to be disposed centrally.  
2) Entrust Beilun Environmental Friendly Solid Wastes Disposal Company and Ningbo Medical (special) | Silencer and damping bases etc.: 12 |
1) According to the relevant investigations and consultations, currently the operation of the equipment in relevant projects is basically normal and stable. It is suggested that all plants continue to keep strengthening the routing maintenances for various equipment to ensure the equipment normally operate, all kinds of pollutants are discharged stably reaching the standard for long time, as far as possible reduce the influences to the residents nearby; conduct periodical inspection, timely solve problems as they appear, in case with relevant economic strength or capacity, conduct further research, purchase and upgrade advanced equipment to further reduce the effluent concentration and discharge of the pollutants.
2) As to Fenglin Waste Incineration Power Plant, it is suggested that strengthen the routing management and maintenance to online monitoring system for waste incineration facilities and exhaust gas, and control and treat the odor source to ensure all kinds of pollutants are discharged under the long-term stability reaching the standard.
3) When it comes to Yinzhou District Domestic Waste Sanitary Landfill, it is suggested that well arrange exhaust gas dredging, collection and discharge system in the waste landfill to ensure odors are discharged reaching the standard.
4) With respect to the North Jiangdong WWTP, as the discharge outlet appears with coli group exceeding the standard through effluent test, it is suggested that the plant shall find out the reasons and implement necessary correction to ensure all kinds of indexes are discharged reaching the standard.
5) As to Houhaitang WWTP in Zhenhai, it is suggested that the plant be extended as soon as possible to ensure the normal connection of sewage and normal operation of the equipment, or other wastewaters be connected with other WWTP nearby for treatment.
6) With respect to South District Sewage Treatment Plant, the relevant departments have been actively developing the recycled water end users and building transport pipe network etc. to promote the usage degree of urban recycled water in Ningbo.
7) As to Ningbo Dadi Environmental Protection Co., Ltd., it is suggested that new tail gas treatment devices be introduced to reduce the discharge concentration of tail gas and reduce the influences to the surrounding residents to the greatest extent.
5 Implementing Agencies

In accordance with the relevant provisions and demand of actual engineering, in order to better realize the demonstration effects of the project, the environmental protection department will perform the regulatory responsibilities legally to the project, besides, it is planned to appoint special-assigned personnel in project management offices at various levels to take charge of environment management work, build the environment management system including supervisory bodies, implementing agencies and consultation service firms.

5.1 Setting of Environment Management Agencies

Please refer to Fig.5.1-1 for the organization chart of the project management agencies, and refer to Table 5.1-1 for the conditions of constituent agencies.

