



**WORLD BANK LOAN GANSU TECHNICAL AND
VOCATIONAL EDUCATION AND TRAINING PROJECT**

**Environmental and Social
Management Plan**

**World Bank Loan Gansu Technical and Vocational Education
and Training Project Office**

Lanzhou University Applied Technology Research Institute Co., Ltd.

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Contents

1. INTRODUCTION	1
1.1 PROJECT BACKGROUND	1
1.2 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN	3
1.3 DEVELOPMENT OF EMP	4
2. POLICY AND LEGAL FRAMEWORK	6
2.1 ENVIRONMENTAL PROTECTION LAWS	6
2.2 BYLAWS, REGULATIONS AND NORMATIVE DOCUMENTS ON ENVIRONMENTAL PROTECTION	6
2.3 TECHNICAL GUIDELINES ON ENVIRONMENTAL PROTECTION.....	7
2.4 WORLD BANK SAFEGUARD POLICIES AND ENVIRONMENT, HEALTH AND SAFETY (EHS) GUIDELINES	7
2.5 RELEVANT WORLD BANK POLICIES ON EPIDEMIC PREVENTION AND CONTROL	10
2.6 OTHER RELEVANT DOCUMENTS.....	10
2.7 ENVIRONMENTAL FUNCTION ZONE PLANNING AND ASSESSMENT STANDARDS.....	10
3. PROJECT OVERVIEW	17
3.1 INTRODUCTION OF PROJECT AREA.....	17
3.2 TVET OVERVIEW	19
3.3 PROJECT DEVELOPMENT OBJECTIVES.....	23
3.4 PROJECT COMPONENTS	23
4. ENVIRONMENTAL STATUS & SENSITIVE POINT SURVEY.....	40
4.1 CHARACTERISTICS OF THE PROJECT'S SURROUNDING ENVIRONMENT	40
4.2 ENVIRONMENTAL PROTECTION OBJECTS	47
5. IMPACT ANALYSIS & MITIGATION MEASURES	53
5.1 ENVIRONMENTAL IMPACT ANALYSIS AND MITIGATION MEASURES IN THE CONSTRUCTION PERIOD.....	53
5.2 ENVIRONMENTAL IMPACT ANALYSIS AND MITIGATION MEASURES IN THE OPERATION PERIOD	96
5.3 DUE DILIGENCE	103
5.4 SOCIAL IMPACT ANALYSIS.....	105
6. ENVIRONMENTAL MANAGEMENT SYSTEM.....	114
6.1 CONFIGURATION OF ENVIRONMENTAL MANAGEMENT AGENCIES	114
6.2 RESPONSIBILITIES AND STAFFING OF AGENCIES INVOLVED IN THE ENVIRONMENTAL MANAGEMENT SYSTEM.....	116
6.3 ENVIRONMENTAL MANAGEMENT TASKS IN DIFFERENT PERIODS OF THE PROJECT	118
6.4 ENVIRONMENTAL SUPERVISION	120
6.5 ENVIRONMENTAL MANAGEMENT TRAINING	122

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

6.6 PUBLIC GRIEVANCE REDRESS AND FEEDBACK MECHANISMS.....	124
7.ENVIRONMENTAL MANAGEMENT PLAN.....	128
7.1GENERAL IMPACTS AND MITIGATION MEASURES IN THE CONSTRUCTION PERIOD.....	128
7.2 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES FOR SPECIFIC SITES IN THE CONSTRUCTION PERIOD.....	150
7.3 GENERAL ENVIRONMENTAL CODES OF PRACTICES IN THE OPERATION PERIOD.....	164
7.4 ENVIRONMENTAL CODES OF PRACTICES FOR SPECIFIC SITES IN THE OPERATION PERIOD.....	166
7.5 SUMMARY OF ENVIRONMENTAL CODES OF PRACTICES.....	168
8. ENVIRONMENTAL MONITORING PLAN.....	195
8.1 MONITORING OBJECTIVES AND PRINCIPLES.....	195
8.2 MONITORING AGENCY.....	196
8.3 ENVIRONMENTAL MONITORING PLAN.....	196
9. EMP INFORMATION MANAGEMENT.....	199
9.1 INFORMATION EXCHANGE.....	199
9.2 RECORDING MECHANISM.....	199
9.3 REPORTING MECHANISM.....	199
9.4 FILE MANAGEMENT.....	200
10. COST ESTIMATION.....	203
10.1 ENVIRONMENTAL PROTECTION INVESTMENT ESTIMATION FOR GANSU VOCATIONAL COLLEGE OF ENERGY AND CHEMICAL.....	203
10.2 ENVIRONMENTAL PROTECTION INVESTMENT ESTIMATION FOR GANSU FINANCE AND TRADE VOCATIONAL COLLEGE.....	204
10.3ENVIRONMENTAL PROTECTION INVESTMENT ESTIMATION FOR GANSU SENIOR TECHNICAL SCHOOL OF MECHANICS.....	205
10.4ENVIRONMENTAL PROTECTION INVESTMENT ESTIMATION FOR LANZHOU UNIVERSITY OF ARTS AND SCIENCE.....	206
10.5 SUMMARY OF ENVIRONMENTAL MANAGEMENT COST.....	207
11. PUBLIC PARTICIPATION AND INFORMATION DISCLOSURE.....	209
11.1 OBJECTIVES OF PUBLIC PARTICIPATION & INFORMATION DISCLOSURE.....	209
11.2 IDENTIFICATION OF STAKEHOLDERS.....	210
11.3 METHODS AND CONTENTS OF PUBLIC PARTICIPATION.....	212
11.4 PUBLIC OPINIONS AND SUGGESTIONS.....	213
11.5 INFORMATION DISCLOSURE AND FEEDBACKS.....	234
11.6 CONCLUSIONS AND RECOMMENDATIONS OF PUBLIC PARTICIPATION.....	258
12. SUMMARY.....	259
12.1 PROJECT CONSTRUCTION COMPONENTS.....	259
12.2 CONCLUSIONS OF ENVIRONMENTAL ANALYSIS OF THE PROJECT.....	259
12.3 CONCLUSIONS OF ENVIRONMENTAL IMPACT MITIGATION MEASURES.....	260

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

12.4 CONCLUSIONS ON ENVIRONMENTAL MONITORING PLAN	261
12.5 CONCLUSIONS ON PUBLIC PARTICIPATION	261
12.6 CONCLUSIONS ON COMPREHENSIVE ASSESSMENT	261
ATTACHED TABLE 1_CIVIL WORKS CONSTRUCTION CHECKLIST.....	262
ATTACHED TABLE 2_ENVIRONMENTAL PROTECTION RECTIFICATION NOTICE	267
ATTACHED TABLE 3_WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT_PUBLIC CONSULTATION QUESTIONNAIRE	268

1. Introduction

1.1 Project Background

Gansu Province has witnessed remarkable development of its technical and vocational education and training (TVET) sector since the beginning of the “12th Five-year Plan” period, reflected in increasing size, improved conditions and strengthened service capacity of TVET schools. Every year, TVET schools in Gansu Province enroll 174,000 students in total and has more than 500,000 students in school; every year, approximately 150,000 technical and skilled labor with TVET experience are output to the society, maintaining an employment rate of more than 90%; and every year, nearly 1,000,000 trainees receive TVET skill training of various types. TVET has become an important driving force of economic restructuring, industrial upgrading and development and employment and livelihood improvement in the Province.

Nevertheless, the Province’s TVET sector still has problems, e.g. weak attraction, outdated concept of development, weak fundamental capacity, inadequate enterprise participation, outdated training models, unreasonable hierarchical structure and imperfect institutional system. As a result, TVET sector in the Province remains unable to fully meet the demand for accelerating transformation of economic development pattern. In accordance with the relevant plans, in the five years to come, the Province’s TVET sector needs to fully implement the Decision by the State Council on Accelerating the Development of a Modern TVET System” and the Outline of the National Medium and Long-term Education Reform and Development Plan (2010-2010), speed up the development of modern TVET in alignment with the specific circumstances of Gansu Province and according to the national top-level design, and significantly promote the market pertinence and social attraction of TVET, train and output a large pool of high-quality labor and technical and skilled talents with excellent professional ethics and transform its labor resource advantage into talent resource advantage so as to provide talent and intelligence supports needed by the Province to achieve economic transition, leap-forward development and overall social progress.

Currently in a golden era with policies for accelerated growth, opportunities of policy superposition and efforts of upgrading and leap-forward, the TVET sector of Gansu Province is in the face of both new challenges and historical opportunities. In such a context, Gansu Department of Education (DoE), with supports and assistances from Gansu Provincial Government (GPG) and the concerned authorities, proposed the implementation of the “World Bank Loan Gansu Technical and Vocational Education and Training Project” in order to fully enforce the keynotes of the National TVET Work Conference, the Decisions by the State

Council on Accelerating the Development of a Modern TVET System, the Modern TVET System Construction Plan (2014-2020) as well as the Opinions of GPG on Implementing the Decisions by the State Council on Accelerating the Development of a Modern TVET System and build up a modern TVET system, set up innovative school-industry cooperation models and develop industries with special advantages and establish a benign operation mechanism realizing interactive and mutual promotion of HR demand by industries with special advantages and HR supply by TVET sector. The Project has been identified as one of the candidate WB loan projects for the fiscal years of 2015-2017 with a proposed loan of USD 120,000,000 from the World Bank.

The “World Bank Loan Gansu Technical and Vocational Education and Training Project” involves the construction of project components in four project schools, which, in nature, may be further categorized into “hard activities” aiming at infrastructure construction or equipment procurement and “soft activities” aiming at strengthening the development of TVET system and improving the quality and relevance of TVET delivery in Gansu Province. The “hard activities” mainly include construction of school buildings and procurement of associated equipment for the four project schools. The remaining components constitute the “soft activities”. The component involving environmental management plans is the construction of school buildings in the four project schools, including teaching building, practical training building, student dormitory building and canteen of Gansu Vocational College of Energy and Chemical (GVCEC), practical training building, teaching building and student dormitory building of Gansu Finance and Trade Vocational College (GFTVC), the Art Practice Center of Lanzhou University of Arts and Science (LUAS) and the teaching building and teaching and office room building of Gansu Senior Technical School of Mechanics (GSTSM). See Table 1-1 for construction details and Figure 1-1 for site locations of buildings to be constructed.

**Table 1-1 Locations of EMP Implementation and Buildings to be Constructed under the
 WB Loan Project**

S.N	Location	School	Building Description
1	Lanzhou	Gansu Vocational College of Energy and Chemical	Teaching Building No. 24, Practical Training Building No. 4, Student Dormitory Building No. 31 and No. 32, Student Canteen No. 30, Dormitory Building No. 33
2	Lanzhou	Gansu Finance and Trade Vocational College	Practical Training Building No. 18 and No. 19, Second Teaching Building No. 21, Student Dormitory Building No. 22, Area AB of Practical Training Building No. 20
3	Lanzhou	Lanzhou University of Arts and Science	Art Practice Center
4	Tianshui	Gansu Senior Technical School of Mechanics	Teaching Building (A,B) , Teaching and Office Room Building



Figure 1-1 Location Map of EMP Implementation Sites of the WB Loan Project

1.2 Objectives of Environmental Management Plan

It is agreed between the World Bank Mission and Gansu Department of Education that a comprehensive and practical environmental management plan (EMP) is needed for the Project.

In order to eliminate or compensate the negative environmental and social impacts generated during the implementation of the Project and reduce them to an acceptable level, it is necessary to develop, as a part of the management actions of the Project, a package of mitigation plans, monitoring plans and institutional building measures and their implementation arrangement plans (i.e. the environmental management plan) that are technically reliable, economically feasible and suitable for implementation in the design period, construction period and operation period of the Project.

The EMP is developed in order to improve activities of project selection, site selection, planning, design and implementation through development of practical and feasible measures for preventing, reducing, mitigating or compensating negative environmental impacts and reinforcing positive environmental impacts, mitigate and manage negative environmental impacts through measures taken throughout the implementation of the Project and assess the actual effectiveness of the mitigation measures through implementation of environmental monitoring plan and recommend further improvement and mitigation measures based on the monitoring results.

Therefore, the key objectives of the EMP of the Project include:

1、 To conduct qualitative analysis and assessment of the condition of natural environment and socioeconomic development of the project area, identify the scope and level of impact assessment and review the design and execution of the environmental protection program of the Project;

2、 To describe and assess the positive environmental impacts and identify, screen and conduct predictive analysis of negative environmental impacts likely to be generated during the implementation of the Project.

3、 To propose tailored and effective mitigation measures for key inevitable negative environmental impacts;

4、 To develop requirements to assure timely and effective implementation of such tailored measures;

5、 To assess the actual effectiveness of the mitigation measures through implementation of the environmental monitoring plan.

1.3 Development of EMP

As shown in Table 1-2, there are three categories of projects in accordance with the “World Bank Operation Manual --- Environment Assessment” OP4.01 and based on the level and scope of environmental impacts likely to be generated by the proposed project as well as the level of

environmental sensitivity of the project area.

Table 1-2 EIA Categories of Construction Projects

EIA Category	Environmental impacts	Content of EIA
A	Construction projects likely to generate significant negative environmental impacts	Projects of this category require a comprehensive EIA.
B	Construction projects likely to generate negative environmental impacts that are of limited scope and degree and may be remarkably mitigated through implementation of required prevention and control measures using advanced and proven technologies	Projects of this category generally require special environmental impact assessment or environmental impact analysis based on the characteristics of the engineering and environmental factors instead of a comprehensive EIA.
C	Construction projects generating no or minimal negative environmental impacts	Projects of this category only need to fulfill the procedure environmental protection administration filing and generally require no environmental impact assessment or environmental impact analysis.

Based on the site survey conducted by the World Bank Environment Specialist, Provincial PMO and Project EIA Team, there are neither ecologically sensitive and vulnerable zones nor environmentally sensitive zones requiring special protection and social concern in the project area and, so far as the nature, scope and impact level of the Project and the environmental characteristics of the project area are concerned, the impacts generated by the Project on the surrounding environment are short, insignificant and reversible and the Project is finally assessed as Category B, which is consistent with the World Bank documents related to the Project.

2. Policy and Legal Framework

2.1 Environmental protection laws

- (1) Environmental Protection Law of the People’s Republic of China (Jan. 1, 2015);
- (2) Law of the People’s Republic of China on Environmental Impact Assessment (Dec. 29, 2018);
- (3) Law of the People’s Republic of China on Prevention and Control of Environment Noise Pollution (Dec. 29, 2018);
- (4) Law of the People’s Republic of China on Prevention and Control of Air Pollution (Oct. 26, 2018);
- (5) Law of the People’s Republic of China on Prevention and Control of Water Pollution (Jan. 1, 2008);
- (6) Law of the People’s Republic of China on Prevention and Control of Solid Waste Environmental Pollution (Nov. 7, 2016);
- (7) Law of the People’s Republic of China on Water and Soil Conservation (Mar. 1, 2011);
- (8) Land Administration Law of the People’s Republic of China (Jan. 1, 2020);
- (9) Law of the People’s Republic of China on Protection of Cultural Relics (Nov. 5, 2017).

