China: Sustainable Urban Transport Project in Xi’an-Xinzhu
Bus Depot Project

Environmental Management Plan

Xi’an Public Transportation Corporation

October 2013
Directory

1 SUMMARY ........................................................................................................................................ - 1 -

1.1 CONSTRUCTION PROJECT SUMMARY ........................................................................ - 1 -
1.2 PROJECT DESCRIPTION AND THE PROJECT CONTENT ............................................. - 6 -
1.3 GOALS OF ENVIRONMENTAL MANAGEMENT PLAN ............................................. - 6 -
1.4 ENVIRONMENTAL MANAGEMENT PLAN STRUCTURE ............................................. - 6 -

2 ENVIRONMENTAL LAWS, POLICIES AND REGULATIONS ..................................................... - 8 -

2.1 COMPILATION BIAS OF ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN ........ - 8 -
2.2 REGIONAL ENVIRONMENT SITUATION ....................................................................... - 10 -
2.3 POLICY COMPLIANCE ....................................................................................................... - 13 -

3 ENVIRONMENTAL IMPACT ASSESSMENT .............................................................................. 17

3.1 PROJECT ENVIRONMENT CHARACTERISTICS ................................................................. 17

3.2 STATUS LAND FOR THE PROJECT ............................................................................. 17
3.3 REGIONAL ENVIRONMENTAL FUNCTION ZONING ....................................................... 17
3.4 ENVIRONMENTAL QUALITY STATUS ........................................................................... 17
3.5 THE MAIN ENVIRONMENTALLY SENSITIVE AREAS ..................................................... 19
3.6 ANALYSIS OF POLLUTION SOURCES .......................................................................... 19
3.7 ENVIRONMENTAL RISK ................................................................................................. 23

4 ENVIRONMENTAL MANAGEMENT ROLES AND RESPONSIBILITIES .................................. - 25 -

4.1 PARTICIPATION IN ENVIRONMENTAL MANAGEMENT AGENCIES ................................ - 25 -
4.2 ENVIRONMENTAL MANAGEMENT RESPONSIBILITIES DURING CONSTRUCTION .... - 26 -
4.3 CONTRACTOR MANAGEMENT ...................................................................................... - 29 -

5 THE ENVIRONMENTAL IMPACT AND MITIGATION MEASURES ........................................... - 31 -

6 SUPERVISION AND MONITORING PLANS ............................................................................ - 42 -

6.1 ENVIRONMENTAL SUPERVISION ............................................................................... 42
6.2 ENVIRONMENTAL QUALITY MONITORING PLAN ....................................................... 47

7 CONTRACTOR ENVIRONMENTAL SPECIFICATIONS ............................................................ - 51 -

7.1 CONTRACTOR ENVIRONMENTAL PROTECTION PLAN ................................................ 51
7.2 ON-SITE FACILITIES ........................................................................................................ 52
7.3 CODE OF CONDUCT ......................................................................................................... 52
7.4 HEALTH AND SAFETY .................................................................................................... 54
7.5 FUEL STORAGE, OIL AND HAZARDOUS TOXIC SUBSTANCES .................................. 55
7.6 WASTE MANAGEMENT ................................................................................................. 56
7.7 WASTEWATER AND STORM WATER MANAGEMENT ................................................... 57
7.8 NOISE CONTROL ............................................................................................................. 57
7.9 CONSTRUCTION PHASE COMMUNICATION WITH THE PUBLIC INFORMATION ........ 57
7.10 PHYSICAL CULTURAL RESOURCES ............................................................................ 58

8. EMERGENCY PLAN .................................................................................................................. - 60 -

8.1 CONTINGENCY PLAN ....................................................................................................... 60
8.2 CITY GAS ACCIDENT PREVENTION MEASURES ......................................................... 60
8.3 STRATEGIES SUDDEN ACCIDENT AND EMERGENCY PROGRAMS ............................ 61

9. ENVIRONMENTAL TRAINING AND CAPACITY PLANNING .............................................. - 63 -
9.1 CONSTRUCTION TRAINING

10. ENVIRONMENTAL PROTECTION INVESTMENT
1 Summary

The Environmental Management Plan (EMP) applies to the xinzhu bus depot project in Xi'an. The project is implemented by Xi'an Public Transport Corporation.

According to China's current environmental impact assessment laws and regulations as well as OP/BP4.01 of World Bank operational policies (environmental assessment), the subproject is classified as Category B projects, and is need for a environmental assessment study. EIA report includes environmental regulations policy analysis, project overview and engineering analysis, regional environmental and social state of the environment, the survey of existing environmental quality, project impact assessment, public participation, risk assessment and emergency response plans, environmental management and so on.

Environmental Management Plan is consistent with the requirements of national laws, regulations and technical guidelines, as well as World Bank's safeguard policies, including the World Bank Group Environmental, Health and Safety Guidelines. Environmental Management Plan applies the latest available and relatively economic strategy to achieve the project's mitigation objectives.

1.1 Construction Project Summary

Constructing of the xinzhu bus depot project in the west will effectively resolve regional population mobility problems and improve the ability to provide different modes of transport to facilitate the mass-intensive, energy-efficient and environmentally friendly bus travel. Changing conditions in the urban transportation from car driving to people-oriented to achieve smooth and sustainable development of urban transport, giving all citizens a better travel options, while comprehensive promoting municipal management capabilities and improving public transport enterprises operation.

The project is on the basis of Xi'an Municipal Development and Reform Document 324 [2008] issued by Development and Reform Commission, and in order for effectively relieving the pressure on public traffic in Xi'an, improving buses parking, maintenance, operation, scheduling and other issues on northern and international logistics park of Xi’an. The Xinzhu bus depot in the Xinzhu area is decided to be build to fill the gaps of northern bus depot.

Project construction site is located in xi ‘an international logistic park xinhe street, Planning covers eighty thousand square meters, Planning includes office building, Employee
activity room, maintenance shop, boiler room, water pump room, transformer room, concierge and accessories, oil and gas station and stopping pad, etc. A total construction area of 22051.9 square meters.
Figure 1 project orientation diagram
Figure 2  Project and the Surrounding Environment
Figure 3  total project plan
1.2 Project Description and the Project Content

The World Bank will provide loans to support the Xi’an West Bus Maintenance plant for civil engineering construction and equipment purchasing. Table 1 gives the project content covered by Environmental Impact Assessment and Environmental Management Plan, which includes construction contents using World Bank loans and domestic capital.

Table 1 Main Contents of the Project

<table>
<thead>
<tr>
<th>The principal part of the project</th>
<th>construction content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office building (Construction area of 2955 square meters, Three layers, ground floor: control center; two to three layers: The office), Repair shop, car wash, oil and gas station and stopping pad etc. A total construction area of 22052 square meters</td>
<td></td>
</tr>
<tr>
<td>Aided engineering</td>
<td>Project is equipped with the transformer room, pump room, boiler room and other auxiliary facilities</td>
</tr>
<tr>
<td>Public works</td>
<td>The water supply: International port district municipal water supply network The power supply: International harbor area substation T interface Heating: Harbor district central heating Gas supply: Harbor area of city gas pipeline supply</td>
</tr>
<tr>
<td>Environmental protection engineering</td>
<td>Garbage collection: Living garbage pickup by the local sanitation department, waste classified collection wastewater treatment: Wastewater after treated by septic tanks into the urban sewage pipe network greening: Green area of 10000 square meters Refueling stations: The oil and gas recovery system are collected Noise processing: For the equipment, set up necessary shock absorption and noise reduction of the noise control measures</td>
</tr>
</tbody>
</table>

1.3 Goals of Environmental Management Plan

Environmental Management Plan implements appropriate mitigation measures identified in the environmental impact and the monitoring of such measures effectiveness within the project life cycle. Environmental Management Plan is compiled based on Environmental Impact Assessment and Plan Environmental Assessment in accordance with Chinese environmental laws and guidelines, the World Bank Safeguard Policies and best similar projects’ practice. The goal of Environmental Management Plan is to ensure the consistency of Environmental Impact Assessment and Environmental Management Plan in order to achieve the appropriate standards of environmental protection. Environmental Management Plan effectively meets supervision requirements and provides guidance for project owners to manage contractors and subcontractors.

1.4 Environmental Management Plan Structure
A key component of Environmental Management Plan includes procedures related to project during the construction and operational management of the overall environment. Environmental Management Plan includes as follows:

- Environmental Management Roles and Responsibilities;
- Mitigation Measures
- Supervision and Monitoring Plans
- Contractor Environmental Specifications
- Emergency Response Plan
- Publicity and Stakeholder Participation Plan
- Environmental Training and Capacity Building Programs
- Budget for Implementing Environmental Management Plan

Environmental Management Plan provides sufficient information for project owners, contractors, subcontractors to implement the Environmental Management Plan and focus on the following issues:

- Meet environmental requirements established by China, Shannxi Province, and the World Bank;
  - Meet the national, provincial and municipal governments all environmental and social economy conditions aim for project approval, permit and related policies;
  - During the project implementation, develop, facilitate and promote the common sense of responsibility to the environmental and social economy;
  - Improve the regulator and Xi’an Fengwei New Area Administrative Committee (including its contractors) environmental awareness and understanding through training and clear all parties environmental and social management roles and responsibilities;
  - Supervise environmental and social performance throughout the project cycle and adopt an adaptive management approach to achieve environmental continuous improvement on demonstration base and minimize the impact;
  - Work with local communities and affected stakeholders to ensure that they benefit from the project development;
  - At all stages of the project supervision process, notice, invite and allow local stakeholders to participate in;
2 Environmental Laws, Policies and Regulations

Existing regulations and legal requirements drew up by Governments at all levels in China and the World Bank are summarized below. Environmental Impact Assessment Chapters I and II outlines the project-related regulations, policies, guidelines, standards, and planning. Environmental Management Plan meets these legal requirements, the implementation of policies and procedures.

1.2 Compilation Bias of Environmental Impact Assessment and Environmental Management Plan

1.2.1 EIA documents and Feasibility Study Report
(1) The Feasibility Study Report of Xi’an city's comprehensive transportation improvement project (World Bank Loan Mid-term Adjustment) Xinzhu Bus Depot, in Maich 2008, Chang’an University;
(2) The Environmental Impact Statement of Xinzhu Bus Depot Project, September 2013, Ningxia intelligence safety and environment science and technology development limited company.

1.2.2 State environmental protection laws and regulations
(1) People's Republic of China Environmental Protection Law, 1989.12
(2) People's Republic of China Environmental Impact Assessment Law, 2002.10.28;
(3) People's Republic of China Air Pollution Prevention Law2000.4.29;
(4) People's Republic of China Water Pollution Control Act (Revised), 2008.2.28;
(5) People's Republic of China Environmental Noise Pollution Prevention Law, 1996.10.29
(6) Construction Project Environmental Protection Management Regulations (State Council Decree No. 253), 1998.11;
(7) People's Republic of China Solid Waste Pollution Prevention Law(revised), 2004.12.29
(8) People's Republic of China Cleaner Production Promotion Law,2002.6.29

1.2.3 The relevant provisions of the The World Bank
(1) The World Bank OP/BP4.01 (Environmental Assessment).

1.2.4 Technical Guidelines for Environmental Impact Assessment
1.2.5 Evaluation Criteria

Based on project location and applicable zoning issued by Xi'an Municipal Government on the water environment, ambient air and noise-related laws and regulations, the following evaluation criteria are adopted.