### Table 5.1-1 Constituent Agencies of Environment Management System

<table>
<thead>
<tr>
<th>Institution name</th>
<th>Task of institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work leading group in Ningbo City for classification treatment and recycle of household waste</td>
<td>Specifically take charge of the daily work of domestic waste classification and recycle, coordinate to promote the smooth implementation of various work of domestic waste classification and recycle, and refer to Table 5.2-1 for details.</td>
</tr>
<tr>
<td>World Bank Office for water environment</td>
<td>Take charge of contacting with the World Bank and operating the relevant business procedures in the World Bank, refer to Table 5.2-1 for details.</td>
</tr>
<tr>
<td>Administrative institution</td>
<td>Assign special environment managers to take charge of the environment protection work of the project at the stages of planning, design and implementation, ensure that the work procedures meet the requirements on environmental assessment and environment management in domestic country and World Bank, coordinating to supervise the implementation of environment management plans to ensure that the relevant contents of environment management plan are implemented in the bidding document and contract of contractor and supervisor. Refer to Table 5.2-1 for details.</td>
</tr>
<tr>
<td>Municipal Project Management Office</td>
<td>Take charge of the daily work of domestic waste classification and recycle, coordinate to handle the problems possibly appearing, refer to “5.2-1 Responsibilities and Staffing of all Institutions in Environmental Management System” for details.</td>
</tr>
<tr>
<td>Leading group at district level</td>
<td></td>
</tr>
<tr>
<td>Implementing organ</td>
<td>District subproject office and operation unit of Kitchen Waste Treatment Plant</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Supervising institution</td>
<td>World Bank</td>
</tr>
<tr>
<td>Municipal and District Environmental Protection Bureaus</td>
<td>Assign the special environmental personnel, and their main tasks are to take charge of the daily supervision and management during the construction period and operation period of the project, take charge of completion environmental protection acceptance and daily monitoring after the completion of the project to make the unfavorable influences on the environment by the project reduce to minimum or acceptable degree, at the same time make the environmental benefit of the project receive full play; implement all funds required for project environment protection work, and take charge of arranging and filing the relevant documents. Refer to Table 5.2-1 for details.</td>
</tr>
<tr>
<td>Implementing organ</td>
<td>Construction unit (contractor)</td>
</tr>
<tr>
<td>Consultation service institution</td>
<td>Environment consulting unit</td>
</tr>
<tr>
<td>Design consulting unit</td>
<td>Provide on-site environmental engineers to carry out the contents on environment protection and water and soil conservation specified in contract terms, tendering and bidding documents, satisfy the requirements of the World Bank, local administrative departments on environment protection, compile and submit the environment monthly during the construction period. Refer to Table 5.2-1 for details.</td>
</tr>
<tr>
<td>Environment supervising unit</td>
<td>Implement environment checking, consultation and technical support under the entrustment of project environment management institution, refer to “6.2 Responsibilities and Staffing of all Institutions in Environmental Management System” for details. Refer to Table 5.2-1 for details.</td>
</tr>
<tr>
<td>Engineering supervising unit</td>
<td>Compile feasibility study report and construction design schemes under the entrustment, and ensure that the measures and schemes in environment management plan are implemented in the compiled achievement. Refer to Table 5.2-1 for details.</td>
</tr>
<tr>
<td>Monitoring institution</td>
<td>Environment monitoring institution</td>
</tr>
<tr>
<td>Environment monitoring institution</td>
<td>As the qualified environment monitoring institution, take charge of environment monitoring work during the construction period and operation period of the project.</td>
</tr>
</tbody>
</table>

Ningbo Municipal Research & Design Institute of Environmental Protection

No.58, No. 48 Lane, Yimin Street, Ningboshi
Figure 5.1-1 Organization Chart of Project Management Agencies
5.2 Responsibilities and Staffing of Environment Management Institutions

The environment management system in the project includes project management institutions, supervisory bodies, implementing organs, consultation service institutions and monitoring institutions, and these institutions together constitute the complete project environment management system, but they respectively undertake different working contents and have different scopes of responsibilities. The project is launched under the organization and leading of municipal project office and governmental organization in all districts to ensure that the project construction meets the requirements of the relevant provisions in China and World Bank on working procedures and implementation of pollution prevention measures etc. The responsibilities and staffing in all institutions of the project are shown in the following Table 5.2-1.

<table>
<thead>
<tr>
<th>Institution name</th>
<th>Institution type</th>
<th>Staffing</th>
<th>Institution responsibilities</th>
</tr>
</thead>
</table>
| World Bank                                            | Supervisory institution           | 1 person | 1) The World Bank assigns inspection mission annually to take charge of conducting special inspection to the project implementation;  
2) Inspect the implementation conditions of the loan agreement for the project and implementation conditions of Environment Management Plan. |
| Environmental protection agencies at different levels | Supervisory institution           | 1 person | Conduct whole-process environment monitoring and supervision and management to the project, including approval for evaluation report of project environment influences (including the environment assessment work of subprojects), environment monitoring, supervision and management at the stages of project construction and operation etc. |
| Municipal leading group                                | Administrative organization       | 1 person | Specifically take charge of daily work for domestic waste classification and recycle, and coordinate to promote the smooth implementation of various work for domestic waste classification and recycle. |
| PMO for Water & Environment Project                   | Management organization           | 1 person | 1) Take charge of contacting with the World Bank;  
2) Operate relevant business procedures in World Bank |

Table 5.2-1 Responsibilities and Staffing of all Institutions in Environmental Management System
### Institution name | Institution type | Staffing | Institution responsibilities
--- | --- | --- | ---
Municipal Project Office | Management organization | 2 persons | 1) Supervise to implement *Environment Management Plan*, ensure that the corresponding environment management regulations are included in the bidding documents and construction contract of the project, and organize and coordinate the relevant trainings;  
2) Supervise, coordinate and implement domestic environmental management requirements and that in World Bank;  
3) Submit environment management plan implementation report semiannually;  
4) Inspect the environment management work in all districts;  
5) Coordinate to solve significant environment issues with other relevant departments;  
6) Entrust external environment experts to conduct inspection to the project.