2.2 Bylaws, Regulations and Normative Documents on Environmental Protection

- (1) Decision by the State Council on Environmental Protection Issues (State Council Doc. No. [1996]31;
- (2) Environmental Protection Management Regulations for Construction Projects, State Council Order No. (1998)253;
- (3) National Catalog of Hazardous Wastes (Edition 2021), Nov. 25, 2020;
- (4) Notice on Issues of Environmental Noise in Environmental Impact Assessment of Highway, Railway (Including Light Rail) Construction Projects, MoEP Doc. No. [2003]94;
- (5) Notice on Issuance of the National Outlines for Protection of Ecological Environment, State Council Doc. No. [2000]38;
- (6) Basic Farmland Protection Regulations, State Council Order No. (1998)257;

- (7) Regulations on Implementation of the Law of the People’s Republic of China on Water and Soil Conservation, State Council Order No. (1993)120;
- (8) Catalog of Classification and Management of Environmental Impact Assessment for Construction Projects, MoEP Order No. (Edition 2021), Decree No. 16 of the Ministry of Ecological Environment, Nov. 30, 2020;
- (9) *Measures for Public Participation in Environmental Impact Assessment*, Decree No.4 of the Ministry of Ecological Environment;
- (10) Management Methods for Water and Soil Conservation Programs of Development and Construction Projects, Water-Soil Doc. No. [1994]512;
- (11) Guiding Catalog for Industrial Restructuring (Edition 2019), Jan. 1, 2020 ;
- (12) Notice on Strengthening Management of Environmental Impact Assessment of Projects Utilizing Loan from International Financial Institutions, MoEP Monitoring Doc. No. [1993]324;
- (13) Environmental Protection Regulations of Gansu Province, Jan. 1, 2020;
- (14) Industrial Water Use Quota of Gansu Province (Edition 2017), (Jun. 21, 2017)

2.3 Technical Guidelines on Environmental Protection

- (1) Technical Guidelines on Environmental Impact Assessment – General (HJ2.1-2016);
- (2) Technical Guidelines on Environmental Impact Assessment – Air Environment (HJ2.2-2018);
- (3) Technical Guidelines on Environmental Impact Assessment-Surface Water Environment (HJ2.3-2018);
- (4) Technical Guidelines on Environmental Impact Assessment – Ground Water Environment (HJ610-2016);
- (5) Technical Guidelines on Environmental Impact Assessment –Sound Environment (HJ2.4-2009);
- (6) Technical Guidelines on Environmental Impact Assessment –Ecological Impact (HJ19-2011);

2.4 World Bank Safeguard Policies and Environment, Health and Safety (EHS) Guidelines

WB safeguard policies aim to assure that appropriate considerations are given to social and environmental impacts generated by WB-financed projects, including analysis of possible impacts and measures for mitigating negative impacts, so as to not only avoid hazards to environment or affected persons, but also improve project design, increase efficiency of execution and safeguard the credit standing of the World Bank and the borrower country. Policy documents related to the Project include the World Bank Operation Manual OP4.01 and the Environment, Health and Safety Guidelines (EHS Guidelines).

Details of operation policies involved in the Project are shown in Table 2-1.

Table 2-1WB Operation Policies and EHS

WB Operation Policies		Triggered?	Description
OP4.01	Environmental assessment	Yes	Fund provided by the proposed project will be utilized in skill training and new school buildings needed for such training. The civil works of each school included in the project plan basically comprise of buildings of 5 or 6 stories. Such buildings will be located on existing land on campus and no land acquisition or resettlement is involved. Water supply, drainage and electricity supply to be provided by existing systems on campus can satisfy normal operational needs of such buildings and no additional equipment is needed. Based on the project type, location, sensitivity and scope, the potential impacts to be involved in the Project are insignificant and only limited in the project area. Therefore, it is recommended that the Project be categorized in Category B and it is necessary to prepare an Environmental Management Plan (EMP) for the civil works of the four project schools to cover the environmental management activities of the Project.
OP4.04	Natural habitat	No	The civil works of the Project are located on existing campuses and it is verified through site visits that the Project will not produce any impacts on any natural habitats or important natural habitats referred to in the policy definitions.
OP4.09	Pest management	No	The Project will neither involve procurement of pesticides nor result in increase of pesticide usage.
OP4.10	Indigenous People	No	This policy will not be triggered since all the schools under the Project are not located in populated areas of indigenous people (with three in Lanzhou, and one in Tianshui).
OP4.11	Cultural Heritage	No	The civil works under the Project are located in existing campuses. The EA Team confirmed after investigation that no physical cultural resources defined in this policy are involved, but the opportunity identification process should be incorporated into the EMP and relevant articles into the construction contracts.
OP4.12	Non-voluntary Resettlement	No	It is known from initial consultation with the PMO staff that all the proposed school improvement activities will occur in existing campuses of the four project schools and no new land acquisition is involved (with three schools located in the urban area of Lanzhou, and one in Tianshui).
OP4.36	Forest Protection	No	The Project components involve no felling or planting activities of any kind in forest areas, thus producing no impacts on forest areas.
OP4.37	Dam Safety	No	The Project involves no dam construction or rehabilitation contents defined in this policy.

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

OP7.50	International Waters	No	The Project involves no international waters defined in this policy.
OP7.60	Disputable Areas	No	The Project involves no disputable areas defined in this policy.

2.5 Relevant World Bank Policies on Epidemic Prevention and Control

- (1) Advice on the Use of Masks in the Context of COVID-19;
- (2) ESF/Safeguards Interim Note: COVID-19 Considerations in Construction/Civil Works Projects;
- (3) Rational Use of Personal Protective Equipment (PPE) for Coronavirus Disease (COVID-19);
- (4) Water, Sanitation, Hygiene, and Waste Management for the COVID-19 Virus

2.6 Other Relevant Documents

- (1) Lanzhou New District Master Plan (2011-2030);
- (2) Master Urban Plan of Lanzhou Municipality (2011-2020);
- (3) Master Urban Plan of Tianshui Municipality (2005-2020);
- (4) Feasibility Study Report of World Bank Loan Gansu Technical and Vocational Education and Training Project
- (5) Consultation Report of Preliminary Design of No. 33 Dormitory Building of Gansu Vocational College of Energy and Chemical Industry;
- (6) World Bank Loan Gansu Technical and Vocational Education and Training Project, Phase III Construction Project of Gansu Finance and Trade Professional College-General Description of Preliminary Design of Area AB of Practical Training Building No. 20 and Area C of Dormitory Building No. 22.

2.7 Environmental Function Zone Planning and Assessment Standards

The individual environmental function zoning and evaluation standard of the Project are determined in accordance with the environmental function zoning of the regions where the project schools are located. See Table 2-2 for detail.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Table 2-2 Environmental Function Zoning and Applicable Standards for the Proposed Project Area

	Sound Environment Function Zoning and Applicable Standards	Air Environment Function Zoning and Applicable Standards	Surface Water Environment Function Zoning and Applicable Standards
(1) Gansu Vocational College of Energy and Chemical	<ul style="list-style-type: none"> ⊙ Located in the TVET Park in Lanzhou New District (LND), the proposed project area primarily belongs to a cultural and educational function zone requiring quiet environment. Since the proposed project is located in a distance of less than 200m from the planned urban roads on both sides and subject to significant impacts of traffic noise, it is recommended based on the “Notice on Issues of Environmental Noise in Environmental Impact Assessment of Highway, Railway (Including Light Rail) Construction Projects” that the noise standards of 60dB in day and 50dB at night as specified in the Sound Environment Quality Standard (GB3096-2008) be applied in this EIA. ● Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011) should be applied during the construction period. 	<ul style="list-style-type: none"> ⊙ The proposed project area is located in a Class II ambient air quality function zone and Class II standards specified in the Ambient Air Quality Standard (GB3095-2012) are applicable. ⊙ Indoor Air Quality Standard (GB/T18883-200) will be applied for indoor air quality during decoration. ● Emission Standards of Cooking Fume (Trial) (GB18483-2001)* will be applied for cooking fume. ● Emission standards of 60dB in day and 50dB(A) at night specified in Emission Standard for Environmental Noises on the Boundary of Industrial Enterprises (GB12348-2008) will be applied. 	<ul style="list-style-type: none"> ● The proposed project involves no surface waters within a distance of 200m in its neighborhood and the domestic wastewater generated by the Project is discharged into municipal sewage pipelines after pretreatment in the school septic tanks and is not directly discharged into the surface water. The wastewater should be treated to Class III standards in the Comprehensive Discharge Standard for Wastewater (GB8979-1996) before discharged into the municipal sewage pipelines and finally delivered to the WWTP in the cities where the schools are located for compliance treatment.
(2) Gansu Finance and Trade Vocational College	<ul style="list-style-type: none"> ⊙ Located in the TVET Park in Lanzhou New District (LND), the proposed project area primarily belongs to a cultural and educational function zone requiring quiet environment. Since the proposed project is located in a distance of less than 200m from the planned urban roads on both sides and subject to significant impacts of traffic noise, it is recommended based on the “Notice on Issues of Environmental Noise in Environmental Impact Assessment of Highway, Railway (Including Light Rail) Construction Projects” that the noise standards of 60dB in day and 50dB at night as specified in the Sound Environment Quality Standard (GB3096-2008) be applied in this EIA. ● Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011) should be applied during the construction period. 		
(3) Gansu Senior	<ul style="list-style-type: none"> ⊙ Located in the Qinzhou District of Tianshui City, the proposed project area primarily belongs to a residential, medical and health and cultural and educational function zone. Since the school is 		

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Technical School of Mechanics	<p>located close to Chiyu Road, it is recommended based on the “Notice on Issues of Environmental Noise in Environmental Impact Assessment of Highway, Railway (Including Light Rail) Construction Projects” that the noise standards of 60dB in day and 50dB at night as specified in the Sound Environment Quality Standard (GB3096-2008) be applied in this EIA.</p> <ul style="list-style-type: none"> ● Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011) should be applied during the construction period. 		
(4) Lanzhou University of Arts and Science	<ul style="list-style-type: none"> ⊙ Located in the Yantan of Lanzhou City, the proposed project area primarily belongs to a residential, medical and health and cultural and educational function zone. Since the proposed project is located close to Chiyu Road, it is recommended based on the “Notice on Issues of Environmental Noise in Environmental Impact Assessment of Highway, Railway (Including Light Rail) Construction Projects” that the noise standards of 60dB in day and 50dB at night as specified in the Sound Environment Quality Standard (GB3096-2008) be applied in this EIA. ● Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011) should be applied during the construction period. 		
<p>Note: ⊙ indicates environmental quality standards; ● indicates pollutant emission standards; ★ This standard is applicable to Gansu Vocational College of Energy and Chemical.</p>			

2.6.1 Environmental Quality Standards

(1) Sound Environment

The noise standards of 60dB in day and 55dB at night specified in the Sound Environment Quality Standards (GB3096-2008) will be applied to all the project schools.

(2) Air Environment

Class II standards specified in the Ambient Air Quality Standards (GB3095-2012) will be applied.

Table 2-3 Ambient Air Quality Standards (GB3095-2012)

Function Zone	Average time	Concentration limit (mg/m ³)			
		SO ₂	NO ₂	PM ₁₀	TSP
Class II zone	Annual average	0.06	0.04	0.07	0.2
	Daily average	0.15	0.08	0.15	0.3
	Hourly average	0.5	0.2	/	/

Indoor Air Quality Standard (GB/T18883-2002) will be applied during decoration.

Table 2-4 Indoor Air Quality Standards (GB/T18883-2002)

SN	Parameter type	Parameter	Unit	Standard value	Remarks
1	Chemical	NH ₃	mg/m ³	0.20	1-hour average
2		HCHO(methanol)	mg/m ³	0.10	1-hour average
3		C ₆ H ₆ (benzene)	mg/m ³	0.11	1-hour average
4		TVOOC(total volatile organic compound)	mg/m ³	0.60	8-hour average
5	Radioactive	Chlorine 222Rn	Bq/m ³	400	Annual average (action level c)

Note: The above indicators are monitored items upon acceptance monitoring.

2.6.2 Pollutant Emission Standards

(1) Air Pollutant Emission Standards

The major air pollutant involved in this Project is the cooking fume generated by the canteen of Gansu Vocational College of Energy and Chemical. The Emission Standard of Cooking Fume (Trial) (GB18483-2001) will be applied. See Table 2-5 for detail.

Table2-5 Emission Standards of Cooking Fume

Scope	Small	Medium	Large
Benchmark stove number	≥1, <3	≥3, <6	≥6
Total capacity of corresponding stoves103J/h	≥1.67, <5.00	≥5.00, <10	≥10
Total projected area of corresponding exhaust hood on the stove(m ²)	≥1.1, <3.3	≥3.3, <6.6	≥6.6
Maximum permitted emission concentration(mg/m ³)	2.0		
Minimum removal rate of purification facility (%)	60	75	85

Note: “Cooking businesses emitting fume must have fume purification facilities installed and assure such facilities are operated according to the requirements. Uncontrolled emission is deemed as non-compliant”.

(2) Noise Emission Standards

Construction noises during the construction period of the Project shall comply with the Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011). See Table 2-6 for detail.

Upon completion, the project schools should enforce the noise emission standards of 60dB(A) in day and 50dB(A) at night specified in Emission Standard for Environmental Noise on the Boundary of Industrial Enterprises (GB12348-2008).

(3) Water Pollutant Emission Standards

Wastewater generated by the proposed project mainly comprises of domestic wastewater, which is discharged into municipal sewage pipelines after pretreatment in the school septic tanks and is not directly discharged into the surface water. The wastewater should be treated to Class III standards in the Comprehensive Discharge Standard for Wastewater (GB8979-1996) before discharged into the municipal sewage pipelines and finally delivered to the WWTP in the cities where the schools are located for compliance treatment.

Table 2-7 Comprehensive Wastewater Discharge Standard (Unit: mg/l)

SN	Item	Class III
1	pH	6-9
2	SS	400
3	BOD5	300
4	CODcr	500
5	Animal and vegetable oil	100
6	Number of fecal coliforms	5000/L
Note: The above indicators are monitored items upon acceptance monitoring.		

3. Project Overview

3.1 Introduction of Project Area

3.1.1 Overview of Gansu Province

Gansu Province is located in the geographical center of China at the upper reaches of the Yellow River with a vast territory spanning from 32°11'to 42°57'north latitude and 92°13' to 108°46' east longitude. Having Shaanxi on the east, Ningxia on the northeast, Sichuan on the south and Qinghai and Xinjiang on the west and Inner Mongolia on the north as its neighboring provinces, Gansu Province also borders the People's Republic of Mongolia.