2.1.5.1 Environmental quality standards

(1) Ambient air quality performs Ambient Air Quality Standard (GB3095-2012) secondary standard;

(2) The implementation of the acoustic environment Environmental Quality Standard (GB3096-2008) Class 4 District standards;

2.1.5.2 Pollutant emission standards

(1) The implementation of wastewater discharge Integrated Wastewater Discharge Standard (GB8978-1996) level 3 standards and the Yellow River Valley (Shaanxi Section) Integrated Wastewater Discharge Standard (DB61/224-2011) level 2 standard;

(2) The implementation of air pollutants emission Gas Station Air pollutants Emission standards (GB20952-2007) and Air Pollutants Integrated Emission Standards (GB16297-1996) level 2 standard; project restaurant lampblack emissions with reference to the implementation of Catering Lampblack Emission Standards (GB18483-2001);

(3) Factory bound noise performs Boundary of Industrial Enterprises of Environmental Noise Emission Standards (GB12348-2008) Class 2 District standards;
(4) The implementation of construction noise Construction Field Boundary Environmental Noise Emission standards (GB12523-2011) relevant regulations;
(5) General industrial solid waste discharging implementation of General Industrial Solid Waste Storage and Disposal Sites Pollution Control Standards (GB18599-2001);

2.1.5.3 Other emissions standards

(1) The city public transport station, field, factory design code (CJJ15-87);
(2) Health standard for design of industrial enterprises, GBZ1-2010);
(3) The design and construction of a LPG gas (GB 50156-2012)
(4) The code for design of extinguisher disposition (GB50140-2005)

2.2 Regional environment situation

2.2.1 Natural environment conditions

(1) The geographical position

Xi'an international port district is located in the northeast of xi'an urban area between BaHe and Wei river delta region, planning control area covers an area of 120 square kilometers, the planning construction of these areas covers an area of 44.6 square kilometers.

Construction of the project site is located in xi'an international port district xinhe streets, with projects in the east west road, north longhai railway and zhengxi passenger dedicated railway bridge, the project center geographical coordinates: latitude 34°24'08", east longitude 109°07'30", the project is located in the ancient city of xi'an east, north and gaoing river, many development zone in the east with lintong district, west with the city new district, south to xi'an international port district, the traffic is convenient.

(2) Topography and geomorphology, geology

The high terrain southeast, northwest low, ladder shaped tilt, southeast of LiShan XiLu, YouHong shanti village of the original, the highest elevation of 1421.7 m. Northwest BaHe, action and the wei river valley bottom impact plain, the minimum is 358.9 m above sea level. Jurisdiction Ba action after two rivers across the phase transfer in the central north wei river.

(3) Climate and weather
Project is located belongs to the warm temperate zone continental monsoon sub-humid climate, four seasons weather, climate is mild. All the year round average temperature of 13.3 °C. The coldest in January, the average temperature 1.0 °C; The hottest July, the average temperature of 26.8 °C. An average annual rainfall 584.1 mm of precipitation period are mainly distributed in the fall. Perennial dominant wind direction for the northeaster, frequency is 10%; Time leading the direction of the wind for southwest, frequency was 7%, the high frequency was 35%, no annual average wind speed 1.7 m/s

(4) Hydrological characteristics

The main surface water bodies is BaHe project location. BaHe of wei river tributaries, river, about 109 km, the basin area of 2581 km2. For many years the average runoff 12.6 m³/5 ~ 60 m³/d, the coefficient of permeability of water yield from 20 to 126 m³/h. Comprehensive recharge groundwater resources are rich, for many years the average of 2.2 x 10³ m³ can be mined for 1.8 x 10³ m³, according to xin an dynamic observation data of underground water level range of 1.2 ~ 2.0 m, rising water levels in a wet year 2 m or so. At present, due to reduce surface water irrigation, exploitation of groundwater irrigation, is on the decline of groundwater in the region.

(5) The earthquake

Project area of seismic intensity area for VII degree, fortification earthquake intensity for VIII.

2.2.2 Social environment situation

Xi ‘an international port district is located in the northeast of xi ‘an urban area between Ba river and wei river delta region, planning control area covers an area of 120 square kilometers, the planning of these areas covers an area of 44.6 square kilometers. Park planning form six main functions (March around the city highway-north third ring road, xiyu high-speed, high-speed planning airport link, caolin road, fangwei road and Harbour road,), the eight functional partition (container handling zone, comprehensive bonded zones, auxiliary facilities for the domestic trade area, comprehensive service area, residential area, emergency logistics park, the industrial transfer to undertake area, urban and rural areas as a whole these areas). The park through the coastal ports in the port service function moved to xi ‘an, with the help of xi ‘an railway container freight terminal comprehensive free trade zone, xi ‘an, xi ‘an highway port function superposition effect, achieve road, rail, air, sea and multimodal transport is convenient, efficient operation, thus
giving full play to the advantages of Xi’an transportation hub, improve logistics efficiency, reduce logistics cost, with big logistics service industry development, promote industrial aggregation and ascend. "Xi’an international port district industry development orientation is a construction of China’s largest international Land port and ecological improvement area the largest trade and logistics center, make modern service industry new town".

Xinhe street is located in the ancient city of Xi’an east, north and Gaoling river, many development zone in the east with Lintong district, west with the city new district, south to Xi’an international port district, action Ba biome is linked together, a total area of 50.87 square kilometers and a population of 45000 people, jurisdiction over 25 administrative villages, 149 villager group.

In recent years, seriously implement Xinhe street district party committee, the district government building in the east new district, in the construction of a new humanism ecological strategy Ba bridge, tightly hold a tap (key project), "three emphasis (one is the international harbor area and container freight station construction of industry chain extension of the project; the second is the Wei river development and construction of coastal governance; three is the construction of urban agriculture development train of thought. According to this train of thought, the scientific development vision to re-examine the industrial structure of the whole street, identified the five regional layout, to realize scientific and sustainable development. Southern international port area container freight station as the core, focus on the development and construction in modern logistics, warehousing, station services and catering trade of the third industry, with emphasis on the project; To Ba northern Wei river comprehensive treatment for the power, accelerate the construction of ecological landscape area, promote Ba liu yongji ecological construction project of north east extension expanding; East xiyu for high-speed axis, focus on the development by the high quality fruit as the main body of the xiyu economic forest, developing rural economy new growth point; West of the west port industry as the core, forge a hydrophilic type of real estate industry; Central to Ba geng, Fangwei road and Xihan road as the axis, focus on the development of construction of pollution-free vegetables, intensive dairy farming as the main body of urban agriculture, increase depends on the city, the service functions of the city.

Xinhe streets in the construction of urban agriculture as the goal, actively implement the brand strategy, optimize the industrial structure. To a Oriental dairy co., LTD., vigorously
develop production of dairy industry, "duoxian" brand series products are very popular with consumers. In xi'an henglv co., LTD., and the farmers' professional association to support, make "xinhe" brand high-quality goods pollution-free fruits and vegetables brand, "xinhe" brand fruit and vegetable is famous in xi'an market. Based on "xiyu" fruits and vegetables industry area construction, develop the landscape forest. Jurisdiction enterprise fast development, has formed the dairy products forging, smelting, building material chemical and optical element four pillar industries. Fully rely on 'Ba nutrient-laden delta' advantage of project development, xi'an international port area, to develop the real estate industry, fishing and sightseeing, leisure vacation, logistics service, etc. The third industry.

2.3 Policy Compliance

2.3.1 World Bank Policy

In the ten World Bank safeguard policies which, OP/BP4.01 "environmental assessment", OP / BP 4.12 "Involuntary Resettlement" apply to this project. See table 2-1.

<table>
<thead>
<tr>
<th>The serial number</th>
<th>Security policy</th>
<th>compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The OP/BP4.01 &quot;Environmental assessment&quot;</td>
<td>Class B project; The formulation of the &quot;environmental management plan&quot;; Carried out the public participation in eia preparation process</td>
</tr>
<tr>
<td>2</td>
<td>The OP/BP4.04 &quot;Natural habitat&quot;</td>
<td>Is not applicable to this project, the project does not involve the use of natural habitat</td>
</tr>
<tr>
<td>3</td>
<td>The OP/BP4.36 &quot;Forest&quot;</td>
<td>The policy is not enabled. The project will not aid those involved in the policy defined in the forest or related important major change or degradation of natural habitat.</td>
</tr>
<tr>
<td>4</td>
<td>The OP/BP4.09 &quot;Pest management&quot;</td>
<td>The policy is not enabled. The project will not purchase any pesticides, also won't lead to increased pesticide use. On the basis of the policy, don't need to take any action.</td>
</tr>
<tr>
<td>5</td>
<td>The OP/BP4.11 The material and cultural resources</td>
<td>The policy is not enabled. According to the on-site visit and the cultural relics department investigation did not find any cultural relics and other material and cultural resources. Projects in construction process such as found that the ancient sites and ancient tombs, should contact xi'an cultural relic archaeology, to discover. Found that the cultural relics belong to the state, no unit or individual shall plunder, privately distribute, hiding.</td>
</tr>
<tr>
<td>6</td>
<td>The OP/BP4.37 The dam safety &quot;.&quot;</td>
<td>The policy is not enabled. There is no dam project area.</td>
</tr>
<tr>
<td>7</td>
<td>The OP/BP4.10 &quot;The native&quot;</td>
<td>The policy is not enabled. No indigenous people living in the project area or affect indigenous peoples</td>
</tr>
<tr>
<td>8</td>
<td>The OP/BP4.12 The involuntary immigration</td>
<td>Has compiled due diligence report</td>
</tr>
<tr>
<td>9</td>
<td>The OP/BP7.50</td>
<td>The policy is not enabled. The project area does not involve any international</td>
</tr>
</tbody>
</table>
The World Bank Group Environment, Health and Safety Guidelines also applies to this project. Mitigation measures Environmental Management Plan items included in full compliance Environment, Health and Safety Guidelines requirements (especially with the construction management-related content), because the "Guide" in the general requirements also exist in China's legal, regulations, guidelines and standards into construction management.

Environmental Management Plan in the various measures are fully meet the requirements of Environment, Health and Safety Guide. (See Table 2-2).

**Table 2-2 the world bank group "environmental, health and safety guide compliance to requirements of the project schedule**

<table>
<thead>
<tr>
<th>The world bank &quot;environmental, health and safety guide</th>
<th>Environmental impact assessment/environmental compliance management plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust or particulate matter (PM) is the most common unorganized emissions of pollutants. Some operations (such as solid material transportation and outdoor storage) and bare soil surface (including not paved roads) releases particles.</td>
<td>Adopt the method of dust control during the construction, such as cover, the water dust-controlling or improve the moisture content of material stack in the open air, use water spray control method to control the conveying material on the surface of the pavement or paved roads.</td>
</tr>
<tr>
<td>To the public or private wastewater treatment system discharge of industrial waste water and living waste water, waste water produced by utilities operation or rain, meet the emissions into the pretreatment of the wastewater treatment system and monitoring requirements.</td>
<td>Project production wastewater after separation tank treatment first, then by septic tanks and sewage into the urban sewage pipe network, achieve the sewage discharged into urban sewage water quality standard &quot;(CJ) 343-2010 A grade of rear can into the sewage treatment plant.</td>
</tr>
<tr>
<td>The rain should be separated, and industrial wastewater and domestic wastewater to reduce the amount of waste water treatment should be made before discharge.</td>
<td>Take rain and sewage diversion projects, construction drainage, sewage pipe respectively.</td>
</tr>
<tr>
<td>If in the most sensitive receiver, project facilities or activities generated by the noise will exceed the relevant noise index, noise prevention and control measures should be adopted.</td>
<td>Select the sound power level lower equipment; Repair of mechanical equipment installation vibration isolation device; Limit the operation of the specific equipment or time;</td>
</tr>
<tr>
<td>In may, under the condition of facilities and the project should avoid, minimize and control due to atmospheric emissions to human health, safety and environment caused by the negative effects.</td>
<td>Main project waste gas exhaust gasses from the paint spray paint room, paint room fuel gas and a small amount of welding fumes produced in welding process. Suggested that the spray paint and dry type activated carbon environmental protection device for the room of the lacquer that bake, paint mist through filtration + activated carbon filtration layer after filtering harmful substances in waste gas, the</td>
</tr>
<tr>
<td>The potential recyclable materials recycling; Identify and recycling field back into product manufacturing or industrial activity.</td>
<td>On the vehicle exhaust parts and tyres, etc., all these waste after manufacturer centralized collection can be recycled and processing, will not cause secondary pollution to environment.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>For hazardous substances to leak prevention and control plan, training for operators to protect against leakage, implement the inspection plan, map at the scene of the emergency plan of hazardous materials distribution location and operating activities associated with the site, the required personal protective equipment and emergency training to provide a written regulations;In writing rules must be equipped with at least enough to meet the demand of spill accident preliminary processing of spill processing equipment, which lists available when necessary external equipment and manpower resources to overcome the lack of internal resources</td>
<td>Production equipment maintenance repair factory waste engine oil, oily waste cotton yarn, etc., for dangerous solid waste, should according to the requirements about waste disposal, dedicated storage facilities, storage facilities should be far away from the dormitory, office building, canteen and sensitive. Hazardous waste processing by qualified unit re gularly. Factory set up dangerous solid waste staging, and make the waste oil, waste solvents, such as liquid hazardous waste collection. This project should be strengthened to education of staff, improve the paint, thinner, flammable, explosive. To set up the flammable explosive logo, smoking is prohibited in the workplace; Loading and unloading, transportation, we will strictly control, pay attention to light put; Residual paint, thinner, pay attention to the preservation, should be packed into special vessels, To avoid hurting others</td>
</tr>
<tr>
<td>Sewage treatment facilities for design, construction, operation and maintenance, make the sewage to fulfill the requirements of relevant national or international acceptance criteria</td>
<td>Reach the sewage discharged into urban sewage water quality standard (CJ), 343-2010 A grade</td>
</tr>
</tbody>
</table>

### 2.3.2 Domestic laws and regulations

In table 2-3 summarizes the project for the key to China's national laws and regulations compliance.