District leading group | Administrative organization | 1 person respectively in relevant districts | Take charge of daily work for domestic waste classification and recycle, and coordinate to solve possibly generated problems
### Environment Management Plan for Collection and Recycling Demonstration Project of Ningbo Urban Life Wastes with World Bank Loan

<table>
<thead>
<tr>
<th>Institution name</th>
<th>Institution type</th>
<th>Staffing</th>
<th>Institution responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-PMOs in all districts and operation units of Kitchen Waste Treatment Plant</td>
<td>Administrative organization</td>
<td>2 persons respectively in all relevant districts and Kitchen Waste Treatment Plant</td>
<td>1) Take charge of the initial preparation of the project, organize to implement the construction, and take charge of construction quality and safety production supervision; 2) Take charge of daily environment supervision and management during the construction period and operation period of the project; 3) Take charge of completion acceptance after the project is built; 4) Supervise to implement the rules and regulations for environment management of subprojects; 5) Write the environmental protection measures in the environment management plan into the contract for project construction; 6) Invite, supervise and coordinate the construction supervision (qualification, responsibilities and management); 7) Organize to implement environment management training program; 8) Organize monographic study or relevant investigation work; 9) Well take notes on the complaint contents in the course of project construction and operation, and handle that, answer the treatment results to the public and solve the appealed problems by public; 10) Check the environment supervision and environment consultation reports; 11) Submit reports (statements) to municipal project office and district subproject office each quarter; 12) Sign to accept the field checklist reported by construction unit and supervisory unit, verify the sensitive problems for the environment, and conduct filing; 13) Receive environment work inspection (including project inspection of World Bank).</td>
</tr>
<tr>
<td>Environment consultation unit</td>
<td>Environment service institution</td>
<td>Several</td>
<td>1) Conduct field visits to all subprojects, and conduct assessment on the environment; 2) Take charge of compiling contents in Environment Management Plan and providing relevant consultation service.</td>
</tr>
<tr>
<td>Institution name</td>
<td>Institution type</td>
<td>Staffing</td>
<td>Institution responsibilities</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Construction supervisor (undertaking environment supervision work)</td>
<td>Consultation service institution</td>
<td>1-2 persons</td>
<td>1) Construction supervisor is separately entrusted by municipal project office or district subproject office; 2) Supervise and inspect domestic sewage treatment, industrial wastewater treatment, exhaust gas, dust and noise control measures, production, domestic waste and epidemic prevention in the construction area; 3) Periodically fill in various inspection lists in <em>Environment Supervision Report</em>; 4) Propose corrective solutions on the environmental protection issues met by the construction unit in the construction activities and follow up to implement, including issuing of rectification notice, rectification check sheet and inspecting document filing; 5) Submit project implementation conditions to the district subproject office each week.</td>
</tr>
<tr>
<td>Contractors</td>
<td>Implementing organ</td>
<td>Several</td>
<td>1) Formulate various environmental protection measures during the construction period; 2) Receive the supervision and inspection from construction supervisor, World Bank and environmental protection departments at various levels on environmental protection; 3) Set up a feedback system, after receiving the rectification notice, finish rectification within 3 workdays (in case of requiring administrative institution conducting coordination, finish rectification within 10 workdays); 4) Complete the construction site checklist together with the construction supervisor before construction to submit to the municipal project office and district subproject office; 5) The construction unit shall report the project implementation conditions to the construction supervisor each week.</td>
</tr>
<tr>
<td>Environment monitoring institution</td>
<td>Monitoring institution</td>
<td>Several</td>
<td>Conduct environment monitoring to the project according to <em>Environment Monitoring Plan</em> during the construction period and operation period of the project, conduct filing and report to all municipal project offices and district subproject offices.</td>
</tr>
</tbody>
</table>
6. Environment Monitoring Plan