Gansu has a complex topography comprising of complete elements including mountains, plateaus, plains, valleys, deserts and Gobi in staggered distribution and an inclining terrain from southwest to northeast. Gansu has a total land area of 454,000km², accounting for 4.72% of the total land area of China and ranking the seventh. It has an elongated terrain that is 1655 km long east to west and 530 km wide north to south. The boundary line is 8700 km long and the narrowest area is only 25 km. Mountains and plateaus take more than 70% of the Province's total land area; and a large area of Gobi and desert is present in its northwest part, accounting for about 14.99% of its total land area.

Gansu Province is a northwest inland province with difficult accessibility of warm and humid ocean airflow and little chance of rain. Most of its territory is dry and belongs to very strong continental temperate monsoon climate featuring in long and cold winters, vague spring-summer boundary, short and hot summers and fast cooling autumns. The annual average temperature in the Province ranges from 0 to 16°C and due to the different elevations, the various parts of the Province have big temperature differences, adequate sunshine and big day temperature difference.

The Province as a whole has an annual precipitation of 36.6mm to 734.9mm decreasing from the southeast to the northwest. Precipitation in areas west of Wushaoling Mountain is obviously less while that in Longnan Mountainous Area and the east section of Qilian Mountain is bigger. Affected by the monsoon, precipitation is concentrated in June to August, accounting for 50 to 70% of the annual precipitation. Different parts of the Province have largely different frost-free periods, with that in Longnan Valley lasting for about 280 days while that of Gannan Plateau being the shortest of only 140 days.

3.1.2 Overview of Lanzhou City

Located at 36°03' north latitude and 103°40' east longitude, Lanzhou, a city on the Yellow

River, is the geometrical center on the world geographical map and the only provincial capital with the Yellow River flowing through the urban center. Under the influence of the mountainous terrain on the northern and southern sides, the urban area is in a long and narrow shape that is approximately 30km long east to west and the narrowest part is only around 5km south to north, carrying the obvious characteristics of a belt-shaped basin city with an average elevation of 1518m. Lanzhou belongs to the temperate continental climate with an annual average temperature of 10.3°C. With no intense heat in summer and severe cold in winter, Lanzhou is a well-known summer resort. Its annual average sunshine time is 2446 hours and the frost-free period is 180 days. Precipitation, with an annual average of 327mm, is concentrated in the months of June to September.

Lanzhou is the provincial capital and political, cultural, economic and science and education center of Gansu Province and has under its jurisdiction 5 districts of Chengguan, Qilihe, Xigu, Anning and Honggu, 3 counties of Yongdeng, Yuzhong and Gaolan and Lanzhou New District (LND), Lanzhou National Hi-tech Development Zone and Lanzhou Economic and Technological Development Zone. The total urban area is 13,100km². As of the end of 2014, the city has a resident population of 3,664,900, a registered population of 3,216,400 and a non-agricultural population of 2,009,900. There are 56 ethnic groups including Han, Hui, Manchu, Tibetan, Dongxiang, Yugu, etc.

Officially approved by the State Council on Aug. 20, 2012, Lanzhou New District (LND) becomes the 5th national new district in China and the 1st in the northwest provinces. According to the approval document of the national government, Lanzhou New District (LND) will be built into a nationally important industrial base, an important economic growth pole in Northwest China and an important strategic platform opening westward to the outside world and a demonstration zone to undertake industrial transfer.

3.1.3 Overview of Tianshui City

Tianshui is located at 104°35'to 106°44' east longitude and 34°05'to 35°10' north latitude in the southeastern part of Gansu Province on the borders of the three provinces of Shaanxi, Gansu and Sichuan and halfway from Xi'an to Lanzhou. The average elevation in the urban area is 1100m.

With a total area of 14,392km², Tianshui has under its jurisdiction 2 districts of Qin Zhou and Maiji and 5 counties of Gangou, Wushan, Qin'an, Qingshui and Zhangjiachuan Hui Autonomous County. Tianshui has a total population of 3,400,000 and a resident population of 3,720,000, including an urban population of 1,200,000. With a population of 603,000 in the

urban area, its urbanization rate has reached 33%.

Tianshui is located in a mountainous terrain that is high in the northwest and low in the southeast and has an elevation ranging from 1000 to 2100m. Mt. Tianyeliang, the highest peak in Tianshui, is 3,120m high while Niubei Village, the lowest point, is only 760m in elevation. Topographically featuring in the distinct regional landform differentiation, Tianshui has a mountainous landform in its eastern and southern parts formed from the ancient folded and uplift strata and a loess hilly landform in its northern part formed from geological subsidence and red soil and loess layer deposition. There is a small area in its middle part where the Wei River valley landform is formed, under the influence of river division and erosion and accumulation in the Quaternary Period, from the Wei River Graben developed due to the fracture of the latitudinal tectonic zone.

Tianshui has an annual average precipitation of 574mm that decreases from southeast to northwest. Rainfall in the mountainous area in the middle and eastern parts amounts to more than 600mm while in the area north of Wei River is less than 500mm. With an annual average sunshine time of 2100 hours, Tianshui has neither severe cold winters nor intensely hot summers. In spring, temperature rises at high speed. In autumn, this area is under the unbroken spell of wet weather. The temperate climate in Tianshui features in four distinctive seasons, adequate sunshine and moderate precipitation.

3.2 TVET Overview

3.2.1 TVET in the Project Area

(1) TVET in Gansu Province

As of 2015, Gansu Province as a whole has 228 TVET institutions of all types, including 88 ordinary secondary specialized schools, 118 vocational high schools and 22 adult secondary specialized schools, and 229,348 students in school. The Province has totally 19,157 TVET teachers, including 2,888 teachers with both teaching and technical qualifications, accounting for only 18.54% of the total faculty, fully unable to meet the needs of TVET in Gansu Province.

In terms of office condition of the higher TVET institutions, in Year 2015, Gansu Province has an administrative office area of 1796317.69m², a per student teaching and administrative office area of 13.02m² and a per student school building area of 25.1m², an asset value of CNY 946,327,800 for its teaching and research instruments and equipment and a collection of 8,252,800 books. So far as the office condition of the secondary TVET institutions is concerned, in 2015, Gansu Province has an administrative office area of 2012112.4m², a per student teaching and administrative office area of 8.77m² and a per student school building area of

18.42m² and an asset value of CNY 1,081,065,200 for its teaching and research instruments and equipment and a collection of 5,824,400 books.

(2) TVET in Lanzhou City

In 2015, Lanzhou City as a whole has 67 TVET institutions of all types, accounting for 29.38% of the total of Gansu Province; in 2014, Lanzhou TVET colleges and schools have 69,636 students in school, accounting for 30.3% of the total of Gansu Province. Lanzhou has 44 ordinary secondary specialized schools with 64,996 students in school, 12 vocational high schools with 2,571 students in school and 11 adult secondary specialized schools with 2,069 students in school, TVET teachers in Lanzhou City as a whole has been decreasing from 6,381 teachers in 2011 to 5,368 teachers in 2014. The number of full-time teachers has also been decreasing from 3,925 teachers in 2011 to 3,587 teachers in 2015. Lanzhou City has a per student school building area of 20.1m² and an asset value of CNY 125,00,000 for its teaching and research instruments and equipment and a collection of 726,000 books.

(3) TVET in Tianshui City

At present, Tianshui City has 30 TVET institutions of all types, including 3 higher vocational colleges, 5 ordinary secondary specialized schools, 6 technical schools and 16 vocational high schools (secondary vocational schools), and 55,000 students in school. Among the secondary vocational schools, there are 4 national key schools, 5 provincial key schools and 1 municipal key school. The TVET institutions provide nearly 100 specialties under 10 categories substantially covering the primary, secondary and tertiary industries. A TVET system integrating the primary, secondary and higher TVET institutions and interconnected with the other education elements has taken shape. The TVET capability of providing service to economic development is remarkably stronger.

3.2.2 TVET Overview of Project Schools

(1) Gansu Finance and Trade Vocational College (GFTVC)

Gansu Finance and Trade Vocational College (GFTVC) was founded through the merge of 7 secondary vocational schools, including Lanzhou Clothing Workers College (Gansu Art Design School), Gansu Bank School, Gansu Economic School, Gansu Finance and Trade School, Gansu Economic Trade School, Gansu Industrial and Commerce Administration School, Gansu Commercial School.

GFTVC's development plan: Based on its master plan, GFTVC plans to have 3500 students in school in 2017 and 10000 students in 2020. Its campus in LND TVET Park will have a planned land area of 855mu and a planned building area of 392,000m², including 187,600m²

for Phase 1 scheduled to complete in 2017 with a total investment of CNY 810 million and 58,000m² for Phase 2 scheduled to commence in 2018 with a total investment of CNY 341 million, including a World Bank loan of CNY 297 million.

GFTVCfaculty: GFTVC has 368 full-time teachers, including 328 teachers with an education background of university degree or above. GFTVC plans to have a full-time teaching staff of 450 teachers (including practice tutors) and a full-time management and logistics staff of 100 persons, with the teaching and research staff accounting for more than 80% of the total number of teachers.

GFTVC's specialty construction plan: GFTVC plans to establish 8 specialty departments, including logistics, accounting, finance, economic management, art design, applied engineering, information technology and modern services, and starts to enroll students in 2016 for 5 specialties, namely, logistics management, e-commerce, accounting, financial management practices and art design. GFTVC will adjust and increase specialties based on the needs of social and economic development and its own operation capacity to manifest its own unique features in modern service sector among finance, commerce and trade colleges. By 2020, the total number of specialties will reach 36.

(2) Gansu Vocational College of Energy and Chemical (GVCEC)

Gansu Vocational College of Energy and Chemical (GVCEC) was founded through the merge of 4 secondary vocational schools, namely, Gansu Senior Technical School of Chemical Industry, Gansu Technical School of Construction Materials, Gansu Technical School of Coal Industry and Lanzhou Technical School of Electronics.

GVCEC's development plan: GVCEC has two campuses, the LND main campus and the Pingchuan sub-campus, involving a planned land occupation of 1,505mu (including 1,173mu for the main campus and 329mu for the sub-campus). Pingchuan Campus has an existing school building area of 91,800m². The main campus is to be developed in 2 phases under one planning. Phase 1 development to be implemented from June 2015 to December 2017 includes the main teaching building, the comprehensive building and the practical training building with a total building area of 139,700m², including a floor area of 132,400m² and an underground building area of 7,300m². Phase 2 development to be implemented from September 2016 to December 2018 involves a building area of 56,100m². The building area of the LND Main Campus and Pingchuan Campus will respectively reach 195,800m² and 91,800m², bringing the total building area of GVCEC up to 287,600m².

GVCECfaculty: GVCEC has a faculty of 393 persons, including 326 full-time teachers and 67 management and logistics staff.

GVCEC's specialty construction plan: GVCEC plans to initially establish the specialties of applied chemical technology, coal chemical technology, mine mechanical and electrical technology, material engineering technology, electrical automation technology, and machinery manufacturing and automation and computer network technology. GVCEC will establish new specialties to serve economic development of Gansu Province based on the needs of social and economic development and its own operation capacity and will develop its own unique features in the areas of equipment manufacturing, energy chemical industry, electronic information, new energy, new material and energy conservation and environmental protection. GVCEC plans to have 35 specialties in total.

(3) Secondary Specialized School of Lanzhou University of Arts and Science (LUAS)

Lanzhou University of Arts and Science (LUAS) is a provincial ordinary institution of higher education providing full-time undergraduate courses. Its predecessors are Gansu Institute of Education and Gansu Lianhe University respectively founded in 1950 and 1985 and merged in July 2001 into the new Gansu Lianhe University. In April 2013, at the approval of Ministry of Education, LUAS was founded on the basis of Gansu Lianhe University. LUAS is located in Yantan District, Lanzhou Gansu Province by the Yellow River. With a campus area of more than 1300 mu and a school building area of 330,000m², LUAS has more than 9000 full-time students in school and a faculty of more than 700 persons.

LUAS's faculty: The Secondary Specialized School of Lanzhou University of Arts and Science has 85 full-time teachers.

LUAS specialty construction plan: The Secondary Art School (Gansu Provincial Art School) mainly focuses on more than 10 specialties in the three areas of music, dancing and opera. LUAS's unique specialties include Dunhuang Dancing Performance, Qinqiang Opera Performance and Long Opera Performance and LUAS is the only school in Gansu Province providing training in the specialties of Qinqiang Opera Performance and Long Opera Performance.

(4) Gansu Senior Technical School of Mechanics (GSTSM)

Founded in 1973 and involving a land occupation of 152mu and a building area of 74,000m², Gansu Senior Technical School of Mechanics (GSTSM) has an in-service faculty of 208 persons, including 21 specialty leaders, 27 specialty construction managers and 83 teachers with both teaching and technical qualifications, 1 teacher subsidized by the State Council Special Government Allowance Program and 1 national famous TVET teacher. GSTSM has a number of teachers honored as the national, provincial and prefecture-level teachers of

excellence and has employed more than 60 senior engineers and technicians with rich practical experiences as specialty lecturers and practical training tutors.

3.3 Project Development Objectives

Through implementation of the Project, skilled professionals will be trained and provided for the industries of petroleum, chemical industry, non-ferrous metallurgy and equipment manufacturing where Gansu enjoys unique advantages. The Province's TVET sector will take HR development as the starting point to realize industrial innovation and set up a benign operation mechanism enabling interaction and mutual facilitation of HR demand of the industries with unique advantages and the HR supply of the TVET sector.

Through implementation of the Project, the project schools' hardware environment and teaching conditions will be improved, teaching performance evaluation standards and student examination and appraisal standard will be developed and improved, the school operation concepts will be enhanced and school-industry partnership will be upgraded and enriched and the school-industry partnership operating mechanism will be promoted. First-class and high-quality teaching forces will be trained and modular and theory-practice integration specialty design, teaching design and textbooks will be developed and adopted; school management will be more scientific and standardized; school-industry linkage will become much closer and training quality will be improved to provide significantly effective service to the society and radiate and drive TVET development in the surrounding areas. A large number of high-quality labors and practical professionals with professional behavior and ability will be output to contribute to the high-speed and high-quality development of regional economy.

3.4 Project Components

3.4.1 Project Components

The World Bank Loan Gansu TVET Project consists of components of four project schools, namely, Gansu Vocational College of Energy and Chemical, Gansu Finance and Trade Vocational College, Lanzhou University of Arts and Science and Gansu Senior Technical School of Mechanics.

Figure 1-1 shows the location of the four project schools in the respective cities in Gansu Province.