#### Table 2-3 in China's domestic laws and regulations of compliance

<table>
<thead>
<tr>
<th>Chinese laws and regulations</th>
<th>Project compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental impact assessment law</td>
<td>1. Complete the eia report by the environmental impact assessment of a certified consultant and project units, and approved by the shaanxi province Environmental protection bureau . 2. Carried out two rounds of public consultation.</td>
</tr>
<tr>
<td>About strengthening the construction of international financial organizations loan project eia management notification</td>
<td>The eia report and the environmental management plan in accordance with the world bank's security policy.</td>
</tr>
<tr>
<td>The land administration law of the People's Republic of China</td>
<td>Base land property belongs to the land for construction purposes, in line with the xi’an general land use planning (2006-2020),</td>
</tr>
<tr>
<td>Water pollution prevention law</td>
<td>1. The drainage pipe network project construction, focus on sewage processing. 2. Not in surface sources protection zones for outlet of sewage</td>
</tr>
<tr>
<td>Chinese laws and regulations</td>
<td>Project compliance</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>law for the preservation of antiques</td>
<td>In construction engineering, no units or individuals find relics, shall protect the scene and immediately report to the local administrative department of cultural relics</td>
</tr>
</tbody>
</table>
3 Environmental impact assessment

3.1 Project environment characteristics

Xinhe street, xi'an international port district project in the east xihan road, north longhai railway and zhengxi passenger dedicated railway bridge, the project center geographical coordinates: latitude 34 ° 24 '08", longitude 109 ° 07 '30 " , the project is located in the ancient city of xi'an east, The north and gaolingjing river development zone lies between a river , East into the lintong district. The west and xi'an government new district are interlinked, south to xi'an international port district, the traffic is convenient.

After the completion of the project, will promote the bus partitioning on-site maintenance, improve the reliability of bus operation, reduce the traffic pressure on the city.

3.2 Status land for the project

Project planning land land integrity intact, flat surface, and good geological conditions. Project around the main road to xihan road, the longhai railway, zhengxi passenger dedicated railway bridge and so on.

Project around sensitive target mainly include xiaoyan village, located on the north side of the project.

3.3 Regional environmental function zoning

1. ambient air

Implementation of air quality of the environment, Ambient Air Quality Standard (GB3095-2012) two criteria;

2. the acoustic environment

Evaluation of the implementation of regional environmental noise sound environmental quality standards (GB3096-2008) Class 2 District standards, road traffic arteries on both sides of the regional implementation of the standard 4a class standards.

3.4 Environmental Quality Status
During the environmental assessment, air environment of the project, the present situation of acoustic environment monitoring, environment quality present situation to determine the project area

1. Ambient air quality

The present situation of atmospheric environment quality assessment reference 'Ba bridge district xian city environmental monitoring station on May 16 ~ 22, 2013 for the xigang real estate development (group) co., LTD. Qianliu village 10 tons of gas boiler project ', the background of monitoring data, that project is located in port area xinzhu town. At about 4 km south-west of this project

- Monitoring unit: xi 'an Ba bridge district environmental monitoring station
- Monitoring time: on May 16, 2013-2013 on May 22
- Monitoring project: SO2, NO2 and PM10
- Monitoring methods: monitoring project analysis methods and basis according to the ambient air quality standard (GB3095-2012) of the relevant provisions.
- Monitoring frequency: continuous monitoring, For seven days, everyday of SO2, NO2 continuous sampling 18 h, PM10 continuous sampling 12 h every day.

Monitoring results: May 16 ~ 22, 2013, hours of SO2 concentration range of 0.010 ~ 0.031 mg/m3, accounts for the largest rate was 6.2%, the average range of 0.022 ~ 0.028 mg/m3, accounts for the largest rate was 18.67%, meet the environmental air quality standard (GB3095-2012) secondary standard; The NO2 hours density range of 0.009 ~ 0.031 mg/m3, accounts for the largest rate was 15.1%, the daily average concentration range of 0.024 ~ 0.028 mg/m3, accounts for the largest rate was 35%, meet the ambient air quality standard "GB3095-2012) secondary standards; PM10 daily average range of 0.153 ~ 0.183 mg/m3, of standard rate of 102% ~ 122%, exceed the 2% ~ 22%.PM10 levels mainly related to xi 'an is located in the northwest arid areas, at the same time, the international harbor area belongs to the early development and construction, the construction site construction
activity is frequent, overall urban function not fully formed, the region PM10 overweight also accord with the actual situation of xi’an.

2. Sound environment quality

Project area is mainly influenced by traffic noise, on the east side is xihan highway (G210), The traffic is very busy. on the north is longhai railway and zhengxi passenger dedicated line, on September 1, 2013, investigates the present conditions of the project noise at boundary of environment monitoring.

Monitoring results: the evaluation of regional present situation of acoustic environmental quality meet the standards for acoustic environmental quality (GB3096-2008) 3, 4 class standards, acoustic environment quality present situation is good.

3.5 The main environmentally sensitive areas

May be affected by the project’s environmental and social impact sensitive areas are shown in Table 3.5-1.

Table 3.5-1 sensitive area environment and society

<table>
<thead>
<tr>
<th>The serial number</th>
<th>Environmental sensitive area surrounding the project</th>
<th>With the relative position in the project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Xiao yan village</td>
<td>N, 180m</td>
</tr>
</tbody>
</table>

3.6 Analysis of pollution sources

(1) The main environmental impacts of behavior in the construction period

According to site survey and investigation, the behavior of the main environmental impacts of the construction period are shown in Table 3.6-1.

Table 3.6-1 major environmental influence the behavior of the construction period

<table>
<thead>
<tr>
<th>No.</th>
<th>The main environmental influence behavior</th>
<th>Environmental impact factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water and sewage sludge generated in the construction</td>
<td>Water Pollution</td>
</tr>
<tr>
<td>2</td>
<td>Construction dust, machinery and equipment exhaust</td>
<td>Air Pollution</td>
</tr>
</tbody>
</table>
Environmental impact of the construction of the main air pollutants are dust and construction machinery, vehicle exhaust emissions, ground excavation, loading and unloading of construction materials, spoil, construction waste, vehicle access to the site, etc., will produce dust; noise pollution mainly the noise generated by the construction and running of the vehicle.

(2) The main environmental impacts behavior at runtime

The main environmental impacts of run-time behavior is shown in Table 3.6-2

<table>
<thead>
<tr>
<th>No.</th>
<th>The main environmental influence behavior</th>
<th>Environmental impact factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paint shop maintenance of major pollutants emissions generated by sanding: paint mist, toluene, xylene, dust</td>
<td>Air Pollution</td>
</tr>
<tr>
<td>2</td>
<td>Welding smoke emissions (the main pollutants: soot)</td>
<td>Air Pollution</td>
</tr>
<tr>
<td>3</td>
<td>Parking automobile exhaust (main pollutants: soot, NOx, HC compounds, etc.)</td>
<td>Air Pollution</td>
</tr>
<tr>
<td>4</td>
<td>Fuel, exhaust gas stations generated (major pollutants: total non-methane hydrocarbons, natural gas)</td>
<td>Air Pollution</td>
</tr>
<tr>
<td>5</td>
<td>Canteen exhaust fumes (main pollutants: NOx, SO2, soot, etc.)</td>
<td>Air Pollution</td>
</tr>
<tr>
<td>6</td>
<td>Car repair, car wash water, wastewater and domestic wastewater office, canteen cooking water</td>
<td>Water Pollution</td>
</tr>
</tbody>
</table>
Among automotive maintenance equipment (air compressor, drum machines, compressors, etc.) noise, car noise and run debug smoke exhaust fan painting room, pump room noise

Abandoned auto parts, garbage, cafeteria food waste and waste oil, cotton oil paint residue and other solid waste

(3) Pollution source analysis

A. Waste water pollution source analysis

According to the engineering construction content, water unit mainly includes washing wastewater, vehicle maintenance and repair waste water and domestic water, canteen cooking water, green water, etc. According to the shaanxi province people's government notice about the printing industry in Shanxi Province water quota (shaanxi province politics [2004] no. 18), approved by engineering water consumption of about 23397 m³ / a, engineering about 16848 m³ / a waste water discharge.

B. exhaust gas pollution source analysis

Project operation period of the main atmospheric pollutants including maintenance workshop produce spray paint grinding exhaust gas (main pollutants: paint mist, toluene, xylene, dust) and welding smoke exhaust gas (main pollutants: smoke);Parking lot (main pollutants: automobile exhaust soot and NOx, HC compound, etc.);Gas, LPG stations, in which exhaust (main pollutants: the total hydrocarbon, methane gas);Canteen lampblack gas (main pollutants, NOx, SO2, lampblack, etc.).These pollutants are intermittent discharge, the specific production line are shown in table 3.6 4.

<table>
<thead>
<tr>
<th>Content type</th>
<th>Emission source</th>
<th>Name of pollutants</th>
<th>Treatment before discharge concentration and (units)</th>
<th>Emission concentration and emissions (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmospheric pollutants</td>
<td>Automobile exhaust</td>
<td>CO</td>
<td>2.0 t/a</td>
<td>2.24t/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO2 hydrocarbon</td>
<td>0.27 t/a</td>
<td>0.29t/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.42 t/a</td>
<td>0.47t/a</td>
</tr>
<tr>
<td></td>
<td>Waste gas of the lacquer that</td>
<td>benzene</td>
<td>5.75mg/m³</td>
<td>0.29mg/m³</td>
</tr>
<tr>
<td></td>
<td>bake</td>
<td>toluene</td>
<td>39.1mg/m³</td>
<td>1.96mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>xylene</td>
<td>18.4mg/m³</td>
<td>0.92mg/m³</td>
</tr>
<tr>
<td></td>
<td>Welding gas</td>
<td>The smoke</td>
<td>500mg/m³</td>
<td>50mg/m³</td>
</tr>
</tbody>
</table>
C. Solid waste pollution source analysis

Project operating period to produce auto parts waste, living garbage, and dining room to eat hutch garbage and waste engine oil, oil paint slag cotton yarn, such as solid waste, details are shown in Table 3.6.5.