6.1 Environment Monitoring Purpose

Environment monitoring is a key link and technical support in the environmental protection, and a necessary approach of environment management, the purpose of conducting environment monitoring lies in:

1) Inspecting the environmental issues existing in the construction period of the project such as protection to the bare ground, construction raise dust, construction wastewater etc. so as to dispose of them in a timely manner;
2) Inspecting and tracking the implementation and effect of environmental measures in the operation process after the project is put into production; mastering the changes of environmental quality;
3) Understanding the operation status of environment and engineering facilities of the project to ensure smooth operation of facilities;
4) Understanding the implementation of environmental quality monitoring related to the project;
5) Providing technical supports for improving the quality of the regional environment with the project.

6.2 Monitoring Implementation and Plan

According to the environmental impact prediction results, the sensitive points with relatively obvious pollution will be taken as the monitoring points. In accordance with the pollution in the construction period and operation period, surface water environment, underground water environment, soil environment etc which are greatly impacted are selected as the monitoring contents. The monitoring factors are determined on the basis of pollution characteristics in the engineering analysis. Monitoring and analysis methods adopted are those specified in the Environment Monitoring Technical Specifications issued by the Ministry of Environmental Protection. The assessment standards executed are those confirmed in this report. Monitoring agencies are the local environment monitoring stations or social environment monitoring agencies with monitoring qualifications. The responsible organization is the municipal PMO. The supervisory organs are environmental protection (sub-)bureaus in the districts. See Table 6.3-1 for the monitoring plan.
6.3 Environment Monitoring Report

6.3.1 Environment Monitoring Report in Construction Period

In the construction period, the Waste Classification and Recycle Project Office (Municipal PMO) of Ningbo City shall entrust the local monitoring station to conduct environment monitoring of the atmosphere, noise and nearby surface water bodies, and submit the report to local environmental protection agencies. The contents of report in this period should include project implementation progress, main construction contents and methods, comments on environmental impact and implementation of environmental impact mitigation measures. During the project construction, monthly report should be prepared every month and submitted to the project management division and Ningbo EPB.

6.3.2 Environment Monitoring Report in Operation Period

In project operations period, conduct environment monitoring to the operation of the project according to the requirements of environmental impact assessment, submit monitoring reports to the local environmental protection department in a timely manner. Contents of monitoring report mainly include:

1) Monitoring time, frequency, point location, monitoring items and methods;
2) Monitoring data and statistical analysis.
Table 6.3-1 Summary of Environment Monitoring Plan

<table>
<thead>
<tr>
<th>Periods</th>
<th>Environmental factors</th>
<th>Implementation units</th>
<th>Regulatory units</th>
<th>Environment Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction period</td>
<td>Atmospheric environment</td>
<td>Construction unit/contractors, Municipal project office, District Subproject Office</td>
<td>Ningbo Environmental Protection Bureau, Districts Environmental Protection Bureaus</td>
<td>Time and frequency: Separately conduct 1/yr monitoring, 2 days each time, the sampling time is no less than 12h everyday</td>
</tr>
<tr>
<td></td>
<td>Water environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acoustic environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation period</td>
<td>Atmospheric environment</td>
<td>Municipal project office, District Subproject Office, kitchen waste treatment plant operating units</td>
<td>Ningbo Environmental Protection Bureau, Districts Environmental Protection Bureaus</td>
<td>1/ quarter, 2 days/ time, 4 times/ day</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td></td>
<td></td>
<td>2 time/ yr, 1 day/ time, the daytime and nighttime once for each</td>
</tr>
<tr>
<td></td>
<td>Surface water environment</td>
<td></td>
<td></td>
<td>1/ quarter (2 days/ time, morning and afternoon once for each)</td>
</tr>
<tr>
<td></td>
<td>Soil environment</td>
<td></td>
<td></td>
<td>Monitor once in the fifth year of project implementation</td>
</tr>
</tbody>
</table>

Ningbo Municipal Research & Design Institute of Environmental Protection
No.58, No. 48 Lane, Yimin Street, Ningboshi
7 Personnel Training

Purpose of environment management training is to ensure that the environment management work is carried out smoothly and effectively, make relevant personnel be familiar with the contents and procedures of the environment management and ensure the effective implementation of environmental protection measures. The main objects of environmental capacity-building are environmental managers and environmental supervisors, of whom the training is one of the components of the project’s technical support. Construction side and workers are also trained by the training courses in the implementation process. Before the project construction starts, all units in charge of construction, operating units and construction supervisors are required to attend the mandatory environmental, health and safety training.