3.4.2 Geographical Location of Construction Works of the Project Schools

(1) Gansu Finance and Trade Vocational College, Gansu Vocational College of Energy and Chemical

Gansu Finance and Trade Vocational College and Gansu Vocational College of Energy and Chemical are located in the TVET Park in Zone B of the Science & Education Park of LND. The LND TVET Park construction site borders Baiyin-LND Class I Highway on its east, the City Ring Expressway on its west, the North Expressway on its north and the urban arterial street of Weiershiliu Road on its south, with the City Light Rail running south-to-north through the site center. The construction land parcel of the TVET Park is adjacent to Gansu Gymnasium Construction Project. See Figure 3-1 for location details.

campus at No. 400, Beimiantan, Chengguan District, Lanzhou. Bordering Yanbei Road, also the planned route of Metro Line No. 3 of Lanzhou City, and having the urban arterial streets of North Exit Street and Tianshui Road of Lanzhou City located 1km away to the north, the construction site has a flat and regular terrain and a layout plan meeting the requirements of school planning. See Figure 3-2 for location details.

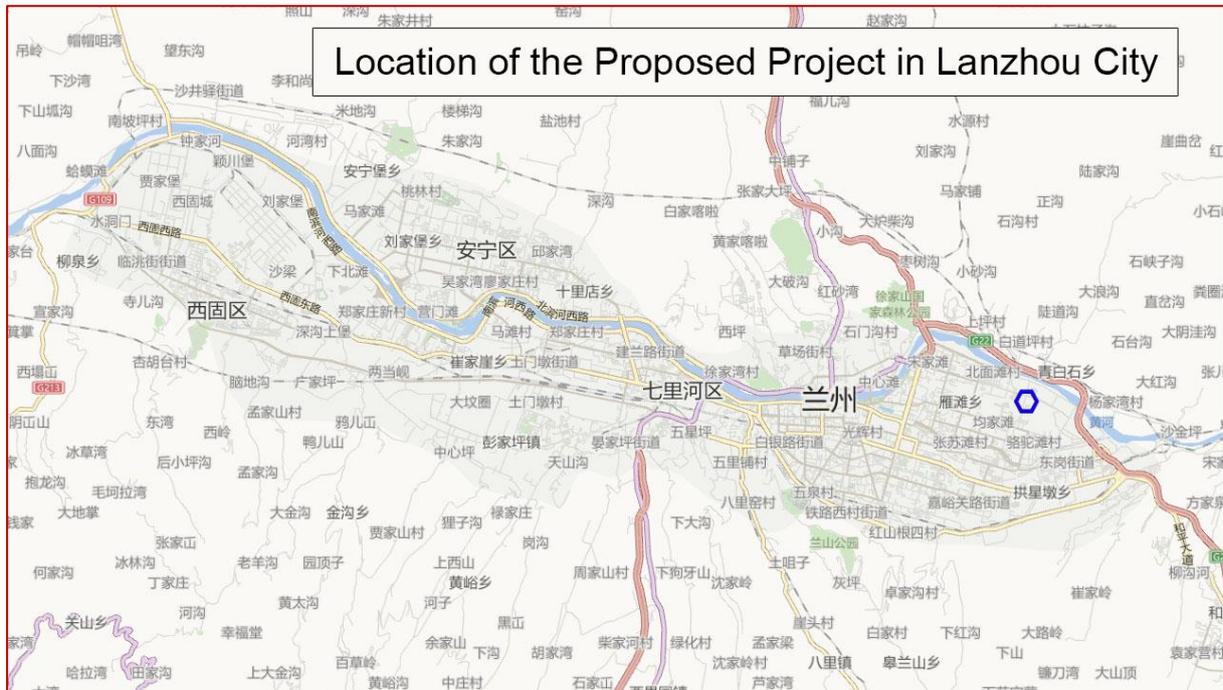


Figure 3-2 Location of Lanzhou Art & Science College in Lanzhou City

(3) Gansu Senior Technical School of Mechanics

The construction site of Gansu Senior Technical School of Mechanics Project is located in the southern campus of Gansu Mechanical and Electrical Vocational and Technical College at No. 107, Chiyu Road, Qinzhou District, Tianshui, Gansu Province. Surrounded by a campus road and student dormitories on the east, the west campus fencing wall on the west, the Central Campus Garden on the north and the rubber playground on its south and the South Hill, the construction site of Gansu Senior Technical School of Mechanics is a land parcel owned by the School and belongs to educational land. See Figure 3-3 for location details.



Figure 3-3 Location of Gansu Senior Technical School of Mechanics in Tianshui City

3.4.3 Construction Works of Each Project School

Table 3-1 shows in detail the construction works of each project school under the “World Bank Loan Gansu TVET Project”.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Table 3-1 List of Construction Components of the Proposed Project

Name of school	Construction Site	Construction Works	Construction Scope	Key Functions	Nature
Gansu Vocational College of Energy and Chemical	In the middle of LND TVET Park bordering Wenqixi Road on the east, Weiershiliu Road on the south, Beidou Road on the west and North Expressway on the north	Teaching Building No. 24, Practical Training Building No. 4 and Student Dormitory Buildings No. 31, No. 32, and No. 33, Student Canteen No. 30, as well as the supporting facilities and campus landscaping providing services to 2,320 students	The total building area as planned is 74322.07m ² , including 14233.58m ² for 1 teaching building, 14762.35m ² for 1 professional practical training building, 38368.14m ² for 2 student dormitory buildings, 6958m ² for 1 student canteen. Phase 2 planning contains no underground building.	The key function is teaching and practical training. The Practical Training Center mainly hosts the Automobile Engineering Practical Training Center, the Material Engineering Practical Training Center and the Elevator Practical Training Center.	New
Gansu Finance and Trade Vocational College	At the northwestern corner of LND TVET Park bordering Beidou Road and Expressway on the east, Weiershiliu Road on the south, Ketu Road on the west and North Expressway on the north	Practical Training Building No. 18, Practical Training Building No. 19 and Area AB of Practical Training Building No. 20, and Second Teaching Building No. 21, Student Dormitory Building No. 22 and campus landscaping providing services to 2,074 students	The total building area as planned is 70326.43m ² , including 37046.61m ² for the comprehensive practical training building, 19737.36m ² for the second teaching building, 13542.46m ² for student dormitory building. Phase 2 planning contains no underground building.	The key functions are teaching, student dormitory and practical training and specialties involved are finance management, international trade, commercial English, computer application technology, fashion show, hotel service and management, tourism management, city light rail operation and management, etc.	New
Gansu Senior Technical School of Mechanics	Inside the Southern Campus of Gansu Senior Technical School of Mechanics at No. 107, Chiyu Road, Qinzhou District, Tianshui, Gansu Province	Teaching Building and Teaching Office Building of Gansu Senior Technical School of Mechanics (AB)	With a total building area of 34782m ² , the building complex comprises of the Teaching Building with 6 floors above the ground and the Teaching Office Building with 16 floors above the ground and 1 floor under the ground.	Floor No. 1 to 5 of the Teaching Building contain ordinary classrooms and practical training rooms while the 6 th Floor contains teaching research rooms and conference rooms. The 2 st Floor of the Teaching Office Building hosts the School History Exhibition Hall, the Fire Control Room and the Duty Room while Floors No. 2 to 15 are for teaching offices. The 16 th Floor is a big conference room and Basement 1 hosts	New

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

				equipment rooms such as power distribution rooms, heat exchange rooms and water pump rooms.	
Lanzhou University of Arts and Science	Inside the planned site of the Southern Campus of Lanzhou University of Arts and Science at No. 400, Beimiantan, Yantan, Chengguan District, Lanzhou, Gansu Province	Art Practice Center of Lanzhou University of Arts and Science (Gansu Art School)	With a total building area of 6100m ² , the building comprises of 1 floor above the ground and a half basement floor and partially 2 and 4 floors. The construction site is flat and has an excellent geological condition.	In terms of functional arrangement, the Art Practice Center mainly comprises of arena and auditorium in the center, both being single-storey. The half basement floor is mainly space for the stage pit, distribution room and air conditioners. The southern part of the building has four floors. Floor 1 is mainly the resting zone and evacuation exits and washrooms; Floor 2 and 3 are exhibition space while Floor 4 mainly provides office and management space. The eastern part of the auditorium has two floors, with the first floor mainly hosting the control rooms and the lobby and main entrance and exit while the second floor the multi-purpose hall; the western part of the arena comprises of four floors, with the first floor containing auxiliary makeup, waiting spaces and an actor/actress entrance on the northern side while the 2 nd , 3 rd and 4 th floors all for office and management purposes.	New

3.4.4 Relationship of Reliance between the Proposed Works and the Existing in-campus Facilities of each Project School

The civil works to be constructed under the proposed WB loan project are all located in the existing campuses and are reliant on the existing in-campus facilities of water supply, drainage and power supply and heating. See Table 3-2 for details in this regard.

Table 3-2 Relationship of Reliance between the Proposed Project Components and the Various Infrastructure Works

Type of works	Gansu Vocational College of Energy and Chemical	Gansu Finance and Trade Vocational College	Gansu Senior Technical School of Mechanics	Lanzhou University of Arts and Science	Feasibility of reliance
Main structures	Teaching Building No. 24, Practical Training Building No. 4, Student Dormitory Buildings No. 31, 32 and 33, Student Canteen No. 30	Practical Training Building No. 18 and 19, Area AB of Practical Training Building No. 20, Second Teaching Building No. 21, Student Dormitory Building No. 22	Teaching Building (AB) and Teaching Office Building	Art Practice Center	/
Public Utilities	Water Supply	Relying on water supply pipelines constructed in Phase I, water supply is connected into the buildings to be constructed under the Project.	Relying on existing in-campus water supply pipelines, water supply is connected into the buildings to be constructed under the Project.	Relying on existing in-campus water supply pipelines, water supply is connected into the buildings to be constructed under the Project.	Water supply capacity can meet the requirement.
	Drainage	New wastewater collection pipelines to be constructed inside the buildings are connected to the outdoor main drainage pipeline constructed in Phase I.	New drainage pipelines to be constructed inside the buildings are connected to the outdoor main drainage pipeline constructed in Phase I.	New drainage pipelines to be constructed inside the buildings are connected to the existing main drainage pipelines in campus.	Wastewater collection capacity can meet the requirement.
	Power Supply	Relying on the power grid of Phase I, power supply is connected into the buildings to be constructed under the Project.	Relying on the power grid of Phase I, power supply is connected into the buildings to be constructed under the Project.	Power distribution rooms are constructed to connect with the existing power supply in campus.	Connected to the existing power supply in campus.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

	Heating	Relying on the heating network of Phase I, heat supply is connected into the buildings to be constructed under the Project.	Relying on the heating network of Phase I, heat supply is connected into the buildings to be constructed under the Project.	Heat exchange stations are constructed to connect with the existing heating network in campus.	Connected to the existing heating network in campus.	Heating capacity can meet the requirement.
	Ventilation	Ventilation systems are provided in toilets, etc.	Ventilation systems are provided in toilets, etc.	Ventilation systems are provided in toilets, etc.	Ventilation systems are provided in toilets, exhibition halls, etc.	Ventilation requirement is met.
Environmental Protection Works	Exhaust gas	Ventilation fans are provided in the practical training rooms and fume purification equipment and ventilation system provided in canteens.	Ventilation fans are provided in the practical training rooms.	Ventilation fans are provided in the practical training rooms	/	Exhaust gas treatment requirements are met.
	Wastewater	Relying on septic tank constructed in Phase I, domestic sewage is pretreated and then discharged into the municipal wastewater pipelines; canteen and kitchen wastewater is treated through the oil separating tank and then discharged together with the domestic sewage into the septic tank and then pretreated and discharged into the municipal wastewater pipelines.	Relying on septic tank constructed in Phase I, domestic sewage is pretreated and then discharged into the municipal wastewater pipelines.	One new 100m ³ septic tank is to be constructed outdoors and the sewage is pretreated and then collected into the main drainage pipeline in campus before finally discharged into the municipal wastewater pipelines.	Domestic sewage is collected via the pipeline into the existing outdoor septic tank and then treated and discharged into the municipal wastewater pipelines.	Wastewater collection and treatment capacity can meet the requirement.
	Solid Wastes	(1) Domestic solid wastes collection bins are provided at specified service radius in the various buildings and structures. (2) Solid wastes generated from automobile engineering practical training activities may contain oil rags, which may be mixed and treated together with the domestic solid wastes. Such wastes are hazardous solid wastes exempted from all processes in the National Catalog of Hazardous Wastes (2016) and are not managed as hazardous wastes in full process.	Domestic solid wastes collection bins are provided at specified service radius in the various buildings and structures.	Domestic solid wastes collection bins are provided at specified service radius in the various buildings and structures.	Domestic solid wastes collection bins are provided at specified service radius in the various buildings and structures.	Solid waste collection and disposal requirements are met.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

	Noise	Sound insulation windows are installed.	Noise control requirements are met.			
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3.4.5 Layout Plan of the Construction Works of Each Project School

Layout plans of the construction works in each project school are shown in Figures 3-4 to 3-5.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