<table>
<thead>
<tr>
<th>Content type</th>
<th>Emission source</th>
<th>Name of pollutants</th>
<th>Treatment before discharge concentration and (units)</th>
<th>Emission concentration and emissions (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid waste pollution</td>
<td>The garbage</td>
<td>Living garbage</td>
<td>165 t/a</td>
<td>0, Send the sanitation department unified handling</td>
</tr>
<tr>
<td></td>
<td>General industrial solid waste</td>
<td>Waste tyre and waste scrap parts, welding rod, waste slag, waste packing material</td>
<td>30 t/a</td>
<td>0, recycling</td>
</tr>
<tr>
<td></td>
<td>Dangerous industrial solid waste</td>
<td>Waste engine oil</td>
<td>1.5 t/a</td>
<td>0, Send qualified waste disposal processing units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low filter cotton</td>
<td>0.9 t/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activated carbon</td>
<td>0.6 t/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste cloth gloves</td>
<td>0.3 t/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waste oil</td>
<td>0.9 t/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>sludge</td>
<td>30 t/a</td>
<td></td>
</tr>
</tbody>
</table>

D. Noise pollution is analyzed

Project the main noise including mechanics repair equipment (air compressor, light drum machine, compressor, etc.), car running debugging noise and spray paint room of exhaust flue gas fan, water pump noise, etc. Main noise sources are shown in Table 3.6-6.
Table 3.6-6 main operating phase noise equipment pollution source analysis

<table>
<thead>
<tr>
<th>The production area</th>
<th>location</th>
<th>Produce noise device name</th>
<th>Noise level</th>
<th>Measures required</th>
<th>note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair shop equipment</td>
<td></td>
<td>Electric welding machine</td>
<td>80~85</td>
<td>Sound insulation of workshop</td>
<td>Mechanical noise, intermittent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hammer</td>
<td>90</td>
<td>Sound insulation of workshop</td>
<td>The tapping, The instantaneous</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air compressor</td>
<td>82</td>
<td>The silencer,Sound insulation of workshop</td>
<td>Air power performance, continuous</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Send exhaust fan</td>
<td>85~90</td>
<td>Noise elimination and damping, Sound insulation of workshop</td>
<td>Air power performance, intermittent</td>
</tr>
<tr>
<td>The pump room water pump room</td>
<td>The water pump</td>
<td></td>
<td>80</td>
<td>Vibration reduction, Sound insulation</td>
<td>Mechanical noise, continuous</td>
</tr>
<tr>
<td>Equipment workshop</td>
<td>Equipmen t workshop</td>
<td>Diesel generator</td>
<td>95</td>
<td>Sound insulation, Vibration reduction</td>
<td>Mechanical noise, continuous</td>
</tr>
<tr>
<td>The dining room</td>
<td>Food and beverage</td>
<td>Fan lampblack purification device</td>
<td>75~85</td>
<td>Noise elimination, sound interatrial septum</td>
<td>Air power performance, intermittent</td>
</tr>
<tr>
<td>station</td>
<td>The car</td>
<td>Motor vehicle traffic noise</td>
<td>60~70</td>
<td>The speed limit, The forbidden singing, management</td>
<td>Traffic noise, intermittent</td>
</tr>
<tr>
<td>Refueling stations equipment</td>
<td>The compressor</td>
<td></td>
<td>85~90</td>
<td>Sound insulation, Vibration reduction</td>
<td>Mechanical noise, intermittent</td>
</tr>
</tbody>
</table>

3.7 Environmental Risk

Environmental risks mainly in the proposed filling, refueling area, the main risk types including tank leaks, explosions of paint, resulting in pollution would harm the environment, it must be a sound security measures to prevent accidents.

3.8 Public Participation

According to the World Bank Environmental Impact Assessment Policy (OP4.01), and the need for public participation in the preparation of the corresponding chapter, therefore, conducted a public participation, public participation involving the main target of the project area, directly or indirectly affect the masses. The full text of the environmental management plan has been publicized to the public in Xi’an Public Transport Company Website in April 25 2014. Figure 4 showed the conditions.
公交新筑保养场子项目环境管理计划

目录
1 概述
1.1 项目名称
1.2 项目描述
1.3 项目内容
1.4 实施方案
1.5 项目实施时间
1.6 项目实施地点
1.7 项目实施单位
1.8 项目实施人员
1.9 项目实施设备
1.10 项目实施材料
1.11 项目实施进度
1.12 项目实施步骤
1.13 项目实施效果

2. 环境管理目标
2.1 环境管理目标
2.2 环境管理目标
2.3 环境管理目标
2.4 环境管理目标
2.5 环境管理目标
2.6 环境管理目标
2.7 环境管理目标
2.8 环境管理目标
2.9 环境管理目标
2.10 环境管理目标

3. 环境管理措施
3.1 环境管理措施
3.2 环境管理措施
3.3 环境管理措施
3.4 环境管理措施
3.5 环境管理措施
3.6 环境管理措施
3.7 环境管理措施
3.8 环境管理措施
3.9 环境管理措施
3.10 环境管理措施

4. 环境管理效果
4.1 环境管理效果
4.2 环境管理效果
4.3 环境管理效果
4.4 环境管理效果
4.5 环境管理效果
4.6 环境管理效果
4.7 环境管理效果
4.8 环境管理效果
4.9 环境管理效果
4.10 环境管理效果

Figure 4 site of the public
4 Environmental management roles and responsibilities

4.1 participation in environmental management agencies

Implementation of the Environmental Management Plan requires the participation of multiple agencies and departments; each institution plays a different but important role to ensure effective environmental management of the project.

Basically, the environmental processes involved in the management of two bodies: Responsible organization or implementation of the Environmental Management Plan organization, as well as relevant standards, laws and regulations, supervision and Environmental Management Plan in the project during the construction and operational execution and implementation of the project as well as the overall environmental performance of the organization. Environmental Management Plan during construction of the project organizational structure see Figure 5.

![Management structure during construction](image-url)
Table 4.1-1 lists the major environmental management responsibilities of each agency.

Table 4.1-1 environmental management responsibilities

<table>
<thead>
<tr>
<th>NO.</th>
<th>Organization / unit</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Xi'an Urban Infrastructure Construction Investment Group Co., Ltd.</td>
<td>Xi'an Urban Infrastructure Construction Investment Group Co., Ltd. will be responsible for implementation of the project management and coordination. Its World Bank Office (PMO) will be the implementation of the daily management and coordination, supervision and implementation of the project and responsible for the project to meet the requirements of the World Bank.</td>
</tr>
<tr>
<td>2</td>
<td>Shaanxi Provincial Environmental Protection Office</td>
<td>Shaanxi Provincial Environmental Protection Office is responsible for reviewing and approving the project EIA, will be responsible for the implementation of laws, regulations, technical guidelines and environmental quality standards during the project construction and operation.</td>
</tr>
<tr>
<td>3</td>
<td>Weiyang District Xi'an Environmental Protection Agency and the Environmental Protection Branch</td>
<td>Representatives during the construction and operation of monitoring the implementation of the Provincial Environmental Protection Office of Environmental Protection, and supervision. Disturbing the investigation and handling of complaints during construction. Ensure three while ensuring the normal operation of environmental protection facilities.</td>
</tr>
<tr>
<td>4</td>
<td>Xi'an Public Transport Corporation</td>
<td>Xi'an Public Transport Corporation will implement more infrastructure projects, including procurement, construction management, security and compliance policy implementation, and monitoring and reporting.</td>
</tr>
<tr>
<td>5</td>
<td>Environmental Supervision Engineer</td>
<td>Environmental supervision engineer responsible for inspecting, monitoring and audit all contractors to carry out construction work and other activities, and ensure compliance with environmental requirements and contractual requirements. Refers to the environmental engineering supervision functions of supervision.</td>
</tr>
<tr>
<td>6</td>
<td>Contractor</td>
<td>Project owners hire construction contractors will be responsible for project activities.</td>
</tr>
<tr>
<td>7</td>
<td>Environmental quality monitoring consultant</td>
<td>Environmental quality monitoring consultant will conduct a professional monitoring agency said environmental quality monitoring in accordance with the environmental monitoring plan contained in the environmental impact assessment report of. The project owner will hire consultants to monitor environmental quality monitoring program implementation. Refers Environmental Monitoring Station.</td>
</tr>
</tbody>
</table>

4.2 Environmental management responsibilities during construction
Xi'an Urban Infrastructure Construction Investment Group Co., Ltd. and Xi'an Public Transport Corporation

Xi'an Urban Infrastructure Construction Investment Group Co., Ltd. is the owner of the project. It will be fully responsible for the management and coordination of project implementation. Its World Bank Office (PMO) will be the implementation of the daily management and coordination, supervision and implementation of the project and responsible for the project to meet the requirements of the World Bank. Xi'an Public Transport Corporation for a specific project implementing agency, Shaanxi Provincial Environmental Protection Office and the World Bank is responsible for overseeing implementation of the project. Therefore, it is responsible for ensuring compliance with the environmental management project "Environmental Management Plan" and related regulations.

Environmental management responsibilities Xi'an Public Transport Corporation include, but are not limited to the following:

1. In overseeing the implementation of the project during the construction of the mitigation measures and environmental measures, including the training of these measures into tender documents and contracts, the contractor's organization, the implementation of other environmental management plan, and carry out regular inspections of the construction site.

2. Hire and supervise environmental monitoring consultant (environmental quality monitoring consultants) to conduct environmental monitoring in accordance with the project environmental monitoring programs.

Xi'an Public Transport Corporation 1-2 will be assigned a dedicated environment staff responsible for the overall coordination of the work of Environmental Management Plan implementation. The dedicated environment staff must be familiar with environmental management and environmental regulations, able to understand and implement Environmental Management Plan. Its responsibilities include the following:

1. Ensure compliance with environmental management, Environmental Management Plan and the related regulatory requirements of the project. If you find non-compliance, should take appropriate measures.

2. Keep Xuancheng Economic and Technical Development Zone, supervising engineers and contractors open and smooth communication on environmental issues.
3 To review and approve the contractor's preparation, may cause significant environmental impacts of key project activities' environmental implementation plan.

4 in accordance with the Environmental Management Plan requirements, regular on-site inspections of all construction areas.

5 review and archive all types of contractors and environmental supervision engineers report on environmental management.

6 monthly report to the Economic Development Zone, Xuancheng environmental issues and technical construction site.

- **Contractors**

At any time, the Contractor and its employees should first try to avoid any negative impact of the construction activities of the project, followed should follow the Environmental Management Plan and the mitigation measures specified in the contract, which will damage and its impact on the environment and local communities drop to a minimum.

Remedy not effectively implemented during the construction phase should be completed after the project is completed and implemented before acceptance.

The Contractor shall establish a robust environmental management system to meet the mechanisms, all on-site measures, monitoring, training and reporting requirements.

Chapter 7 contains a detailed environmental norms contractors.

- **Environmental Supervision Engineer (ESE)**

Environmental supervision engineer supervising engineer is an integral part of the functions. Each company will be supervising engineer each contract / working groups assigned at least one environmental supervision engineer. Environmental Supervision Engineer Responsibilities include:

1 review and ensure that the contractor's construction organization plan in terms of compliance with environmental protection and mitigation Environmental Management Plan and the project construction requirements.

2 for the potential environmental impact (if any) of the key project activities, before final approval of the project owner to review each contractor construction site Environmental Implementation Plan and environmental construction plans.

3 to carry out routine site inspections and ensure that the contractor's activities are consistent with environmental management plan and other relevant provisions; When
discovered irregularities or inconsistencies, in the period to instruct the Contractor to take corrective prescribed environmental supervision engineer measures.

4 During the implementation of environmental monitoring and supervision, if necessary, to help Sun City Economic and Technological Development Zone.

5 regular monitoring of the implementation of the environmental management system contractors, including environmental staff, procedures, and reporting; check to make sure environmental supervision procedures, parameters, monitoring, equipment and results. If you find any inconsistencies, the environmental supervision engineers will guide the contractor to take corrective measures, including the replacement of staff capacity building and environmental contractors.

6 Prepare periodic reports and submit to the Environmental Commissioner of Economic and Technological Development Zone, Xuancheng City, review, and archiving.

7 As a supervising engineer, according to Environmental Management Plan approved the implementation of various types of invoices or payments.

● Environmental Quality Monitoring Consultant (EQMC)

To closely monitor the quality of the environment in the project area and to minimize the environmental impact of the construction and operational phases, Xi'an Public Transport Corporation will hire professional consultants to implement environmental monitoring in the environmental assessment phase of the development of the environmental monitoring program. Environmental quality monitoring consultant's responsibilities include:

1 familiar project and the Environmental Management Plan, especially environmental monitoring programs.

2 in accordance with the environmental monitoring plan, and sometimes a professional approach to environmental monitoring.

3. Verify and confirm the results of monitoring guidelines, monitoring equipment, monitoring locations, monitoring procedures and sensitive areas.