7.1 Training-targeted Persons

Training objects: All the staff of the Offices of Environment management at the levels of city and district, subproject owners, all the staff of the environmental supervision, representatives of environment monitoring agencies and main contractors, and others.

7.2 Training Contents

1) Mastery and application of World Bank’s environmental policies, domestic environmental laws and regulations, environmental standards;
2) Environment management mode of World Bank funded projects and environmental provisions in the Loan and Project Agreements;
3) Project environment management programs;
4) Project environment management provisions;
5) Responsibilities and inter-relationships of environment management people, environmental supervision personnel, environment monitoring personnel and contractors;
6) Preparation of environment management work report, the report on the work of environmental supervision, environment monitoring report, the contractor logs, monthly reports, interim reports, annual report as the technical documents of “Three meanwhile’s” acceptance inspection;
7) Basic knowledge of waste classification collection, work arrangement, collection and transportation arrangements, work records and data feedback, arrangements for volunteers’ day-to-day supervision.

### 7.3 Training Program

Environmental protection department is responsible for organizing and implementing the training of environmental protection full-time and part-time personnel newly added in the operation period. The related environmental protection experts in universities, scientific research institutions and operation and management units can be employed to give lessons, or participating in the short-term training class, as shown in Table 7.3-1.

**Table 7.3-1 List of Capacity Building and Training program**

<table>
<thead>
<tr>
<th>Name of Component</th>
<th>Training time</th>
<th>Training subject</th>
<th>Training object</th>
<th>Specific training contents</th>
<th>Times</th>
<th>Days/time</th>
<th>Number of people in each subproject</th>
<th>Budget (ten thousand yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1 (Municipal Solid Waste Separation, Collection, Sorting and Transportation) Component 2 (Kitchen Waste Treatment Facility)</td>
<td>Construction period</td>
<td>Environmental regulations and policies</td>
<td>Municipal project office, District sub project office, Construction unit, supervision unit</td>
<td>1) Environmental laws and regulations 2) Environmental policies and plans 3) Environment management of the World Bank</td>
<td>3</td>
<td>0.5</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Implement environment management plan</td>
<td>Environmental laws and regulations</td>
<td>Construction unit, supervision unit, District sub project office</td>
<td>1) Environmental protection responsibilities of the project construction period 2) Main task of environmental protection in the project construction period 3) Main contents of environmental protection in the project construction period 4) Various reports in the environment management plan</td>
<td>2</td>
<td>0.5</td>
<td>3</td>
<td>30.0</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Name of Component</th>
<th>Training time</th>
<th>Training subject</th>
<th>Training object</th>
<th>Specific training contents</th>
<th>Times</th>
<th>Days/time</th>
<th>Number of people in each subproject/</th>
<th>Budget (ten thousand yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5) Improvement and modification of environment management plan</td>
<td>1</td>
<td>0.5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6) Internal monitoring methods, data collection and disposal etc.</td>
<td>1</td>
<td>0.5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Emergency processing</td>
<td>District sub-project office, Construction unit</td>
<td>Emergency processing measure</td>
<td></td>
<td></td>
<td>1</td>
<td>0.5</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td>Construction period total (each year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32.0</td>
</tr>
<tr>
<td>Operation period</td>
<td>Environment monitoring inspection report</td>
<td>District sub-project office</td>
<td>Environment protection inspection, environmental quality monitoring, report preparation</td>
<td>4</td>
<td>1.0</td>
<td>2</td>
<td>15.0</td>
<td></td>
</tr>
<tr>
<td>Environmental protection facilities, environmental protection measures</td>
<td>District sub-project office</td>
<td>1) Environmental safety regulations and procedures</td>
<td>4</td>
<td>0.5</td>
<td>1</td>
<td>15.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Environmental protection facilities, environmental protection measures</td>
<td>District sub-project office</td>
<td>2) Emergency preplanning</td>
<td>4</td>
<td>0.5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation period total (each year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30.0</td>
</tr>
<tr>
<td>Total (each year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>62.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project name</th>
<th>Training time</th>
<th>Training method</th>
<th>Training contents</th>
<th>Participants</th>
<th>Training frequency</th>
<th>Budget (ten thousand yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 3 (Project Implementation Support)</td>
<td>2013～2017</td>
<td>Centralized training in levels, layers, districts and batches</td>
<td>□ Basic knowledge of waste classification collection, work arrangement, collection and transportation arrangements, work records and data</td>
<td>Relevant person in charge of the area, street, community, property companies, sanitation work management, residential cleaners, classification volunteers, classification supervisor, community residents, removing and</td>
<td>1 time/ yr for municipal level, 2 times/ yr for district level, 1 time/ yr for the street and community</td>
<td>397</td>
</tr>
<tr>
<td>Component 4</td>
<td>Each year</td>
<td>Training, seminar</td>
<td>Business learning, study, expert seminars</td>
<td>Municipal project office, district project office, in the country, foreign countries.</td>
<td>Training 2 times/yr, seminar 1 time/yr</td>
<td>330</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>------------------</td>
<td>------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Capacity Building and Project Management Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8 Cost Estimate of Implementation of Environment Management Plan