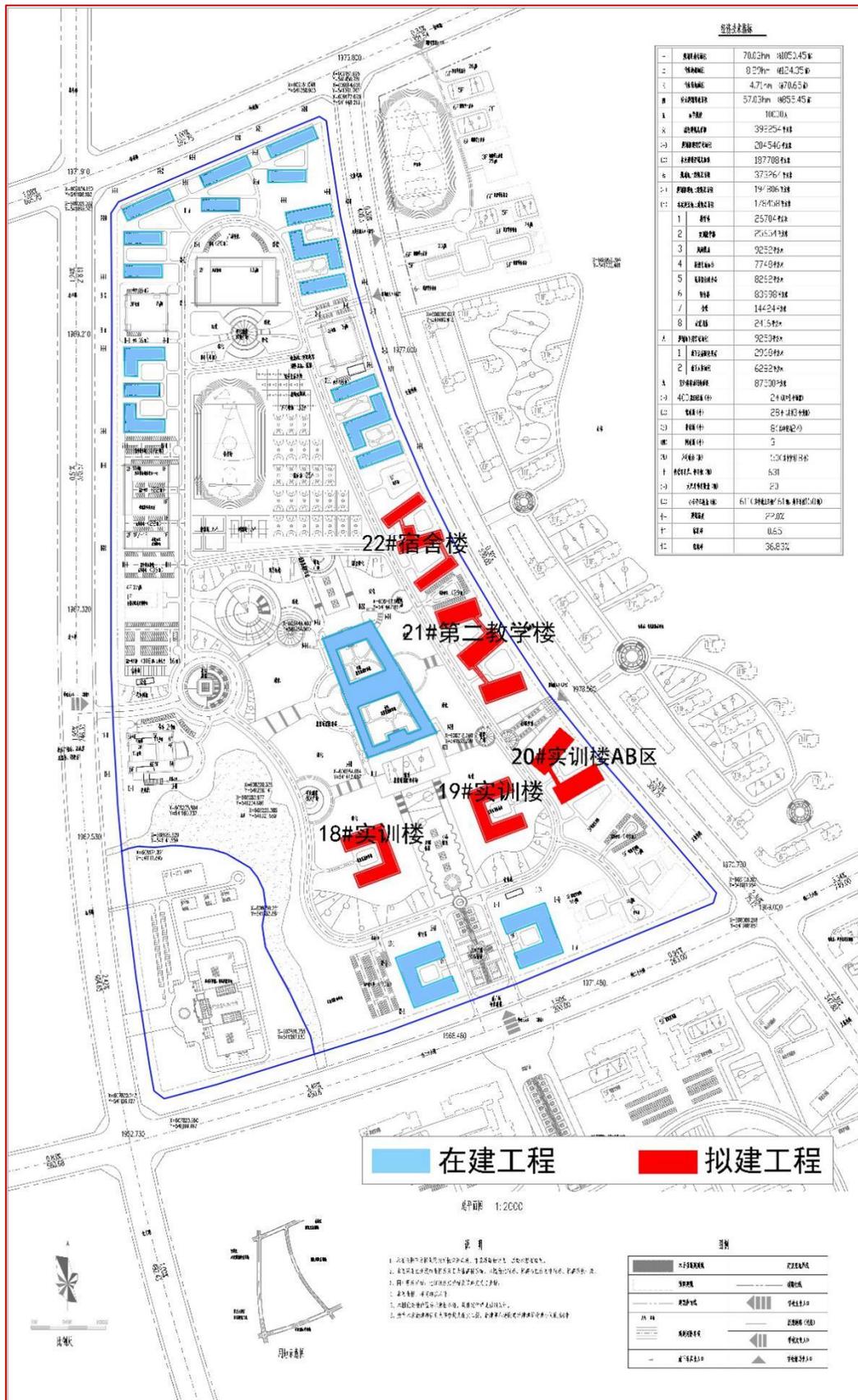


Figure 3-5 Layout Plan of Gansu Finance and Trade Vocational College



Figure 3-6 Layout Plan of Gansu Senior Technical School of Mechanics

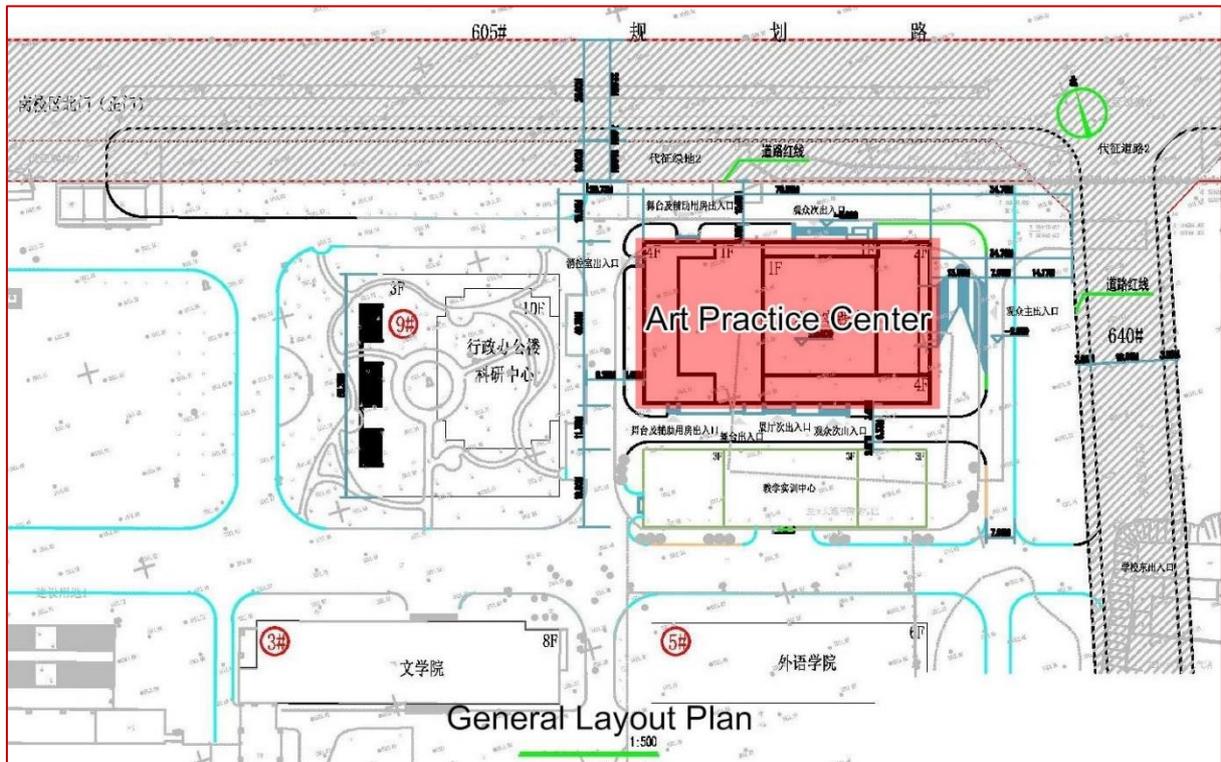


Figure 3-7 Layout Plan of Lanzhou University of Arts and Science

3.4.6 Project Land Occupation and Earthwork Balance

(1) Project Land Occupation

The proposed project involves a total land occupation of 39,754.02m² as land for construction works in the campuses of each project school, with no new land acquisition and resettlement involved. See Table 3-3 for details of land occupation of the Project.

Table3-3 Statistics of Land Occupation of the Project (Unit:m²)

Name of School	Land Occupation Area	Building Area	Nature of land occupation
Gansu Vocational College of Energy and Chemical	14947.5	74295.07	Land for construction works in campus
Gansu Finance and Trade Vocational College	17148.99	77759.11	Land for construction works in campus
Gansu Senior Technical School of Mechanics	4883.00	34782.00	Land for construction works in campus
Lanzhou University of Arts and Science	2774.53	6100.00	Land for construction works in campus
Total	39754.02	192936.18	

(2) Earthwork Balance

The proposed project involves a total earthwork excavation of approximately 40,247.6m³, backfill and leveling fill of 49,541.11m³ and earthwork transfer and reuse of 15,415.89m³ and spoildisposal of 6,122.38m³ during the construction period.

A borrow fill of 15415.89m³ will be needed for the construction works of Gansu Finance and Trade Vocational College. Since the World Bank Loan Project is Phase II construction works of Gansu Finance and Trade Vocational College and the College already took account of site leveling in the campus as a part of the overall construction planning and planned comprehensive allocation and utilization of earth and rock fill needed at all the construction sites in campus, the borrow fill needed for the construction sites under the proposed World Bank loan project will be sourced from the other construction sites on campus.

Spoil generated during the construction of the Project should be handled according to the construction waste disposal requirements of local environmental protection authorities in the project area.

Table 3-4 shows the earthwork balance of every project school.

Table 3-4 Earthwork Balance (Unit:m³)

Item	Excavation	Backfill amount	Borrow fill	Spoil disposal

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Gansu Vocational College of Energy and Chemical	12886.11	12886.11	0.00	0.00
Gansu Finance and Trade Vocational College	15258.97	30674.86	15415.89	0.00
Gansu Senior Technical School of Mechanics	9683.30	4407.65	0.00	5275.65
Lanzhou University of Arts and Science	2419.22	1572.49	0.00	846.73
Total	40247.6	49541.11	15415.89	6122.38

3.4.7 Identification of Environment Management Tools

An environmental management plan aims to eliminate or compensate the adverse environmental or social impacts generated during the implementation of a project and, therefore, its most important concern is the construction works of the project.

The Environmental Management Plan of the Project should include environmental code of practices (ECOP) and specific site impacts (SS). ECOP mainly refers to the impacts of general civil works and the impacts of specific items and their mitigation measures. Specific site impacts (SS) includes mitigation measures for the sensitive points and sensitive objects around the civil works during the construction period as well as handling of construction solid wastes and safety issues.

3.4.8 Selection of Environmental Impact Assessment Factors

(1) Construction Period

Environmental impacts during the construction period of the Project mainly come from noises, wastewater, exhaust gas and solid wastes generated during the construction process and from the domestic activities of the construction staff. See Table 3-5 for detail.

Table 3-5 Identification of Environmental Impacts during the Construction Period

Environmental Elements	Key Processes Generating Impacts	Key Impact Factors
Ambient air	Site leveling, foundation excavation, construction material transportation, storage and usage	Dust
	Operation of fuel-driven construction plants and transportation vehicles	Tail gas
	Indoor decoration	Exhaust gas from decoration activities
Water environment	Foundation excavation, mixing, washing	Construction wastewater
	Domestic activities of construction workers	Domestic sewage
Sound environment	Operation of construction plants and transportation vehicles	Noise
Solid wastes	Foundation excavation, material processing	Construction wastes
	Domestic activities of construction workers	Domestic wastes
Social environment	Construction vehicle management	Personnel safety
	Construction camp management	
	Construction staff behavior management	
	Environment, health and safety	

(2) Operation Period

After the Project is completed, the main pollutants will include wastewater, exhaust gas, noise and domestic solid wastes generated from the domestic and teaching activities of students and teachers on campus. See Table 3-6 for the identified environmental impacts during the operation period.

Table3-6 Identification of Environmental Impacts during the Operation Period

Environment al elements	Key Processes Generating Impacts	Key Environmental Factors
Gansu Vocational College of Energy and Chemical		
Water environment	Canteen, domestic activities of students and teachers on campus	Kitchen wastewater, domestic sewage
Sound environment	Teaching activities	Noises from social activities
	Practical training equipment	Equipment noises
Solid wastes	Domestic activities of students and teachers on campus	Domestic solid wastes
	Vehicle test and maintenance practical training room	Waste oil rag
Ambient air	Canteen	Fume

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Gansu Finance and Trade Vocational College		
Water environment	Domestic activities of students and teachers on campus	domestic sewage
Sound environment	Teaching activities	Noises from social activities
Solid wastes	Domestic activities of students and teachers on campus	Domestic solid wastes
Gansu Senior Technical School of Mechanics		
Water environment	Domestic activities of students and teachers on campus	domestic sewage
Sound environment	Teaching activities	Noises from social activities
Solid wastes	Domestic activities of students and teachers on campus	Domestic solid wastes
Lanzhou University of Arts and Science		
Water environment	Domestic activities of students and teachers on campus	domestic sewage
Sound environment	Performance and teaching activities	Noises from social activities
Solid wastes	Domestic activities of students and teachers on campus	Domestic solid wastes

4. Environmental Status & Sensitive Point Survey

4.1 Characteristics of the Project's Surrounding Environment

4.1.1 Status Quo of Civil Works Construction Sites of Project Schools

(1) Gansu Vocational College of Energy and Chemical, Gansu Finance and Trade Vocational College

On this construction site, the “LND TVET Park Three-school One-park Construction Project” is being implemented, which is Phase I Project of these schools. The World Bank Loan Project covers construction works of Phase II of these schools. The original landform of the construction site is loess low hills and the majority of the site has been leveled during Phase I construction. The site is located in LND TVET Park surrounded by planned roads and involves no villages of centralized residence within a distance of 200m.

See Figure 4-1 for details.

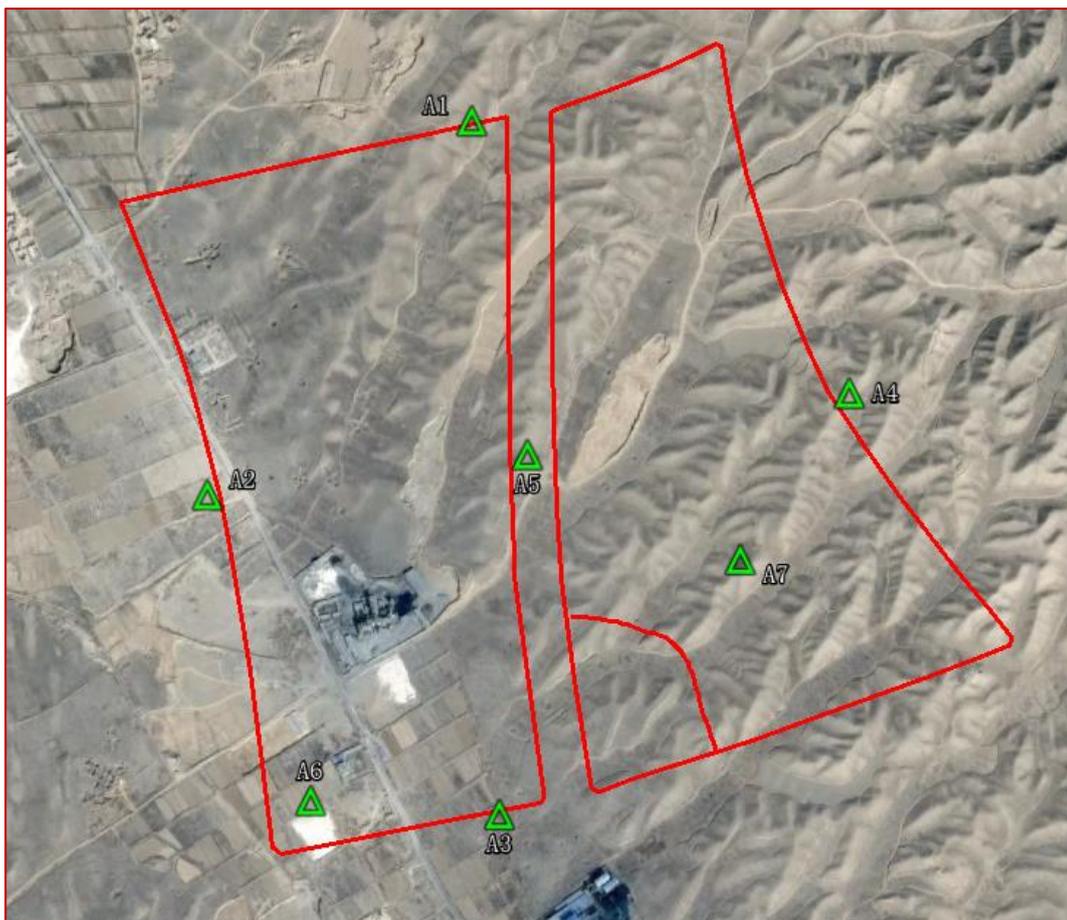


Figure 4-1 Construction Site and Surrounding Environment of Gansu Vocational College of Energy and Chemical and Gansu Finance and Trade Vocational College

(2) Gansu Senior Technical School of Mechanics

The construction site of this project school is currently hardened ground comprising of a football field and a small number of sport facilities as well as the school offices in the northwestern corner. All these structures will be demolished for the sake of construction of the Project. To the north and west of the site are the school's central greenbelt and Practical Training Building while to its south and east are a sports ground and internal roads and student dormitory buildings.

See Figure 4-2 for details.