4. Timely submission of monitoring results and recommendations to the Sun City Economic and Technological Development Zone.

4.3 Contractor Management

Project contractor is environmental management, pollution control and the impact of the process is a key component of remission. During construction, the Contractor shall permanent
construction site, is mainly responsible for effective control and reduce the impact on the environment. Most environmental measures should be implemented by the Contractor. In order to ensure the implementation of relevant environmental measures and contractors' environmental management plan should take the following measures:

1. In the pre-qualification process, when reviewing the qualifications of the contractor, identified provisions should be included in environmental management. Under the same conditions, priority should be selected through the ISO9000 and ISO14000 certified bidders.

2. In the course of preparation of tender documents, the project owner shall ensure that the Environmental Management Plan is written in the relevant provisions of the mitigation measures and require potential bidders to tender should fully cover the implementation of the Environmental Management Plan budget. Therefore, the implementation of environmental protection measures will be the successful bidder's obligations and responsibilities.

3. Each Contractor shall appoint at least one full-time environmental staff in every segment of the construction project; competency to make this work, the environmental protection commissioner will need to receive environmental training.

4. Before construction, there is a potential for environmental impact (if any) of the key project activities, contractors need to be submitted to the construction site of the Environmental Protection Implementation Plan and environmental construction plans. The plan should be consistent with national environmental regulations as well as environmental management plan requirement contained in the mitigation measures. The plan should provide the following details, such as: Contractor's project management team's commitment to environmental protection; implementation of the project Environmental Management Plan approach, pollution prevention facilities, detailed design and installation (such as drainage, sedimentation tanks, temporary noise screen, etc.); environmental control mechanisms; detailed management plans and site earthworks construction plan (detailed instructions to reduce the maximum limit, mitigate and control the various impacts during the construction methods); environmental monitoring programs in different stages of construction.

5. Before the start, the Contractor shall receive adequate training, Environmental Management Plan and related regulations. Each section/sub-contractors and contractors should at least be assigned a project manager and an environmental engineer training. In addition, environmental supervision engineers should also participate in the training.
5 The environmental impact and mitigation measures

Key findings based on the environmental impact assessment, the following chapter summarizes some prominent environmental impact and mitigation measures. Table 5-1, table 5-2, table 5-3, lists the project's main activities and phases, have been identified the potential environmental impacts and typical mitigation measures, as well as the implementation and monitoring functions. Table 5-4 lists the sensitive area of mitigation measures.

The mitigation measures in accordance with the relevant national laws, regulations, guidelines, standards, and the world bank policy and the environment, health and safety general guidelines and "water and sanitation, health and safety guidelines, in order to solve the design, construction and operation stages) of all kinds of effects. Elaborated in detail in chapter 7 to 10 rules governing the contractor, the emergency plan, the cumulative environmental impact tracking plan, training and capacity building of detailed management plan.
### Table 5-1 construction stage of environmental impact and mitigation measures list

<table>
<thead>
<tr>
<th>Link and elements</th>
<th>Potential impact/issues</th>
<th>Mitigation measures</th>
<th>The environmental management plan/resettlement action plan for reference</th>
<th>implementatio n of the party</th>
<th>Supervisio n party</th>
<th>Monitoring indicators</th>
<th>Monitoring frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social influence</td>
<td>Construction and location improper influence around sensitive, etc</td>
<td>(1) during the engineering design to comprehensive consideration, according to the surrounding environment design, should be further refined permanent plan, reasonable use of land.</td>
<td>Chapter 7 of the environmental management plan</td>
<td>Xi ’an international port district</td>
<td>Xi ’an international port, the world bank</td>
<td>Environmental impact assessment approved by the world bank and the environmental protection bureau of shaanxi province</td>
<td>Assessment before</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) should be attached during construction period people health, in the design of temporary living areas should not be too humble and crowded living conditions, at the same time, should choose the environment better residential area as construction personnel, prevent infectious disease to spread.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3) through public participation know affected by the project construction of the public and the society from all walks of life in front of the project development, the development process and after the development about the environmental problems and affect the views and opinions, so as to further perfect the design of construction projects.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sound environment</td>
<td>On the influence of construction personnel</td>
<td>Due to the building engineering and road engineering construction process, construction noise is bigger, engineering design should be according to the need to take reasonable acoustic noise reduction measures, mitigating the effects of construction noise on site construction personnel.</td>
<td>Chapter 7 of the environmental management plan</td>
<td>Xi ’an harbor area Environmental assessment consultant</td>
<td>Xi ’an harbor district, xian city environmental protection bureau</td>
<td>Environmental impact assessment by the xian city environmental protection bureau for approval</td>
<td>Assessment before</td>
</tr>
<tr>
<td>The impact of traffic noise on the sensitive residents</td>
<td>The atmospheric environment</td>
<td>The influence of the sensitive</td>
<td>Suggest planning department within the scope of the road on both sides of the regulation should no longer build more sensitive;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>----------------------------</td>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| (1) special design green belts on both sides of the road;  
(2) according to the situation of traffic and noise monitoring results to the road on both sides of the sensitive design ventilation and sound insulation window; | Chapter 7 of the environmental management plan | Environmental assessment consultant | Xi'an harbor area, the world bank |
| | | Environmental impact assessment by the world bank and Xi'an environmental protection bureau for approval | Assessment before |
| | Chapter 7 of the environmental management plan | Environmental assessment consultant | Xi'an harbor area, the world bank |
| | Environmental impact assessment by the world bank and Xi'an environmental protection bureau for approval | Assessment before | The impact of traffic noise on the sensitive residents |
Table 5-2 environmental impact and mitigation measures during the construction schedule

<table>
<thead>
<tr>
<th>Link and elements</th>
<th>Potential impact/issues</th>
<th>Mitigation measures</th>
<th>The environmental management plan/resettlement action plan for reference</th>
<th>Implement duties</th>
<th>Monitoring duties</th>
<th>Monitoring indicators</th>
<th>Monitoring frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>The social environment</td>
<td>Transportati on problem</td>
<td>(1) road channel, distributary and temporary channel planning, channel and set up a sufficient number of traffic signs. And should be through radio, television, newspapers and the early advantageous notice; (2) the bridge construction should be strengthened management, especially the structure of construction management, construction should be coordinated with relevant departments, arrange the construction time and the passage of time, vehicle and bridge pier structures such as significant warning lights, alert vehicles safety; (3) the construction of the road should be set up warning lights, to guide the traffic;</td>
<td>Chapter 7 of the environmental management plan</td>
<td>The contractor</td>
<td>Environme ntal supervision engineer</td>
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<td>Before the construction</td>
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<td>The protection of cultural relics</td>
<td>Along according to field investigation, the project does not tie up any surface in the process of construction and operation of cultural relics and grave, construction process, such as the newly discovered underground cultural relics sites, according to the regulations on cultural relics, the construction unit should protect the good scene, rescue and timely notify the cultural relics management department, and ensure the smooth construction of the cultural relics sites security and road</td>
<td>Chapter 7 of the environmental management plan</td>
<td>The contractor</td>
<td>Environme ntal supervision engineer</td>
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<td>Already provide propaganda and training; Cultural relics found record</td>
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<td>Sound environment</td>
<td>The influence of noise during the construction</td>
<td>(1) it is strictly prohibited to high noise and vibration of equipment at noon, or night time to rest, the construction unit should choose low noise equipment or with sound insulation, noise elimination equipment; (2) reasonable arrangements for the construction time, under normal circumstances, the less noise impact on residents’ daily life during the day and at night the noise will affect people's rest. Therefore should pay attention to the reasonable arrangement of construction time, avoid the residents at night</td>
<td>Chapter 6, 7 of the environmental management plan</td>
<td>The contractor</td>
<td>Environme ntal supervision engineer</td>
<td></td>
<td>Already provide propaganda and training; Documented environmen tal</td>
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<td>Link and elements</td>
<td>Potential impact/issues</td>
<td>Mitigation measures</td>
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<td>Implement duties</td>
<td>Monitoring duties</td>
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<td>time to rest within the construction; (3) reasonable arrangements for the construction site, high noise areas should be far away from sensitive, serious influence on individual construction site, take the sound insulation of the temporary retaining structure, also can consider to build temporary workshops in close to sensitive side to replace the effect of sound insulation wall, earthwork should try to arrange multiple devices at the same time, the time of impact. The fixed vibration source is concentrated on the construction site, in order to reduce vibration interference range. In schools, residential areas and other sensitive around before construction, temporary sound barriers and other noise reduction measures should be taken; (4) the construction of the transport vehicle in and out of the ground away from residential areas, schools and other sensitive side; (5) according to the law of the People's Republic of China on prevention and control of environmental noise pollution regulations, if still can not meet the prescribed limit after noise reduction measures, the construction unit should be to the influence of the organization or individual to apologize and give compensation</td>
<td></td>
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<td>monitoring programme</td>
</tr>
<tr>
<td>The surface water environment</td>
<td>The influence of project on the surface water environment</td>
<td>(1) the construction waste water may not be directly discharged into water bodies, after precipitation can be discharged into the municipal sewage pipe network construction waste water or over, the surface runoff discharge of sewage sedimentation tank or the back into the city sewer systems or septic tanks pretreatment with surface runoff discharge, sewage are strictly prohibited during the construction does not handle directly into nearby bodies of water. (2) the objective of the construction units and construction of Chapter 7 of the environmental management plan</td>
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<td>daily</td>
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<tr>
<td>Link and elements</td>
<td>Potential impact/issues</td>
<td>Mitigation measures</td>
<td>The environmental management plan/resetlement action plan for reference</td>
<td>Implement duties</td>
<td>Monitoring duties</td>
<td>Monitoring indicators</td>
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<tr>
<td>The atmospheric environment</td>
<td>The influence of project on atmospheric environment</td>
<td>- slurry water filtering precipitation simple processing, prohibit direct emissions, the construction unit to strengthen management, do civilized construction. (3) for new construction, collection of domestic wastewater and washing wastewater should be concentration, before the drainage pipe network has not laid, the sedimentation tank and septic tank after pretreatment with the surface runoff into nearby bodies of water:In after the completion of the underground drainage pipe network laying, centralized collection of waste water by the pretreatment of sedimentation tank back into the new drainage pipe network, then into the municipal drainage pipe network for processing. (4) for solid waste, construction waste, waste of maintenance, because the experience into the water pollution, so for recycling, classification, storage and processing, the available material, should focus on using or submit a takeover, as most of the attributes of paper, wood, metal and glass, garbage collection available reuse to cannot use, should be properly by the sanitation department for disposal, incineration and landfill, stockpiling, etc. (5) during the construction of the residual oil, waste oil, respectively in different container collection, recycling and disposal;Subgrade construction of application of irrigation water, concrete mixing equipment wash water should be after precipitation post-processing, the waste water as far as possible back to site, sprinkler reduce dust;</td>
<td>The contractor</td>
<td>Environmental supervision engineer</td>
<td>Environmental supervision engineer for on-site</td>
<td>daily</td>
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</tbody>
</table>

Chapter 7 of the environmental management plan
<table>
<thead>
<tr>
<th>Link and elements</th>
<th>Potential impact/issues</th>
<th>Mitigation measures</th>
<th>The environmental management plan/resettlement action plan for reference</th>
<th>Implement duties</th>
<th>Monitoring duties</th>
<th>Monitoring indicators</th>
<th>Monitorimg frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid waste</td>
<td>The influence of the solid waste of the project</td>
<td>(1) road runoff and orderly stacked as planned, avoid to cause disorder and soil and water loss. (2) the living garbage artificial collection to waste transfer station, end up in landfills.</td>
<td>Chapter 7 of the environmental management plan</td>
<td>The contractor</td>
<td>Environmental supervision engineer for on-site supervision</td>
<td>Specifications are followed; Documented environmental monitoring programme</td>
<td>daily</td>
</tr>
</tbody>
</table>