Relevant costs of environmental protection of the project include three parts:
1) Expenses counted in the engineering, including waste gas treatment engineering, landfill leachate treatment engineering etc;
2) Expenses of the Construction unit for implementing Provisions on the Construction Environment management and carrying out construction environmental protection measures;
3) Environment management costs, including environment monitoring, environment management agencies, environmental consulting, training and other expenses.

Related environmental protection costs included in the engineering costs are not listed in this plan repeatedly. The expenses incurred by the Contractor in its implementing the Provisions on the Construction Environment Management shall be counted into its total bid price, which are not listed in this plan either. The expenses listed in the plan are mainly environmental management expenses.

Environmental management expenses of the project mainly include: environment monitoring fees, environmental consulting fee, environmental training costs, environment management and institutional facilities costs. Environmental management expenses of the project have been listed in the total investment of the project. See Table 8.1-1 for the cost estimates of environmental management of the project.

Table 8.1-1 Summary of Cost Estimates for Environmental Management of the Project (Unit: ten thousand yuan/yr)

<table>
<thead>
<tr>
<th>Project name</th>
<th>Environment monitoring</th>
<th>Environment management training</th>
<th>Environmental consultat ion</th>
<th>Environment management and institutional facilities/ Day - to - day environment management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1</td>
<td>5</td>
<td>200</td>
<td>205</td>
<td>62</td>
</tr>
<tr>
<td>Component 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component 3</td>
<td></td>
<td></td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Component 4</td>
<td></td>
<td></td>
<td>330</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>200</td>
<td>205</td>
<td>472</td>
</tr>
</tbody>
</table>

The training costs of environment management, environmental consulting fees, and facilities expenses of management agencies / day-to-day environment management fees
listed in Table 8.1-1 have been counted into the total training fees, technical support fees and project management fees of the project respectively. The environmental management cost listed separately is 2.05 million yuan a year.
9. Information Exchange, Summarization and Report

9.1 Information Exchange

Environment management requires necessary information exchange among different sections, and different posts in the organization, at the same time the organization shall inform related information to the outside (relevant sides, the public etc). The internal information exchange can be conducted in the forms of meeting, internal brief report etc, and there should be one formal meeting each month, all the exchanged information shall be recorded and filed. The information exchange about environment management plan of the project shall be conducted once each half year or one year, and the information exchange with the cooperation unit shall be minuted down and filed.