Figure 4-2 Construction Site and Surrounding Environment of Gansu Senior Technical School of Mechanics

(3) Lanzhou University of Arts and Science

The construction site of Lanzhou University of Arts and Science is located on the northeastern side of its southern campus and is currently a landscaping area planted with trees and flowers. The site is adjacent to Yanbei Road on its north and the Teaching Building to its southwest, with the Practical Training Base and the sports ground respectively located to its

south and east.

See Figure 4-3 for detail.



Figure 4-3 Construction Site and Surrounding Environment of Lanzhou University of Arts and Science

4.1.2 Sound Environment Quality Status of the Project School Areas

Gansu Xinbaoli Environment Monitoring Co., Ltd. is engaged to conduct noise monitoring in areas around the project schools as a part of this EIA process aiming to study the sound environment quality status in the project area.

(1) Gansu Vocational College of Energy and Chemical, Gansu Finance and Trade Vocational College

1) Monitoring points

Since these two schools are adjacent to each other, monitoring points in this EIA were arranged based on the layout plan of both schools and the location of the proposed project. See Table 4-1 and Figure 4-1 for details of the noise monitoring points.

Table 4-1 Noise Monitoring Points

Monitoring Point No.	Location	Remarks
A1	North of GVCEC	Monitoring at monitoring points on the school boundary and adjacent to roads is required to be conducted in traffic peak hours, with distance from the monitoring points to the center lines of adjacent roads as well as traffic flow of different vehicle types recorded simultaneously.
A2	West of GVCEC	
A3	South of GVCEC	
A4	East of GFTVC	
A5	East of GVCEC	
A6	At the location of the proposed Practical Training Building of GVCEC	Unanticipated noises of construction and horns should be avoided.
A7	At the locations of the proposed Practical Training Buildings No. 18 and No. 19 of GFTVC	

2) Monitoring Time and Monitoring Frequency

The monitoring lasted for 2 consecutive days of the 21st and 22nd of April, 2016, one each day and night.

3) Monitoring Method

The monitoring methods stipulated in Sound Environment Quality Standard (GB3096-2008) and Provisional Technical Specifications on Routine Monitoring of Sound Environment Quality are adopted.

4) Monitoring Results

See Table 4-2 for the results of site boundary noise monitoring.

Table 4-2 Summary of Environmental Noise Monitoring Results(Leq dB(A))

Monitoring Point	Day & Night	Monitoring Date		Applicable standard
		April 21	April 22	
A1, north of GVCEC	Day	63.0	62.7	60
	Night	52.5	53.1	50
A2, west of GVCEC	Day	53.6	54.4	60
	Night	45.6	46.2	50
A3, south of GVCEC	Day	55.7	54.8	60
	Night	46.6	46.4	50
A4, east of GFTVC	Day	56.1	58.5	60
	Night	46.9	47.0	50
A5, east of GVCEC	Day	62.6	64.6	60
	Night	51.9	52.1	50
A6, at the location of the proposed Practical Training Building of GVCEC	Day	54.2	53.7	60
	Night	43.0	44.8	50
A7, at the locations of the proposed Practical Training Buildings No. 18 and No. 19 of GFTVC	Day	53.9	54.9	60
	Night	44.3	44.7	50

5) Sound Environment Quality Assessment

It is known from the noise monitoring results that the sound environment in the project school areas is of relatively good quality in general. Noise values at the monitoring points other than A1 and A5, where minimal non-compliance is detected, comply with the respective standards. Analysis of the monitoring sites reveals that the main cause of the non-compliant monitoring results at A1 and A5 is their adjacency to an arterial city street partially open to traffic and non-stop vehicle passage during construction.

Based on the monitoring of this area, it is indicated that the local sound environment quality will be impacted to different degrees as the construction works under the proposed project commence and the adjacent roads are open to traffic. The monitoring results show that impacts from the construction noises generated by the construction works in the schools are relatively small and of short duration and will end as the construction works complete. Traffic noise from the adjacent roads is a key factor leading to deterioration of the regional environment quality. Along with the development of LND, traffic flow in this region will grow, making road traffic noise a key source of noises in the region.

(2) Lanzhou University of Arts and Science

1) Monitoring Point

4 boundary noise monitoring points (B1, B2, B3 and B4) are arranged around the campus and 1 sound environment quality monitoring point (B5) is arranged in the campus. See Table 4-3 and Figure 4-3 for layout of the monitoring points.

Table 4-3 Sound Environment Monitoring Points

Monitoring Point No.	Position	Remarks
B1	North of LUAS	Monitoring at monitoring points adjacent to roads is required to be conducted in traffic peak hours, with distance from the monitoring points to the center lines of adjacent roads as well as traffic flow of different vehicle types recorded simultaneously.
B2	West of LUAS	
B3	South of LUAS	
B4	East of LUAS	
B5	In the construction site of the Project	During classes

2) Monitoring Time & Monitoring Frequency

The monitoring lasted for 2 consecutive days of the 19th and 20th of April, 2016, one each day and night.

3) Monitoring Methods

The monitoring methods stipulated in Sound Environment Quality Standard (GB3096-2008) and Provisional Technical Specifications on Routine Monitoring of Sound Environment Quality are adopted.

4) Monitoring Results

See Table 4-2 for the results of site boundary noise monitoring.

Table 4-4 Summary of Environmental Noise Monitoring Results (Leq dB(A))

Monitoring point	Day & Night	Monitoring Date		Applicable standard
		April 19	April 20	
B1, North of LUAS	Day	63.2	62.9	60
	Night	61.6	60.5	50
B2, West of LUAS	Day	53.9	51.8	60
	Night	52.4	52.5	50
B3, South of LUAS	Day	49.6	50.5	60
	Night	46.7	45.9	50
B4, East of LUAS	Day	71.7	69.7	60
	Night	67.2	67.0	50
B5, in the project construction site	Day	54.2	53.9	60
	Night	53	52.8	50

5) Sound Environment Quality Assessment

It is known from the noise monitoring results that the sound environment in the project school area is subject to significant impacts from its urban function layout, with noise level at the northern, eastern and western boundaries not compliant due to significant impacts from traffic noise on the adjacent roads and the sound environment on the southern boundary of fine quality because it is mainly subject to impacts from domestic noises of the adjacent residential blocks.

The construction site is located in the campus and, attenuated by roadside greenbelts and on-site vegetation, the sound environment quality on the project construction site is significantly better than the school boundary, with daytime monitoring results complying with the standard while nighttime monitoring results non-compliant. This is because that the construction site is close to Yanbei Road, which is an arterial urban street, and the day and night traffic flow is not of much difference resulting in similarly small difference of noise levels between day and night. The civil works to be constructed in this project school is the Art Practice Center that is mainly used for performance and watching and involves no overnight stay. Thus, minimal impact is produced from night time traffic noises.

(3) Gansu Senior Technical School of Mechanics

1) Monitoring Points

4 boundary noise monitoring points (C1, C2, C3 and C4) are arranged around the campus and 1 environment quality monitoring point (C5) is arranged in the campus. See Table 4-5 and Figure 4-2 for layout of the monitoring points.

Table 4-5 Sound Environment Monitoring Points

Monitoring Point No.	Position	Remarks
C1	North of GSTSM	Monitoring at monitoring points adjacent to roads is required to be conducted in traffic peak hours, with distance from the monitoring points to the center lines of adjacent roads as well as traffic flow of different vehicle types recorded simultaneously
C2	West of GSTSM	
C3	South of GSTSM	
C4	East of GSTSM	
C5	In the construction site of the Project	During classes

2) Monitoring Time & Monitoring Frequency

The monitoring lasted for 2 consecutive days of the 19th and 20th of April, 2016, one each day and night.

3) Monitoring Methods

The monitoring methods stipulated in Sound Environment Quality Standard (GB3096-2008) and Provisional Technical Specifications on Routine Monitoring of Sound Environment Quality are adopted.

4) Monitoring Results

See Table 4-6 for boundary noise monitoring results.

Table 4-6 Summary of Environmental Noise Monitoring Results(Leq dB(A))

Monitoring Point	Day & Night	Monitoring Date		Applicable standard
		April 19	April 20	
C1, north of GSTSM	Day	66.1	62.9	60
	Night	60.4	60.8	50
C2, west of GSTSM	Day	50.0	52.3	60
	Night	43.9	36.4	50
C3, south of GSTSM	Day	55.4	50.4	60
	Night	35.1	32.5	50
C4, east of GSTSM	Day	56.9	51.1	60
	Night	36.7	33.4	50
C5, in the project construction site	Day	59.6	57.4	60
	Night	40.5	39.4	50

5) Sound Environment Quality Assessment

It is known from the noise monitoring results that the sound environment in the project school area is subject to significant impacts from its urban function layout, with noise level at the northern boundary not compliant due to significant impacts from traffic noise on Chiyu Road in its adjacency and the sound environment at the other monitoring points of fine quality because it is mainly subject to impacts from domestic noises.

The construction site is located in the campus and, attenuated by roadside buildings and vegetation, the sound environment quality on the project construction site is significantly better, with both daytime and nighttime monitoring results complying with the standard.

4.2 Environmental Protection Objects

The environmentally sensitive protection objects of the proposed project mainly include in-campus teaching buildings, dormitory buildings as well as residential buildings, schools, hospitals and nursing homes in the neighborhood that might be subject to impacts during the construction period of the Project. As a part of the EIA process, sensitive protection objects in the neighborhood of the Project were identified based on the scope of noise impacts during the construction period. Here described as follows are the results:

Noise pollution during the construction period mainly occurs in four construction periods, i.e. the earthwork construction period, the foundation construction period, the structure construction period and the decoration period. The main noise sources are the various kinds of construction plants, e.g. excavators, loaders, trucks in service, etc., mostly producing continuous noise. Noises in the construction period are temporary and restoration is anticipated after the construction is completed. Here shown in the table below are predicted noise source intensity and impacts of noises generated by the key construction plants:

Table 4-7 Noise Values of Key Construction Plants

Construction period	Noise Source	Noise Level [dB(A)]	Distance from Sound Source(m)
Earthwork	Bulldozer	95	1
	Excavator	95	1
	Trucks	90	1
Foundation	Pile driver	85~105	1
	Pneumatic pick	100	1
	Crane	90	1
	Grader	90	1
Structure	Concrete truck-mixer	90	1
	Electric welding machine	95	1
	Trucks	90	1
Decoration (indoors)	Electric drill	100	1
	Electric hammer	105	1
	Hand drill	105	1
	Multifunction carpenter's plane	95	1

Table 4-8 Noise Values of Transportation Vehicles during the Construction Period

Noise source	Heavy trucks	Concrete tank trucks, load-carrying vehicles	Light trucks
Sound Level dB(A)	95	80~85	75

Table 4-9 Prediction of Noise Impacts of Construction Plants (Equivalent Sound Level (LAeq:dB(A)))

SN	Plant	Measuring point distance (m)							Compliance Distance	
		10	20	50	70	100	150	200	Day	Night
1	Drop hammer pile driver	85	78.98	71.02	68.10	65.00	61.48	58.98	57	317
2	Spiral pile driver	75	68.98	61.02	58.10	55.00	51.48	48.98	18	100
3	Hydraulic pile driver	65	58.98	51.02	48.10	45.00	41.48	38.98	6	35
4	Pneumatic pick	80	73.98	66.02	63.10	60.00	56.48	53.98	32	178
5	Excavator	75	68.98	61.02	58.10	55.00	51.48	48.98	18	100
6	Crane	70	63.98	56.02	53.10	50.00	46.48	43.98	10	57

Standard: Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011); 70dB (A) in day and 55dB (A) at night

Note: The noise impact scopes of different types of construction plants in operation are largely different. In order to take account of the worst impacts, prediction during this EIA does not address attenuation by the surrounding buildings and is conducted using the point sound source model in semi-free space. In actual operation, the noise impact scope will be smaller than the prediction results shown in the table above.

It is known from the prediction results of noise impacts of the various representative construction plants that pile drivers and pneumatic picks produce the strongest impacts during the construction period, mainly concentrated in the foundation construction period. With only distance attenuation taken into account but not the influence of building barrier, the ordinary construction plants can meet the daytime noise limits at a distance of 30m in daytime and beyond 100m at night; Different pile drivers produce impacts of significant difference in operation. Predictions show that the conventional drop hammer pile drivers have the biggest scope of impacts, in particular in night time when the compliance distance is as long as 300m away; spiral and hydraulic pile drivers have smaller impacts, with not very large difference from ordinary construction plants, and, therefore, are recommended.

Based on the above noise prediction results, sensitive points within a distance of around 100m around the construction sites will, to a certain extent, be impacted by construction noises and the level of such impacts will be very minor beyond 100m. In association with the above information, sensitive areas around the civil works of the Project were identified as a part of the EIA. Such sensitive areas include teaching buildings and dormitory buildings in campus and residential buildings, schools, hospitals, nursing homes in the neighborhood. See Table 4-10 and Figures 4-4, 4-5 and 4-6 for detail.