- Prevention and control of water: Backfill earthwork, sprinkling water on surface soil drying should be appropriate, to prevent the dust float in the sky; Windy weather construction is forbidden, and determine the reasonable construction sites;
- 3) strengthen the management to backfill earthwork yards, to formulate the earth surface compaction and water on a regular basis, covering; Don't need soil, abandon slag building materials should be shipped in a timely manner, shoulds not be long time accumulation;
- (4) during the period of construction fully enclosed construction ways should be taken to control the dust pollution, Earthmoving truck and construction material carrier should be in accordance with the provisions, affix a tarpaulin, canopy cover, or other measures to prevent falls, loading shoulds not be too full, ensure that in the process of transportation is not scattered; And planned transport vehicles running route and time, try to avoid in busy areas, such as traffic clusters and residential drive sensitive area; Demanding road to the environment, should choose transport during the night according to actual condition, in order to reduce dust impact on the environment. In the process of transportation on the clay to timely cleaning, on the road to reduce the dust in the process of operation;
### Table 5-3 operational phase of the environmental impact and mitigation measures list

<table>
<thead>
<tr>
<th>Link and elements</th>
<th>Potential impact/issue</th>
<th>Mitigation measures</th>
<th>The environmental management plan/resettlement action plan for reference</th>
<th>Implement duties</th>
<th>Monitoring duties</th>
<th>Monitoring indicators</th>
<th>Monitoring frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound environment</td>
<td>Vehicle noise effects</td>
<td>(1) Enhancing the management in and out of the vehicle parked in and out, try to shorten the idle time of the car, speed limit the factory, a ban on vehicle horns, shorten the car entrance residence time as much as possible to reduce automobile noise and car exhaust and its impact on the surrounding environment. (2) Do a good job of green, the green belts around the factory, peripheral and internal reasonable virulence design. Was formed by stratified greening, grow tall tree species, Joe, irrigation, grass cladding green barrier, can have good noise reduction effect. Can have the effect of natural sound barriers, can have the effect of landscape greening.</td>
<td>Chapter 6 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Specifications are followed; Documented environmental monitoring programme</td>
<td>A month</td>
</tr>
<tr>
<td>Equipment noise effects</td>
<td>(1) To choose low noise equipment; Equipped with sound insulation, shock absorption measures to minimize the production noise (2) The reasonable decorate the location of the noise equipment, keep it away from sensitive</td>
<td>Chapter 6 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Specifications are followed; Documented environmental monitoring programme</td>
<td>A month</td>
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<tr>
<td>The surface water environment</td>
<td>Production wastewater</td>
<td>Project production wastewater after separation tank treatment first, then after multiple effect compound septic tank treatment and sewage into the urban sewage pipe network, to achieve &quot;the Yellow River basin (shaanxi) integrated wastewater discharge standard&quot; (DB61-224-2011) of the secondary standard rear can into the sewage treatment plant.</td>
<td>Chapter 6 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Specifications are followed; Documented environmental monitoring programme</td>
<td>A month</td>
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<tr>
<td>The atmospheric environment</td>
<td>All kinds of fuel loading and unloading machinery and the waste gases coming from work, vehicle traffic into, the outbound vehicle exhaust</td>
<td>Chapter 6 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Specifications are followed; Documented environmental monitoring programme</td>
<td>A month</td>
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<tr>
<td>Paint waste gas produced in spray-paint room, room of the lacquer that bake gas exhaust, of a small amount of the welding smoke produced in welding process</td>
<td>USES dry activated carbon environmental protection equipment, paint fog by harmful substances in the waste gas filter + activated carbon filter layer after the discharge outlets, vent stack height not less than 15 m, to ensure that the air exhaust emissions, reduce the influence of gas on the surrounding environment.</td>
<td>Chapter 6 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Specifications are followed; Documented environmental monitoring programme</td>
<td>A month</td>
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<tr>
<td>Solid waste</td>
<td>The waste parts and waste tires in the process of production</td>
<td>Chapter 7 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Visual inspection; Garbage disposal records; Specifications are followed;</td>
<td>A month</td>
<td></td>
</tr>
<tr>
<td>Waste oil and oil cotton yarn</td>
<td>Set meets the requirements of special waste storage space and storage containers. It is forbidden to mix with other solid waste storage. Should be set respectively waste engine oil, oil cotton waste temporary collection device, such as loading liquid, semi-solid hazardous waste containers for domestic</td>
<td>Chapter 7 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Visual inspection; Garbage disposal records; Specifications are followed;</td>
<td>A month</td>
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<tr>
<td>Risk</td>
<td>Living garbage</td>
<td>Artificial regularly collecting, via a waste transfer station into the landfill</td>
<td>Chapter 7 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Visual inspection; Garbage disposal records; Specifications are followed;</td>
<td>A month</td>
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<tr>
<td>Gas fire explosion</td>
<td></td>
<td>(1) when the project line selection should consider relevant planning, environmental protection and safety. Pipe should be strict accordance with the provisions of the specifications of the various security spacing protection from environmental sensitive and along the pipeline to a certain extent, no larger along the production and storage of toxic chemicals enterprises, prevent once along the pipeline gas leak, fire explosion, poison gas, release and cause secondary pollution. Suggest the project pipeline laying and sensitive environmental safety distance is greater than 20 m (2) the constant air pigging, shut down automatically block valves and other advanced technology and equipment (3) choosing pipeline laying lines, try to avoid landslide, soft soil, the bad engineering area, such as mud-rock flow across the highway, railway, river when the corresponding protective measures are taken, the pipeline rupture accident risk to a Chapter 9 of “environmental management plan”</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
<td>Specifications are followed; Accident record</td>
<td>Every year,</td>
<td></td>
</tr>
<tr>
<td>The social environment</td>
<td>minimum (4) the project must begin from the aspects of management, operation to prevent the happening of the accident, establishing and perfecting the system, and take various measures to set up alarm system, put an end to the accident.</td>
<td>Chapter 11 of the environmental management plan</td>
<td>The owner</td>
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<tr>
<td>Social benefits</td>
<td>projects can effective service &quot;fengwei&quot; the new city and xi 'an city public transport links; (2) links up with the built subway, improve the xi ‘an foreign domestic transportation capacity; (3) project is helpful to improve the state of xi ‘an traffic; (4) the construction of the project implementation has a positive impact on the development of xi ‘an city; (5) project to solve the problem of regional population travel; (6)projects to improve the regional infrastructure and speed up the urbanization process has a promoting effect; (7)project is beneficial to enhance the vitality of the city, improve the image of the xi ‘an tourism city (8)The project is helpful to promote the development of regional real estate market.</td>
<td>Chapter 11 of the environmental management plan</td>
<td>The owner</td>
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<tr>
<td>Whether the public participation in environmental monitoring</td>
<td>Three people in the community environment watchdog group, monitoring project environmental conditions in the operating period.</td>
<td>Chapter 11 of the environmental management plan</td>
<td>The owner</td>
<td>Harbor district environmental protection bureau</td>
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<tr>
<td>The cumulative environmental impact</td>
<td>Project development on the surface water environment, air environment, acoustic environment and the ecological environment influence; Has set up a base in planning environmental assessment report lists the cumulative impact of solution; Xi ‘an public transport corporation adopted the best management practices (BMP);</td>
<td>&quot;Environmenta l management plan&quot; chapter 10</td>
<td>The owner</td>
<td>Xi ‘an environmental protection bureau</td>
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<td>The standard</td>
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6 Supervision and monitoring plans

6.1 Environmental Supervision

Supervising engineer is responsible for inspection, monitoring and review of all construction activities to ensure that the Environmental Management Plan in the various mitigation measures are properly implemented, and the negative impact of the project on the environment is reduced to a minimum. Supervising engineer companies need to specify an environmental supervision engineer, contractor to be responsible for the implementation of the environmental mitigation measures daily site supervision.

The key responsibilities of environmental supervision engineers include:

6.1.1 Phase I: Prepare

The first phase aims to lay the foundation for the successful implementation of the project. At this stage, environmental supervision engineers

• Review of Environmental Impact Assessment Report, Environmental Management Plan, project design and technical specifications, and verify mitigation measures in the absence of any significant omissions;

• Prepare the relevant guidelines for the implementation of the Environmental Management Plan contractor;

• Develop and implement one pair for all parties involved in construction activities for training programs.

The main tasks of the first stage:

• Review project file: environmental supervision engineers will examine environmental impact assessment, Environmental Management Plan, project design and technical specifications, and confirmed in writing mitigation measures that do not exist any significant omissions. If you find any problem, environmental supervision engineer should advise the Project Management Office (PMO) on Environmental Management Plan, design and technical
specifications to be updated to address these issues. Once approved by the PMO, environmental supervision engineers will update the Environmental Management Plan.

- Environmental Management Engineer will review and approve the Environmental Management Plan implementation plan submitted by the Contractor.

- Environmental Supervision Checklist: environmental supervision engineers will produce a comprehensive checklist for contractors during the construction project supervision. The checklist will cover the main aspects of the project, the necessary mitigation / control measures and their implementation arrangements.

- Logbook: environmental supervision engineers will prepare a work log records that may affect the environmental impact assessment or may not lead to conform with changes in environmental supervision engineers to rectify non-compliance of the recommendations of the various status or condition.

- Environmental Training: environmental supervision engineers should design and implement a comprehensive training program to train project involved parties, including the supervising engineer, project office staff, safety and environmental authorities contractor, the contractor's workers, and so on. The training includes environmental requirements of the project and how they are monitored and reviewed, in particular the following aspects:

- Environmental Supervision should cover Environmental Management Plan requirements, agreed environmental monitoring checklist, environmental monitoring table, Environmental Management Plan treatment non-compliance, as well as all other key issues. Contractors should pay particular attention to the technical specifications of each specific provisions on how to follow the Environmental Management Plan.

- Health and safety: health and safety requirements should be clearly projects and communicate with contractors and PMO.

- At the end of training, the contractor will also sign a declaration confirming their understanding of the relevant environmental regulations, "Environmental Management Plan" compliance framework and health and safety obligations. Environmental supervision should sign
a similar declaration confirming their understanding of their oversight responsibilities. These statements should be submitted to the PMO and the World Bank.

6.1.2 Second stage: construction supervision activities

- An independent, objective and professional manner to review and check the "Environmental Management Plan" to implement various aspects.

- For safety record compiled by environmental authorities and contractors random inspection and review.

  - regularly carry out on-site inspections.

- Review of the implementation of environmental protection measures in accordance with the state, "Environmental Management Plan" and the contract documents. Significant violations will result in downtime contractors and other punishment until the irregularities make environmental supervision engineers get a satisfactory solution.

  - Check whether the contractor regulations and other environmental, public health and safety are met.

  - Review the effectiveness of environmental mitigation measures and project environmental performance.

- Review construction method (temporary and permanent works), relevant design plans and submissions in environmental acceptability; when necessary, environmental supervision engineer with designers, contractors and project office consultations to find and recommend to the environment minimal impact alternatives.

  - Verify that the environmental quality of any non-compliance findings, as well as the effectiveness of corrective measures.

  - According to "Environmental Management Plan" in the non-compliance procedures, periodically review the results back to the PMO and CST.

  - At least once every six months to provide training, every time a new workers or new contractor should also provide training for admission. The training should include
"Environmental Management Plan" requirements, prohibited items, regulatory compliance, and environmental awareness.

• Regular monitoring of contractor performance and environmental engineers monitoring methods and results are verified. When considered safety and environmental authorities or any member of the team's failure to perform duties or comply with the contract requirements, environmental supervision engineer should require the contractor to replace the safety and environmental authorities and his team members.

• When the violation or complaint, in accordance with the contract requirements and related procedures, require the contractor to take corrective action within a specified time, and when needed to carry out the additional supervision.

• When irregularities / inconsistent findings require the contractor to take measures to mitigate the impact and follow the provisions of the "Environmental Management Plan" program.

• When the adverse effects of certain activities and / or when the Contractor fails to implement "environmental management plan" requirements / remedial measures to require the contractor to stop these activities.

• Environmental supervising engineer should ensure compliance with the contract documents in terms of health and safety requirements.

• Environmental supervising engineer should visit and visual inspection to detect the presence of potential environmental problem areas, and take to implement a regular on-site inspections to strict supervision of the construction activities through daily live. Check the area should cover the construction area and the surrounding environment, directly or indirectly contractor activities in the affected area.