9.2 Recording

The organization shall establish a complete record system for the effective operation of the environment management system, maintaining the records about the following aspects:
1) Legal and regulatory requirements;
2) Licenses;
3) Environmental factors and the related environmental impact;
4) Training;
5) Inspection, checking and maintenance activities;
6) Monitoring data;
7) Uncompliance; the effectiveness of corrective and preventive actions;
8) Information of relevant sides;
9) Approval;
10) Review.

In addition, the above mentioned records shall also be controlled, including record identity, collection, cataloguing, filing, storing, management, maintenance, inquiry, storage life, disposal etc.

9.3 Reporting

In the process of project implementation, the environmental monitoring unit should
record the project progress, management plan (EMP) implementation, environmental quality monitoring results, etc. and report timely to the relevant departments. It mainly includes the following three aspects:

1) The monitoring unit and the contractors should make detailed records of the implementation of EMP, and report promptly to PMO;

2) The project progress report (such as monthly, quarterly, and annual report, etc) prepared by the project management office should include the contents of EMP progress, such as the implementation progress, implementation effect, etc. of EMP;

3) The implementation report of district-level environmental management plan should be annually submitted to the municipal project management office before March 10. The report consists of two parts, namely the implementation summary report of environmental management plan and 2 professional monitoring reports namely the groundwater monitoring report (once for every 2 years) and the environmental quality monitoring report;

4) The municipal project management office should prepare the annual EMP implementation report of the project should be prepared and submitted to the World Bank by the submission deadline required by the World Bank.

EMP implementation report should include but not limited to the following contents:

1) The project progress status, such as subproject civil construction progress, equipment supply and installation progress, etc;

2) The implementation of EMP plan;

3) The implementation of training program;

4) Whether there is public complaint, in case of complaint, the main content, solution and public satisfaction degree of complaint should be recorded;

5) The next year EMP implementation plan.
10 Continual Public Participation Plan and Complaint Mechanism

10.1 Continual Public Participation Plan

1. In the construction period and three years after the operation, a random return visit investigation on various environment sensitive targets should be conducted quarterly, and a public participation investigation meeting should be held annually in the area where environment sensitive targets are relatively concentrated.

2. Based on the results of quarterly investigation and annual investigation, the public satisfaction degree should be evaluated and relevant opinions should be analyzed, when necessary, the environmental mitigation measures should be improved.

10.2 Dispute Complaint Channel

10.2.1 Establishment and Composition of Complaint Organization

In order to guarantee the legal rights of affected people, a convenient and quick, open and effective complaint mechanism will be established to provide a convenient, transparent, fair and effective complaint approach for affected people. Therefore, the complaint acceptance leading group of project environmental impact is established. At various levels of project management offices should assign special personnel to take charge of complaints of residents and villagers, publicize complaint telephone, and accept consultation and complaint of the public.

10.2.2 Complaint Procedures

The complaint handling leading group and its office will receive the public’s complaint as from one week after the project construction is started. At the same time, the complaint telephone and complaint mailbox will be started. The detailed complaint procedure is as follows:

1) First Stage

If residents in project area are discontented with the environment management plan or the construction and operation of the project affect the local environmental quality, they can put forward oral or written complaint to district subproject management office; for oral complaints, the district subproject management office needs to make treatment and
written record. Reasonable requirements or suggestions should be solved in 2 weeks after reception of the complaints.

2) Second Stage
If complainants are still unsatisfied with the treatment decision of the district subproject management office, they can lodge a complaint to the municipal project management office; the municipal project management office needs to make a treatment decision in two weeks after reception of the complaint.

3) Third Stage
If complainants are still unsatisfied with the treatment decision of municipal project management office, they can propose a report or complaint to local environmental protection bureau after receiving the decision.

10.2.3 Complaint Feedback Mechanism
Complaint feedback mechanism includes standardized recording, tracking and regular reporting systems.

1) Standardized recording: the complaint record mainly includes: basic situation of complainant, basic situation of complained items, basic situation of replier, solution and achieved effect.

2) Tracking: making a return visit to complainant to make sure whether the complaint is treated or not, whether the complainant is satisfied with the treatment effect or not, etc.

3) Regular report: complained issues should be regularly reported in writing to the higher level management office and written into the next year’s plan in order to avoid the occurrence of similar events.