Table 4-10 Survey of Environmental Protection Objects in the Surroundings of the Proposed Project

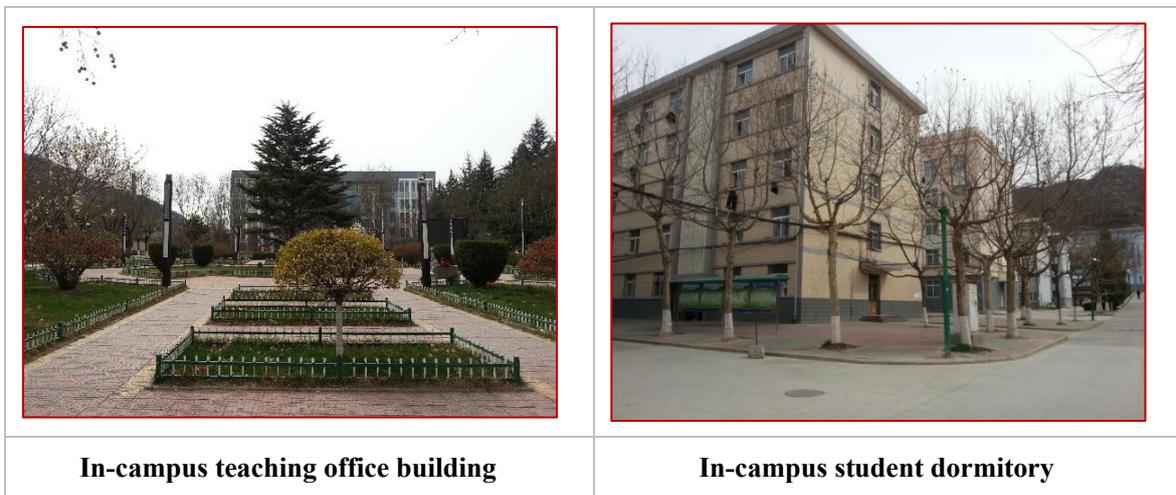
S N	Sensitive Protection Objects	Location	Distance	Environmentally Sensitive Elements	Impacting Period	Affected Person and Scope	Photo
I Gansu Vocational College of Energy and Chemical (LND)							
1	11# Logistics Building	NW	75m	Air, Noise	Construction period	30 persons	Figure 4-5
2	4#Dormitory Building	NW	50m	Air, Noise	Construction period	300 persons	
3	5# Dormitory Building	NW	55m	Air, Noise	Construction period	300 persons	
4	3# Practical Training Building	W	30m	Air, Noise	Construction period	50 persons	
5	19# Building	NW	60m	Air, Noise	Construction period	50 persons	
6	Dormitory Building No.31*	W	35m	Air, noise	Construction Period	250 persons	
7	Dormitory Building No.32*	S	35m	Air, noise	Construction Period	170 persons	
* Note: The implementation period of this project is relatively long, in which the construction of the Dormitory Building No. 33 will be late. At that time, Dormitory Buildings No.31 and No. 32 will be completed and put into use, which may be affected by the construction of Dormitory Building No. 33.							
II Gansu Finance and Trade Vocational College (LND)							
1	2# Student Dormitory Building	N	65m	Air, Noise	Construction period	300 persons	Figure 4-5
2	14# Comprehensive Teaching Building	W	75m	Air, Noise	Construction period	600 persons	
3	Practical Training Building No. 19*	W	32m	Air, noise	Construction Period	200 persons	
4	Second Teaching Building No. 21*	N	55m	Air, noise	Construction Period	170 persons	
5	Area AB of Student Dormitory Building No. 22*	S	20m	Air, noise	Construction Period	170 persons	
* Note: The implementation period of this project is relatively long, in which the construction of the Area AB of Practical Training Building No. 20 and Area C of Dormitory Building No. 22 will be late. At that time, Practical Training Building No.19, Second Teaching Building No. 21 and Area AB of Dormitory Building No. 22 will be completed and put into use, which may be affected by the construction of Area AB of Practical Training Building No. 20 and Area C of Dormitory Building No. 22.							
III Gansu Senior Technical School of Mechanics (Tianshui City)							
1	In-campus library	N	15m	Air, Noise	Construction period	80 persons	Figure 4-6
2	In-campus office building	N	75m	Air, Noise	Construction period	50 persons	
3	In-campus student dormitory building	E	25m	Air, Noise	Construction period	400 persons	
4	In-campus practical training rooms	W	15m	Air, Noise	Construction period	30 persons	
5	All-weather sport ground	S	35m	Air	Construction period	80 persons	
IV Lanzhou University of Arts and Science (Lanzhou City)							

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

1	In-campus teaching office building	SW	70m	Air, Noise	Construction period	300 persons	Figure 4-7
2	Practical Training Base	S	10m	Air, Noise	Construction period	300 persons	
3	Beimiantan New Village	N	95m	Air, Noise	Construction period	Approximately 20 persons in the impact scope	



Figure 4-4 Construction Status of the Sensitive points of LND GVCEC and GFTVC





In-campus practical training rooms

Figure 4-5 Sensitive point Layout and Status Quo Photograph of Gansu Senior Technical School of Mechanics



In-campus teaching office building



Beimiantan New Village

Figure 4-6 Sensitive point Layout and Status Quo Photograph of Lanzhou University of Arts and Science

5. Impact Analysis & Mitigation Measures

5.1 Environmental Impact Analysis and Mitigation Measures in the Construction Period

5.1.1 General impact analysis

(1) Analysis of impacts by exhaust gas pollutants on the surrounding environment

Exhaust gas pollution in the construction period of the Project mainly comes from construction dust, tail gas of construction plants and exhaust gas of organic solvent used in decoration works.

1) Impact analysis of construction dust

In the construction period, dust produces the greatest impact on ambient air quality. Dust can easily arise from loose soil on the ground surface damaged by earthwork excavation and fill and other construction activities in the land use area during construction. Spoil transportation and removal, building material transportation, handling and stockpiling operations may also easily lead to dust. The local climate featuring in little rainfall and dry and windy springs and winters in Gansu Province constitute a driving force of dust generation. Dust easily rises in windy weathers and produces serious impacts on air quality. The amount of dust generated in the construction period is related to many factors, such as wind power, material moisture, operational civilization, stacking and stockpiling methods and particle size and sedimentation velocity of dust particles. The amount of dust generated when construction transportation vehicles travel is related to pavement condition and vehicle speed. Dust generated by vehicles under the action of natural wind normally has an impact range of 100m and can be reduced by around 70% if water is sprayed 4 or 5 times a day over the pavement. Impacts of construction dust can be effectively reduced by means of erecting fencing walls, more frequent water spraying on site roads, reasonable stockpiling of spoil and improved construction management in the construction process. The adverse impacts disappear as the construction period comes to an end.

2) Tail Gas of Construction Plants and Transportation Vehicles

Exhaust gas in the construction period mainly includes exhaust gas emitted by construction plants and tail gas from vehicles and the key pollutants are NO_x, CO and THC. The project area has excellent diffusion conditions and, as the exhaust gas from the construction plants is of a small volume and has a limited scope of impacts, its environmental impacts can be effectively reduced through improving maintenance of the construction plants and minimizing

emission due to mechanical failures.

3) Impact Analysis of Organic Solvent

Organic exhaust gas generated by decoration materials such as paints, latex paints, spray agents and binding agents include formaldehyde, dimethylbenzene and chlorinated hydrocarbons. In the decoration process, it is difficult to estimate the quantities of decoration materials used. It is usually difficult for indoor air to comply with the requirements of the Indoor Air Quality Standard (GB/T18883-2002) immediately after the decoration work is completed. Vitalization of the aforesaid organic exhaust gases mainly occurs in the 3-month decoration period. These organic exhaust gases belong to fugitive emission mainly affecting human health and may be effectively reduced indoors through selection of environment-friendly decoration materials and improvement of indoor ventilation.

(2) Analysis of impacts by wastewater pollutants on the surrounding environment

The key sources of water pollution in the construction period are construction wastewater and domestic sewage generated in the process of construction plant and transportation vehicle washing and ground pit excavation.

Analysis of water quality monitoring results in the construction period of similar previous projects shows that the key pollutants contained in such construction wastewater are SS, COD, BOD₅ and petroleum. Sedimentation tanks may be provided on the construction site for sedimentation of such construction wastewater, with the supernatant water recycled.

Based on comparison of domestic sewage in similar construction conditions, during the construction of the project school components, 20 construction workers will be mobilized on site to the maximum and the Project will produce 0.64 t/d of wastewater with an assumed water consumption of 40L/ day per construction worker and domestic sewage generation calculated as 80% of the daily water consumption. Such wastewater is mainly domestic sewage generated by the construction workers and generally contains no toxic substances. Each project school will produce approximately 460.8 tons of domestic sewage in a construction period of 24 months.

The pre-treatment concentrations of the key pollutants are determined as follows based on the statistics of effluent concentration of these pollutants in domestic sewage: 400mg/L for COD_{Cr}, 200mg/L for BOD₅, 220mg/L for SS, and 25mg/L for NH₃-N. In such a context, the production of water pollutants of COD, BOD₅, SS and NH₃-N is respectively 0.512kg/d, 0.256kg/d, 0.282kg/d and 0.032kg/d in the construction period and the total volume of such water pollutants generated by each project school in the construction period is respectively

184.32kg, 92.16kg, 101.38kg and 15.36kg.

Domestic sewage generated in the construction period is collected and treated via the existing wastewater collection pipeline or self-built domestic sewage collection tanks of the schools, producing little environmental impacts.

(3) Analysis of impacts by noise on the surrounding environment

In this EIA, the key noise pollution sources and intensities are analyzed and determined based on different stages of construction. See Table 5-1 for detail.

The key noise sources in the earthwork construction stage are bulldozers, excavators, loaders and transportation vehicles while those in the foundation construction stage are compactors, cranes and graders. Cutters are the main noise-generating equipment in the structure construction stage.

Since most of the construction activities in the decoration stage are carried out inside the buildings and the construction noise is reduced to a certain extent by the walls, noise impacts produced in this part of the construction process are insignificant.

Table 5-1 Noise Values of Key Construction Plants

Construction period	Noise Source	Noise Level [dB(A)]	Distance from Sound Source(m)
Earthwork	Bulldozer	95	1
	Excavator	95	1
	Trucks	90	1
Foundation	Pile driver	85~105	1
	Pneumatic pick	100	1
	Crane	90	1
	Grader	90	1
Structure	Concrete truck-mixer	90	1
	Electric welding machine	95	1
	Trucks	90	1
Decoration (indoors)	Electric drill	100	1
	Electric hammer	105	1
	Hand drill	105	1
	Multifunction carpenter's plane	95	1

Table 5-2 Noise Values of Transportation Vehicles in the Construction Period

Noise source	Heavy trucks	Concrete tank trucks, load-carrying vehicles	Light trucks
Sound Level dB(A)	95	80~85	75

Table 5-3 Prediction of Noise Impacts of Construction Plants (Equivalent Sound Level (LAeq:dB(A)))

SN	Plant	Measuring Point Distance (m)							Compliance Distance	
		10	20	50	70	100	150	200	Day	Night
1	Drop hammer pile driver	85	78.98	71.02	68.10	65.00	61.48	58.98	57	317
2	Spiral pile driver	75	68.98	61.02	58.10	55.00	51.48	48.98	18	100
3	Hydraulic pile driver	65	58.98	51.02	48.10	45.00	41.48	38.98	6	35
4	Pneumatic pick	80	73.98	66.02	63.10	60.00	56.48	53.98	32	178
5	Excavator	75	68.98	61.02	58.10	55.00	51.48	48.98	18	100
6	Crane	70	63.98	56.02	53.10	50.00	46.48	43.98	10	57
Standard: Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011); 70dB (A) in day and 55dB (A) at night.										
Note: The noise impact scopes of different types of construction plants in operation are largely different. In order to take account of the worst impacts, prediction during this EIA does not address attenuation by the surrounding buildings and is conducted using the point sound source model in semi-free space. In actual operation, the noise impact scope will be smaller than the prediction results shown in the table above.										

It is known from the prediction results of noise impacts of the various representative construction plants that pile drivers and pneumatic picks produce the strongest impacts in the construction period, mainly concentrated in the foundation construction stage. With only distance attenuation taken into account but not the influence of building barrier, the ordinary construction plants can meet the daytime noise limits at a distance of 30m in daytime and beyond 100m at night; Different pile drivers produce impacts of significant difference in operation. Predictions show that the conventional drop hammer pile drivers have the biggest scope of impacts, in particular in night time when the compliance distance is as long as 300m; spiral and hydraulic pile drivers have smaller impacts, not very significantly different from ordinary construction plants, and are, therefore, recommended.

With the characteristics of high intensity and short duration, noise impacts in the construction period may be mitigated through strict control of construction time and improved operation and management of construction plant in the construction stage. Impacts of construction noise will no longer exist as the Project is completed. The adverse environmental

impacts caused by construction noises are temporary and short and no long-lasting and accumulative impacts will be generated. Therefore, impacts from construction noises on the surrounding environment are insignificant.

(4) Analysis of impacts by solid wastes on the surrounding environment

Solid wastes generated in the construction period mainly include construction debris and construction solid wastes generated in the construction process and domestic solid wastes generated by the construction workers.

1) Construction solid wastes generated from construction activities

The amount of construction solid wastes generated from construction activities is predicted based on building area evolution as follows:

$$J_S = Q_S \times C_S$$

Where:

J_S : total amount of construction solid wastes generated (t)

Q_S : Total building area of the newly constructed components (m^2), 155,094.17 m^2

C_S : Amount of construction solid wastes generated per m^2 of building area, 0.06t/ m^2

2) Construction solid wastes generated from demolition activities

Comparison with construction solid wastes generated by similar demolition projects shows that residential houses with brick-&-concrete structure usually generate 1.3t construction solid wastes per square meter. Gansu Senior Technical School of Mechanics involves the demolition of 1 old building with a building area of approximately 400 m^2 and, therefore, will generate approximately 520 t construction solid wastes.

Calculation using the above formula shows that, in the construction of the Project, approximately 12,096.17 tons of construction solid wastes will be generated. See Table 5-4 for details of the amount of construction solid wastes to be generated from each school. The project schools should assure proper disposal of such construction solid wastes following the requirements of the local environmental protection authorities.

Table5-4 List of Estimated Amount of Construction Solid Wastes to be Generated by Each School under the Proposed Project

Name of School	Building Area (m ²)	Amount of Construction Solid Wastes to be Generated (t)
Gansu Vocational College of Energy and Chemical	74295.07	4457.704
Gansu Finance and Trade Vocational College	77759.11	4665.547
Gansu Senior Technical School of Mechanics	34782	2606.92
Lanzhou University of Arts and Science	6100	366
Total	192936.18	12096.17

2) Earthwork Spoil

The proposed project involves a total earthwork excavation of approximately 40,247.6m³, backfill and leveling fill of 49,541.11m³ and earthwork transfer and reuse of 15,415.89m³ and spoil disposal of 6122.38m³ in the construction period. The project schools should assure proper spoil disposal according to the requirements of local environmental protection authorities.

3) Domestic Solid Wastes

The amount of domestic solid wastes is predicted based on population evolution as follows:

$$W_s = P_s \times C_s$$

Where:

W_s: amount of domestic solid wastes generated (kg/d)

P_s: Total number of construction workers, 20 persons

C_s: Amount of domestic solid wastes generated per capita (1kg/d-person)

Calculation using the above formula shows that, in the 24-month construction period of the Project, approximately 0.02 tons of domestic solid wastes will be generated per day and the amount of domestic solid wastes to be generated in total by the project schools will be 14.6 tons. The project schools should assure proper collection and treatment of such domestic solid wastes following the requirements of the local environmental protection authorities.

Solid wastes generated in the construction period are ordinary solid wastes. In order to avoid secondary pollution, the construction contractors must strengthen management and develop a reasonable plan to achieve classified collection and timely removal of construction solid wastes. The earthwork spoil and construction solid wastes should be transported to stockpiling sites designated by the environmental sanitation authority to reduce temporary

storage on site; domestic solid wastes should be removed out of site by the end of each day and transported by the construction contractors to designated sites for disposal. Impacts generated by solid wastes on the surrounding environment are insignificant.

(5) Impacts on Ecological Environment by the Construction Activities

Site excavation in the construction process will result in a certain area of disturbed surface and relatively significant damages to the existing native land, further leading to increase of fragmentation, change of soil particle size and aggravation of soil erosion.

Impacts on vegetation caused by construction works are mainly reflected in the damages to surface vegetation in the operation area from activities of surface excavation, transportation and stockpiling of construction materials and production equipment as well as rolling of construction plant and vehicles and trampling by the construction workers.