• Environmental supervising engineer should bring their own handheld or portable monitoring equipment, such as cameras, vehicles and other resources. When the need for additional oversight activities to resolve contentious issues or punishment, environmental supervision engineers can work with third-party contracted to carry out the monitoring location being examined.
• When violations of technical specifications or contract terms, or do not follow the 
"Environmental Management Plan", environmental safety and environmental supervision 
engineer notify the contractor in charge immediately. Environmental supervision engineers of all 
irregularities should be reported to the PMO, as part of its monthly reporting responsibilities.

• Environmental supervising engineer in charge of environmental and safety should be a 
contractor regularly organized (such as weekly) combined with on-site environmental inspection. 
Environmental supervision engineers should use this opportunity to further training of staff contractors.

• Environmental Supervision Engineer shall maintain on-site work logs, ready for inspection 
by all persons involved in the project management.

• Environmental supervising engineer should also periodically review the contractor's 
records to ensure that it kept up to date, in line with the actual situation and to meet the 
"Environmental Management Plan" reporting requirements (such as environmental complaints 
register).

• Contractor's site office will receive all kinds of complaints. Environmental Supervision 
Engineer shall provide a copy of such complaints, and environmental supervision engineer 
should be recognized during the on-site inspection in accordance with the Contractor has been 
found to be the same solution to the problem properly addressed.

• When the discovery of the "Environmental Management Plan" or "environmental impact 
assessment" in the event of unforeseen environmental supervision engineers should work closely 
with the contractor and the project office and confirmed the event to get a satisfactory solution. 
Environmental supervision engineers to deal with "environmental management plan" to update 
and implement guidelines and training of staff accordingly contractors.

• For environmental supervision engineers recommend to clients related to environmental 
protection, environmental supervision engineer should confirm their monthly payments.

• Environmental supervision engineer at least a written report should be prepared by the 
following:
• Weekly issues related violations;

• Key issues covered in the review and supervision of monthly summary found;

• Monthly consolidated report of the contractor.

• Environmental supervision engineers should also collect and report information required by the PMO.

• At the end of the project, environmental supervision engineer should prepare a summary of all of its work found that the number of violations, the final report to resolve the situation, etc., and provides information on how to carry out such work in the future should the recommendations and guidelines.

• During the project implementation, environmental supervision engineer should provide the PMO, the environmental protection department and requested the World Bank, the project progress, events and other presentations, and environmental issues related to the management and supervision. These presentations should be submitted at least once every six months.

### 6.2 Environmental Quality Monitoring Plan

Environmental monitoring project implementation phase shall be commissioned by the owners of the environmental quality monitoring consultants (usually Environmental Monitoring Station) to execute. Environmental monitoring consultants will periodically collect environmental samples at selected locations (including air, noise, etc.). The results of such monitoring, reviewing and sampling results shall be submitted to the proponent, and constitutes all kinds of indicators to determine whether the project meets environmental regulations.

Environmental Management Plan in the monitoring plan should focus on the following key points:

• The project owner is committed to implementing all kinds of monitoring programs and related projects.
• Might be expected to give the environmental and social impacts of the project area resources will be subject to monitoring, including air quality, noise, water quality, soil quality, and socioeconomic resources.

• Regular monitoring of the owners of various types of data to carry out trend analysis monitoring program to assess the success of the monitoring program, but also through the analysis clear whether the monitoring programs need to be changed or adjusted.

• When necessary, in cooperation with environmental authorities designed the latest monitoring programs.

Based on the evaluation of environmental impact, it was confirmed under normal circumstances, will affect the period of the specific items in the environment surrounding the embodiment. Generally, these effects can be mitigated through various environmental measures. The comprehensive monitoring programs and assessment programs are listed in the Environmental Management Plan.

In order to test the effectiveness of mitigation measures, monitoring is needed to confirm the effectiveness of mitigation measures within a reasonable timeframe. During the monitoring period must be determined that the target environment parameters and baseline data, and Environmental Impact Assessment Section 1.4, the law or standards set forth for comparison.

6.2.1 Introduction monitoring procedures

In the design of monitoring programs and monitoring frequency should quantify the overall environmental performance of the Project and any short-term impact of the intensive construction activities caused. Specifically, as a key component of "Environmental Management Plan", the environmental monitoring plan shall contain the following objectives:

• Predicted environmental impact assessment during the confirmation process, Environmental Management Plan to develop and monitor the effects.

• Determine the types and extent of the actual extent of the impact.

• Assess the effectiveness of mitigation measures.
Against accidental impacts during project implementation, identify and adjust any additional mitigation measures.

Under any new regulatory standards, track and update the environmental quality monitoring methods and objectives of the project.

During peak construction or at the request of the environmental monitoring consultant will conduct additional monitoring to monitor the short-term impact. If you find that the performance of non-compliance with environmental quality standards, it shall conduct additional monitoring.

6.2.2 Monitoring parameters

<table>
<thead>
<tr>
<th>Monitoring elements</th>
<th>Monitoring points (sections)</th>
<th>indicators</th>
<th>Monitoring frequency</th>
<th>Implement duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>The water quality</td>
<td>Camp, construction site, construction yard</td>
<td>The SS and oil</td>
<td>Once a quarter</td>
<td>Environmenta l quality consultants</td>
</tr>
<tr>
<td>Air quality</td>
<td>Equipment operation site there is a lot of homework, sensitive areas or sensitive environment near the shop or clearing roads,</td>
<td>PM₁₀</td>
<td>In the construction peak of random sampling</td>
<td>Environmenta l quality consultants</td>
</tr>
<tr>
<td>noise</td>
<td>Equipment operation site there is a lot of homework, sensitive areas or sensitive environment near the shop or clearing roads,</td>
<td>The equivalent continuous sound level (Lₐₑₐ₉)</td>
<td>In the construction peak of random sampling</td>
<td>Environmenta l quality consultants</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitoring elements</th>
<th>Monitoring points (sections)</th>
<th>indicators</th>
<th>Monitoring frequency</th>
<th>Implement duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>sewage</td>
<td>Downstream of the sewage outfall</td>
<td>COD、BOD₅、SS、Ammonia nitrogen</td>
<td>1 time every year</td>
<td>Routine monitoring by the competent department of environmental protection</td>
</tr>
<tr>
<td>Waste gas</td>
<td>The outside of the vent</td>
<td>THC、CO、Paint fog、NOₓ</td>
<td>1 time every year</td>
<td>Routine monitoring by the competent department of environmental protection</td>
</tr>
<tr>
<td>Production of noise</td>
<td>1 meter to the high noise source</td>
<td>The equivalent continuous sound level (Lₐₑₐ₉)</td>
<td>1 times per quarter</td>
<td>Routine monitoring by the competent department of environmental protection</td>
</tr>
<tr>
<td>Social environmental noise</td>
<td>within office area and around the border</td>
<td>The equivalent continuous sound level ($L_{Aeq}$)</td>
<td>1 times per quarter</td>
<td>Routine monitoring by the competent department of environmental protection</td>
</tr>
</tbody>
</table>
7 Contractor environmental specifications

Insurers environmental norms offers a range of guidelines, processes and procedures to ensure the ecological environment is not affected by the project contractor during the implementation of the activities. The Contractor shall follow the guidelines identified in the document. Environmental issues in general and contractor activities include:

• On-site management

• Fuel and materials storage and handling

• Dust and Noise Hazard Control

• Wastewater Management

• Waste Management

Environmental issues and specific project-related activities (such as soil and water conservation plans, contingency plans, etc.) described in detail later chapters.

7.1 contractor Environmental Protection Plan

Contractor are required to hold Environmental Management Plan copies, and the words Environmental Management Plan incorporated into the tender documents. Before construction began, the Contractor shall submit a construction site for its job environmental program for environmental supervision engineers, management consultants and owners of the external environment review. The environmental protection plan should cover generic environmental impact mitigation measures (as well as specific mitigation measures for emergency response, etc.), including (but not limited to) the following:

• Construction of the total plan, indicating the work area, fuel storage and refueling areas, parking, equipment maintenance areas, material storage areas and camp area;

• Waste Management Plan;

• Dust Control Plan;

• Noise Control Plan;
7.2 on-site facilities

Ensure that construction camps and peripheral industries at a distance. Environmental supervision engineer responsible for the production and approval of construction activity plan.

7.2.1 labor hire

• If appropriate, priority should be to hire local labor.

• The Contractor shall publish its towns and villages in the base of each job position.

• Construction and legal staff should have employment contracts.

• The Contractor shall provide the education and training of construction workers, environmental protection and occupational health and safety.

7.2.2 requires construction camp

• The Contractor shall provide a safe construction workers suitable accommodation.

• Construction camp were men and women workers should be independent and well equipped bathing facilities (toilets and the bathroom). Toilet water should be sufficient, and with soap and toilet paper. All of these facilities require clean, ready for use. Toilets should be marked "male", "female."

• Construction camp kitchen should have clean water and good health.

• Camp sewage may not be discharged directly into any waters, should at least be treated by septic tanks.

• Construction camp should provide emergency medical facilities. Camp shall provide first aid equipment and sent people management. First aid personnel should receive a complete first-aid training and obtain the appropriate qualifications, the injured or the patient can go to a local hospital timely and appropriate manner. More health facilities once used should be promptly added.

7.3 Code of conduct
Construction workers should be established Code of Conduct, emphasizing appropriate behavior, drug and alcohol abuse is strictly prohibited and follow the relevant laws and regulations, thus reducing the impact on the community. Code of Conduct propaganda notification should be implemented to every worker. Construction worker code of conduct should be notified to the local community. Failure to comply with Code of Conduct, shall be subject to disciplinary action. Code of Conduct includes but is not limited to the following measures:

- All staff shall comply with national laws and regulations;
- Dangerous goods and hazardous site is prohibited weapons;
- The site is prohibited pornographic materials and gambling activities;
- Do fights;
- Do not obstruct the immediate vicinity and the local people 's life and production;
- Respect local traditional culture, customs and traditional activities;
- Designated areas only smoking;
- Proper dress and personal hygiene standards;
- Suitable accommodation sanitation;
- When you visit the neighborhood and the local people, should comply with the relevant code of conduct.

### Prohibited acts

Prohibit the construction site and the surrounding occurrence of the following acts:

- Harm wildlife and livestock villagers adjacent areas;
- Capture the protection of animals or picking protected plants;
- Buy food protection of animals;
• affect or destroy objects of historic or architectural value;

• Outdoor lights the fire;

• Working hours drinking;

• mechanical maintenance (oil and lubricant supply) outside the designated area;

• outside the area designated dumping;

• Local roads dangerous driving;

• The construction of the dress is not secure (such as: safety boots and helmets);

• impact on nearby residents;

• leakage of pollutants, such as: Oil;

• Incineration.

Any contractor, office staff or other staff, if found in violation of the above rules, depending on its severity should be released verbal criticism to disciplinary labor contracts.

7.4 Health and Safety

• The Contractor shall ensure that the project complies with all national and local safety regulations and other measures to avoid damage ;

• Before construction, the Contractor shall worker safety training ;

• There should be sufficient daylight and nighttime lighting ;

• construction fence around the site should be anti-interference, and the construction of its inspection and maintenance ;

• Contractor management personnel without the approval of unauthorized persons can not enter the construction camp ;

• Construction camps shall be equipped with fire extinguishers and other fire fighting equipment ;
• The Contractor shall provide adequate protection for the personal safety of construction workers (for example: goggles, protective gloves, protective masks, dust cover, helmet, ear protectors, helmets, etc.) and ensure that it is used at the construction site;

• safety procedures, emergency plans and emergency contact information, etc. should express at the construction site bulletin board;

• All dangerous place that may occur should be warned express;

• safety distance shall be determined in accordance with the relevant provisions;

• The Contractor shall take all reasonable measures to prevent risks and ensure that all construction sites and camps have been providing fire protection equipment;

• no need of fire engineering, the environment can only be approved by the supervising engineer to by its oversight be required. Meanwhile, the corresponding fire-fighting equipment should be arranged in place;

• The Contractor shall provide an annual physical examination as construction workers;

• The Contractor shall also provide training in basic personal hygiene and epidemic prevention, including respiratory and infectious diseases;

• The Contractor shall carry out the prevention and treatment of diseases related to educational activities (especially protective AIDS and sexually transmitted diseases), including the construction site and adjacent areas in the form of notices and training courses for publicity;

• The Contractor shall provide basic first aid services and emergency measures for the construction workers;

• The Contractor shall road near the construction of local communities (if any) to establish the necessary warnings and road deceleration device, to ensure the traffic safety of nearby residents.

7.5 fuel storage, oil and hazardous toxic substances
• All fuel storage construction site should be fenced; storage area should be 110% of the fuel storage container. Fuel storage area should not be near any water source (ie: from the water within 100 meters);

• Hazardous materials should be stored in the storage device explicitly specified. Such as fuel, oil and paint and other dangerous items should also develop temporary storage requirements.

• The storage area is limited to the persons concerned before entering;

• The point should also be stored in the vehicle from damage, and regularly check for leaks, damage and contamination;

• Machinery and equipment maintenance is limited to be within the scope of the contractor camp. Operating surface (ie, within the fenced area of the concrete floor) must be designed properly to ensure that oil and other fuel can concentrate to a suitable container. In the event of oil/fuel leaks, remove contaminated soil is required to properly licensed locations for processing;

• To prevent grease, oils, fuels, solvents and chemicals for water and soil erosion caused by pollution or must always adopt appropriate preventive measures;

7.6 Waste Management

• During construction, the contractor will be required to adopt an appropriate manner at all times to clear the waste site to a licensed waste disposal facilities. Construction waste should minimize the accumulation of circumstances.

• Contractor camp activities all garbage must be placed in the trash (210L steel or plastic drums) or garbage dump car. Contractor shall ensure that once a week or emptied the trash container when needed.

• All trash should be immediately placed in the trash or garbage dump car. Work area or contractors shall not littering the camp.
• Construction waste shall be kept at the camp contractors, the Contractor is responsible for handling. Construction of contaminated waste must be dealt with separately.

• Construction site prohibit the incineration of waste.

7.7 wastewater and storm water management

• the construction site and camp wastewater directly discharged into surface water bodies shall be;

Before being discharged after:

• subject to proper sewage treatment (e.g., septic tanks).

• the need to implement storm water discharged into the river before the determination of energy dissipation;

• the construction site (temporary drainage facilities) discharge of storm water runoff should be evenly distributed as possible; and

Using gabion, ripples bed with low-lying land by reducing the flow rate of water in the buffer.

7.8 Noise Control

• Limit construction time during the day;

• Construction weekend approaching local communities, they should ensure that no noise activities;

• site staff, visitors and construction workers, personnel must be equipped with proper hearing protection measures to avoid the effects of noise on hearing harm;

• environmental supervision engineer must carry out regular site inspections to ensure compliance with "occupational health and safety."

7.9 Construction Phase communication with the public information

Community (public) participation and complaint registration (CR)
• During construction, the Contractor shall remain with the local government and people in the community about the open communication;

• Before construction, the contractor shall be in the form of community meetings to affected parties (such as: local government, businesses and residents) published project information;

• Each construction site shall be prominently labeled information about the project, including, but not limited to:
  a) Project Overview;
  b) construction plans;
  c) The main construction activities;
  d) The main environmental issues and mitigation measures;
  e) project managers, engineers and environmental officers supervising the name, telephone, etc.

• Contractors and environmental supervision engineers should regularly communicate with the main sensitive receptors to minimize its adverse impact;

• All contractor should be provided to workers on the surrounding relationship maintenance, communication, training of local customs and codes of conduct;

• channels for complaints related information shall be published on the site at the entrance;

• Main construction site shall be provided to the office to register a complaint. All complaints, problems and related issues should be included in the feedback report, by environmental supervision engineers and city Economic Development Zone declared technical review;

• The need to correct the handling of complaints must be communicated to the parties concerned to ensure that the complainant satisfied.

7.10 Physical Cultural Resources
• aims to educate workers about the historical relics and historical artifacts found in the training and protection program.

• if found resources;

  a) The Contractor shall immediately stop the construction, protection of the site;

  b) reporting environment supervising engineer with the owners and the local authorities and cultural resources;

  c) During the investigation of local authorities, the Contractor shall take appropriate measures to protect the historical heritage site, and the implementation of preventive measures weather;

  d) Only after authorities agreed, the contractor may recover the construction.
8 Emergency plan

8.1 Contingency Plan

After the project put into various pipelines, in the case of normal operation, no adverse effects on the environment, but in the following cases: natural gas drilling gas pipeline due to criminals stealing gas, above the illegal construction of the pipeline, the pipeline of internal and external corrosion, pipeline quality defects, construction defects and floods, landslides, earthquakes and other natural disasters caused the pipeline rupture, causing a natural gas leak, fire source might be a fire, explosion.

For this project, the owners need to develop emergency response procedures related, including: emergency command structure and related responsibilities and tasks cooperative unit, select technology and handling emergency procedures, equipment, equipment configuration and layout, human and material resources to ensure and deployment, dynamic monitoring system of the accident, after the accident reporting system.

8.2 City gas accident prevention measures

① strict control of natural temperament, a regular pigging, excluding water and dirt inside the tube in order to reduce corrosion of the pipeline;

② pipe wall thickness measurements every three years, severe thinning of the pipe wall, timely maintenance and replacement, burst pipes to avoid accidents;

③ pipeline safety inspection every six months protection systems (such as shut-off valve, safety valve, venting systems, etc.), so that the pipe can be overpressure in the safe handling, so that the scope of damage is reduced to a minimum.

④ in rail, road, river crossing point mark not only clear, unambiguous, and its setting should be from different directions and different angles can see;

⑤ increasing frequency transmission line, improve the effectiveness of the transmission line; checked daily with pipeline construction, check surface conditions, and are concerned about the activities of this zone personnel found to influence the behavior of pipeline safety, it is timely to stop, take appropriate measures report to superiors;
⑥ for crossing rivers and other sensitive areas of the pipe should be inspected once every three years;

⑦ in the flood period, special attention should be safe section of the pipeline crossing the river;

⑧ distribution stations venting accident, should pay attention to the fire.

8.3 Strategies sudden accident and emergency programs

Plant maintenance during operation, once sudden accident occurs, the program must be prepared in advance, and for emergency treatment. Content emergency plan are as follows:

(1) General insurance source

Syria risks detailed source type, source of small and powerful position.

(2) emergency response organizations

Emergency group is responsible for the overall command of the scene, professional repair team is responsible for the accident or fault repair or excluded.

(3) emergency facilities, equipment and materials

With related spare equipment, tools and materials.

(4) emergency communications, notifications and traffic

Contact communication requirements under the state of emergency, notify all interested parties, control the scene of the accident to determine the repair teams arrive.

(5) Emergency protective measures

Control accidents, and prevent the expansion of the chain reaction; closure of the gate, enable accident pools, harm reduction.

(6) the termination of the emergency situation and recovery measures

State of emergency provisions to terminate the program, dealing with the aftermath scene of the accident, quickly returned to normal operation.

(7) emergency environmental monitoring and assessment after the accident
For larger scene of the accident near the water environment monitoring, the nature of the accident, the parameters and consequences assessed to provide a basis for decision-making authorities.

(8) personnel training and exercises

After formulating contingency plans, usually arrangements for staff training and exercises.

(9) Records and reports

Set accidents specially recorded files and accident reporting system established to set up a full-time or part-time staff responsible for the management.
9 Environmental training and capacity planning

9.1 Construction training

In west of xi’an bus maintenance factory before any activity, the project got fully training all employees. Training objects include Development zone of environmental management personnel, environmental supervision engineers and contractors.

9.1.1 Recruits and environmental supervision engineer training

Environmental supervision engineer and recruits training purpose is to strengthen the environmental management of construction and operation stages, to ensure the effectiveness of environmental management, to improve the overall quality of the project. Through training, supervision engineers, and environmental management to identify the main environmental problems and defects in environmental management, and the contractor shall take necessary preventive measures as soon as possible. During construction, the development zone will be invited to have a similar experience of environmental consultant (environmental experts or institutions) for site training for potential problems and corresponding solutions.

9.1.2 The contractor’s training

Staff personnel before construction, environment and the winning bidder shall accept environmental supervision engineer and development management team to provide system environment knowledge training, in order to avoid the wrong operation cause environmental damage. Contractor personnel training environment is to determine the construction unit of the environmental management responsibility, the staff training process is correct operation method during the period of construction, in order to reduce or avoid unnecessary loss. Through training, the contractor shall know the responsibility of environmental protection responsibility and may lead to destruction of the environment as a result, the staff can clearly understand the protection method and the degree of environmental sensitive, staff training should be for a week, depending on the actual situation.

Training plan and budget as shown in table 9.1 1.
### Table 9.1 Environmental protection training plan

<table>
<thead>
<tr>
<th>Serial number</th>
<th>Trainees</th>
<th>Content</th>
<th>Organize place</th>
<th>Participants</th>
<th>Time limit</th>
<th>Place</th>
<th>Budget (RMB ten thousand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hired personnel, environment supervision engineer</td>
<td>Learning environment protect and manage intellectual environment management measures</td>
<td>The port area</td>
<td>3</td>
<td>5 days</td>
<td>Xi’an</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Harbor district environmental protection personnel</td>
<td>A visit to focus on infrastructure projects of environmental protection</td>
<td>The port area</td>
<td>3</td>
<td>5 days</td>
<td>To be determined</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Environmental supervision engineer</td>
<td>The relevant provisions, &quot;Environmental management plan&quot; requirement, emergency plan</td>
<td>The port area</td>
<td>10</td>
<td>Ten days</td>
<td>Xi’an</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>The main technical head of the contractor, The construction director</td>
<td>The relevant provisions, &quot;Environmental management plan&quot; requirement, emergency plan</td>
<td>The port area</td>
<td>30</td>
<td>Ten days</td>
<td>Xi’an</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Construction team and operation team</td>
<td>The relevant provisions, &quot;Environmental management plan&quot; requirement, emergency plan</td>
<td>The port area</td>
<td>20</td>
<td>3 days</td>
<td>Xi’an</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>12</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10 Environmental protection investment

Construction and operation period of the environmental management plan for the implementation of the budget, as shown in table 10-1. Environmental investment budget including environmental mitigation measures, environmental protection monitoring and engineering management and major projects, and slow or eliminate the negative impact on the environment of investment. Note that many of the mitigation measures management practices are the properties of its budget will be included in the overall contract, may not be specific.

<table>
<thead>
<tr>
<th>project</th>
<th>content</th>
<th>Investment (ten thousand yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste gas treatment</td>
<td>Bottom filter cotton and activated carbon adsorption systems</td>
<td>26.0</td>
</tr>
<tr>
<td></td>
<td>Welding gas bag dust collector</td>
<td>12.0</td>
</tr>
<tr>
<td></td>
<td>The canteen lampblack processor</td>
<td>2.0</td>
</tr>
<tr>
<td>Wastewater treatment</td>
<td>Canteen waste water separation tank and septic tank (40 m³)</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>Separation tank (3×9 m³)</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Settling basin (6×2 m³)</td>
<td>6.0</td>
</tr>
<tr>
<td>Noise control</td>
<td>Equipment noise reduction, sound insulation, shock absorption base, etc</td>
<td>15.0</td>
</tr>
<tr>
<td>Solid waste disposal</td>
<td>Waste temporary place for surface hardening, anti-seepage leakage prevention measures</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>Waste collection, staging, pickup system</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>Life garbage collection and pickup</td>
<td>2.0</td>
</tr>
<tr>
<td>Refueling stations pollution prevention</td>
<td>Proposed using glass fiber reinforced plastic anti-corrosion seepage control technology; Of the oil tank inside and outside surface, The inner surface of the oil jetty, oil tank area on the ground, outside the pipeline surface do &quot;six glue two cloth&quot; anti-seepage anticorrosive processing: Around the underground storage tanks design leakage inspection hole or tunnel</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Gas oil and gas recovery system</td>
<td>5.0</td>
</tr>
<tr>
<td>other</td>
<td>greening</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>The accident pool 50m³</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>subtotal</td>
<td>119.2</td>
</tr>
</tbody>
</table>