(6) Environmental Impacts Generated by Construction Sites

Construction camps, construction material storage and transportation, construction time and construction vehicles will generate impact of different levels on the local environment. Construction camps and construction material storage require occupation of land on campus and generate significant impacts on vegetation and environment on campus in the affected area; construction vehicles, construction material transportation and construction plants and equipment generate noise and traffic jam generate significant impacts on the objects of sound environment protection and road transportation in the project schools and their neighborhood. Such impacts will be maximized in particular when the construction time is not reasonably scheduled or overtime work is involved. In addition, construction wastewater and exhaust gas generated by construction plants and equipment will have certain impacts on local surface water and air environment.

Construction sites generate relatively significant environmental impacts, which are however limited in certain time and will disappear as the construction works are completed.

(7) Construction Safety & Health

Since the construction sites of the Project are located on campus, teachers and students on campus may easily be exposed to health and safety hazards if construction site planning and construction management are not reasonably implemented in the construction period. The construction contractors and supervision agencies are responsible to take all reasonable actions to protect the personal safety of construction workers and teachers and students on campus and the physical safety of buildings in the neighborhood from unexpected constructional hazards. Therefore, in the process of tendering and bidding, the contractors must enforce the

management regulations on construction safety and health included in the appraisal report, organize relevant training in a timely manner and incorporate such requirements into the procurement documents.

5.1.2 General Pollution Control Measures

To address the adverse impacts generated by the civil works of the project school components on air environment, water environment, sound environment and solid wastes, the following prevention and mitigation measures are proposed:

5.1.2.1 Ambient air pollution control measures

(1) Dust pollution control

The key sources of construction dust include dust brought by vehicles travelling on construction sites, dust generated by construction and decoration materials and earthwork stockpiling, dust generated in the transportation process of earthwork, debris and construction solid wastes and dust generated in mortar mixing operation.

Regarding the aforesaid dust pollution sources, the following dust pollution control measures are proposed:

1) First of all, to manage the construction activities on site, a construction site environmental protection responsibility system should be set up, with the Project Manager as the primary responsible person, and environmental protection measures and special program for construction dust control must be included in the construction organization design, which should not be put into implementation until approved by the competent authority.

2) Dust screens and fences should be set up for the building structures according to the respective specification to reduce the possibility of construction dust;

3) Ground surface of the construction sites and traffic roads should be hardened and sprayed with water for dust suppression;

4) Vehicle washing equipment should be installed at entrances and exits of construction sites to make sure all transportation vehicles are washed and cleaned and dust and dirt are removed before leaving site to keep the access roads and the surrounding area in a clean condition;

5) Proper covering or other effective dust prevention measures should be implemented on construction sites where construction solid wastes cannot be removed in time by the required deadline;

6) Slurry tanks and slurry troughs should be provided on construction sites involving

slurry operation to prevent slurry spillage. Waste slurry should be transported out of site in closed tankers;

7) Pre-mixed concrete and pre-mixed mortar should be used on construction sites according to the respective requirements and in-situ open-air mixing is prohibited;

8) During earthwork excavation and backfill operations, water should be sprayed for dust suppression and to reduce the duration of dusty operation; in case of winds above Grade 4, no earthwork construction and demolition operations should be implemented;

9) Construction materials, sand and gravel, soil and other dust-generating materials stockpiled on site should be covered with dust screen or cloth and dust suppression agent or water should be sprayed on a periodical basis to prevent wind erosion and dust generation;

10) Bulk materials, construction solid wastes and debris conveyed on and over buildings and structures should be put in closed containers and tossing and throwing from high altitude is prohibited.

11) Dense dust screen or cloth with excellent dust suppression effect should be installed outside the scaffolds during building construction and dust prevention measures such as water spraying, mist spraying should be taken during building demolition.

12) Vehicles transporting construction solid wastes and debris should be washed and cleaned in time to make sure that they are clean when leaving the sites; transportation vehicles should be properly covered to achieve air-tight transportation and prevent possible spillage and leakage on roads.

13) Construction sites should be 100% fenced up; material stockpiles 100% covered; vehicles 100% washed; construction site surface 100% hardened; demolition sites 100% adopting wet operation method and debris transportation vehicles 100% achieving air-tight transportation.

(2) Vehicle Tail Gas

1) Construction plants and vehicles in good operating condition should be selected;

2) Fuel-driven construction plants and vehicles must be operated in normal condition to assure compliant tail gas emission;

3) Equipment should be used in a reasonable way and equipment maintenance and repair should be strengthened.

(3) Decoration Exhaust Gas

1) Environment-friendly decoration materials should be selected;

2) Doors and windows should be opened after the decoration work is completed for effective ventilation.

3) Indoor air quality monitoring should be conducted before the school buildings are put into service to assure that they are not occupied until full compliance is achieved.

5.1.2.2 Water Pollution Control Measures

Wastewater generated in the civil works construction process of the project schools mainly comprises of construction wastewater and domestic sewage of construction workers as well as intermittent stormwater. The construction and production wastewater mainly includes wastewater from mortar mixing, water permeated from ground pit excavation, wastewater from construction plant washing and wastewater containing machine oil and grease. Regarding the aforesaid wastewater, the following discharge control measures are proposed:

(1) Stormwater Management

1) A sound stormwater and drainage system is already in place in each project school. During construction, the stormwater collection gutters must be kept unblocked and no construction materials should be stockpiled over and adjacent to the stormwater collection gutters to avoid possible obstruction.

2) Soil contaminated (e.g. by oil, grease or paints) in the construction period should be removed in time to prevent massive contamination of stormwater.

3) The construction contractors are encouraged to use weather forecast and rainstorm warning functions to respond to any upcoming adverse rainfall conditions.

4) During rainfalls, timely attention should be paid to make sure that the stormwater collection gutters and drainage pipelines remain unblocked and any obstructions are removed in time.

(2) Construction Wastewater

1) Wastewater from vehicle cleaning and washing, construction material washing, concrete curing and aggregate washing on construction sites should be collected via the gutters and then mixed and diluted to reduce wastewater pH value before such wastewater enters the temporary sedimentation tank for treatment. The temporary sedimentation tank should have an adequate size to guarantee 12-hour wastewater retention as specified in the standard and the treated wastewater should be fully reused in construction site cleaning, construction material washing, concrete curing and aggregates re-washing;

2) Muddy stormwater and slurry water should be collected into the sedimentation tank

for sedimentation and reuse;

3) Machine oil leaked from machinery and wastewater from equipment and material washing should be settled in oil separating tank before reuse to control impacts from sediments and suspended substances contained in the construction wastewater on the surrounding environment;

4) The oil separating tanks and sedimentation tanks should be subject to proper anti-seepage treatment to avoid possible impacts on the surrounding environment.

5) Oil or water leaks must be inspected and repaired before any mechanical equipment is used.

(3) Domestic sewage

1) Temporary toilets, septic tanks and wastewater collection tanks should be provided on construction sites. Laundry and kitchen wastewater generated by the construction workers should be subject to oil separation and sedimentation before discharged into the school sewage pipelines. Night soil generated in the temporary toilets should be stored in septic tanks temporarily before removed by the local environmental sanitation authority on a periodical basis.

2) In order to prevent possible pollution of ground water, anti-seepage cement should be used in the foundation construction of the wastewater collection tanks.

3) Environmental protection education for construction workers should be strengthened to promote environmental awareness and prevent uncontrolled littering and wastewater discharge.

5.1.2.3 Noise Pollution Control Measures

Noises in the construction period mainly include noises of construction plants and transportation vehicles on construction sites. Such noises have relatively high intensity and the key control measures include reasonable planning of construction sites, assuring normal operation of construction plants and reasonable scheduling of construction time, etc.

1) Reasonable planning of construction sites

The number of construction plants mobilized on site should be minimized provided that the constructional need is satisfied. Steel rebar and steel sheet processing should be outsourced, if possible, to reduce noise source from on-site processing; the implementation agency should develop a comprehensive plan to arrange the noise sources at a centralized location where possible to reduce the scope of construction noise impacts.

2) Assuring normal operation of construction plants

State-of-the-art low-noise equipment should be selected if possible; high-noise equipment should be used at lower frequency and low-noise pneumatic or spiral pile drivers should be used for pile driving; high-efficiency silencers should be installed on loaders, excavators and other mobile noise sources and honking should be banned on construction sites to avoid and reduce noise disturbance. The construction contractors should conduct periodical inspection and maintenance of the construction plants in the construction process to assure normal operation and avoid high-intensity noises generated from operation of defective equipment.

High-noise mechanical equipment should be located away from the side adjacent to residential areas and noise-reduction fences should be set up on construction sites located in a distance of less than 5m from residence, hospital and school buildings.

3) Reasonable scheduling of construction time

① The construction time should be reasonably scheduled to have high-noise construction periods (e.g. foundation construction) arranged in winter or summer holidays if possible. Otherwise, the construction activities should at least be coordinated with the teaching activities to, e.g. have high-noise construction activities arranged in afternoons or weekends to avoid operation of high-noise equipment in time periods for concentrated teaching and student rest.

② The construction sequence should be reasonably arranged and no construction should occur in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day.

③ When continuous construction is needed, a request should be submitted to the local environmental protection authority. Night construction must not be implemented without prior approval and without the acknowledgement by schools and residents in the neighborhood. High-noise equipment should be arranged for daytime construction and the standards specified in Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011) should be strictly enforced.

(4) Construction Vehicle Noise Control Measures

① Stronger efforts should be made in transportation management. The implementation agency and the construction contractors should negotiate on environmental protection education for transportation workers. The speed of transportation vehicles should be controlled and overloading banned.

② Vehicle maintenance and repair should be strengthened to assure normal operation;

③ Direction boards should be provided at entrances and exits of construction sites and unnecessary idle speed, braking, ignition and honking should be avoided.

④ Transportation vehicles are banned to travel in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day to assure normal resting of local residents.

⑤ Traffic noise may generate certain impacts on sound environment sensitive points in the neighborhood. Therefore, the construction contractors should promote the environmental protection awareness of the construction workers, learn about the local customs and habits and reasonably arrange transportation time. In centralized residential areas and other environmentally sensitive areas, speed limit, horn prohibition and other self-conscious actions should be taken to control vehicles and other construction plants so as to prevent and reduce noise impacts.

⑥ Transportation vehicles should travel in low speed on campus to not only reduce impacts by traffic noise on teaching activities, but also protect personal safety on campus. Vehicles traveling on campus should strictly follow the planned route. Random parking and honking are prohibited.

(5) Decoration Noise Control Measures

When it is unlikely to implement the decoration works in a centralized time period, management of decoration noise should be strengthened and strict decoration management measures should be developed to minimize impacts caused by decoration noises. Doors and windows should be properly closed while decoration work is going on. The decoration time period should be limited and no decoration activity of any kind should be conducted in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day.

5.1.2.4 Solid Waste Pollution Control Measures

Solid wastes in the construction period mainly include domestic solid wastes generated by construction workers and construction solid wastes generated in the construction process. In order to reduce impacts on surrounding environment by the construction solid wastes, this EIA proposes the following measures:

1) Construction Solid Wastes

① Construction solid wastes generated in the construction period should be removed in time to avoid secondary pollution in the process of stockpiling.

② Some package bags generated in the construction process need to be classified and stockpiled, with the reusable parts adequately recycled and the other parts incorporated into and treated together with domestic solid wastes.

③ Earthwork construction should be carefully designed and organized to achieve

substantial earthwork excavation and fill balance and avoid long haulage; waste concrete and bricks discarded on site should be removed in time.

④ Solid wastes should be subject to classified treatment. Reusable construction solid wastes, such as steel rebar, should be recycled to avoid waste of resources while the non-reusable construction solid wastes need to be dumped at designated sites.

⑤ Vehicles transporting bulk materials and wastes should be properly sealed, fastened and covered to avoid spillage on the way; vehicles transporting soil should travel along designated route in the specified time period. Spoil disposal should be conducted in a concentrated period and avoid storm season and be accompanied with simultaneous compacting.

⑥ Vehicles transporting construction solid wastes and debris should be washed and cleaned in time to make sure that they leave the sites clean and tidy; transportation vehicles should be properly covered to achieve air-tight transportation and prevent possible spillage and leakage on roads.

⑦ Vehicle washing equipment should be installed at the entrances and exits of construction sites to make sure all transportation vehicles are washed and cleaned and dust and dirt removed before leaving site to keep the access roads and the surrounding area in a clean condition;

⑧ The project schools should strictly abide by the requirements of local authorities on treatment of construction solid wastes.

2) Domestic solid wastes

The construction contractors should properly carry out the collection and stockpiling of domestic solid wastes and remove the domestic solid wastes out of the construction sites in a timely manner. Education to the construction workers should be strengthened and civilized construction should be promoted to put an end to uncontrolled dumping of domestic solid wastes and assure the environmental quality on construction sites and the surrounding areas. Closable classified garbage bins should be provided in the temporary living areas and the domestic solid wastes should be collected and transported on a daily basis to the adjacent garbage collection stations and then by the environmental sanitation authority to municipal domestic solid wastes landfills for hygienic landfill.

(3) Management Requirements for Waste Paint Buckets

During the decoration of school buildings, paint will be used to varying degrees, and all construction units will face the problem of temporary storage and disposal of waste paint buckets generated after the paint is used up.

According to the *National Hazardous Waste List* (2021), used-up waste paint buckets fall under the category of "Non-specific Industries" in "HW12 dyestuff and paint wastes" and "900-252-12 paint (excluding water-based paint), organic solvents for painting, the waste generated in the process of painting". According to the storage requirements of hazardous wastes in the Technical Specifications for Collection, Storage and Transportation of Hazardous Waste (HJ 2025-2012), the temporary storage sites of waste paint buckets generated during decoration fall under the category of "Facilities Used for Temporary Storage by Hazardous Waste Generating Units". Therefore, waste paint buckets need to be stored separately. According to the requirements of the Pollution Control Standard for Hazardous Waste Storage (GB 18597-2001, 2013 Amendment), the temporary storage site of waste paint buckets is forbidden to be close to the protection area prone to kindling and high voltage electricity. Warning signs should be set up in the storage site and rainproof, fire prevention and seepage prevention measures should be taken. The temporary storage site should be equipped with lighting and fire fighting facilities. At the same time, the construction unit should establish a collection, transfer and storage ledger to record the whole process from the generation, collection and temporary storage of waste paint buckets until they are delivered to the manufacturer for recycling. See Table 5-5, Table 5-6 and Table 5-7 for detailed record tables.

Therefore, the construction units of all project schools should give priority to water-based paint. If non-water-based paint is required, the waste paint buckets should be managed in strict accordance with the "Management Requirements for Waste Paint Buckets" in this report.

Table 5-5 Record of Hazardous Waste Collection

Collection Location		Collection Date	
Type of Hazardous Waste		Name of Hazardous Waste	
Quantity of Hazardous Waste		Form of Hazardous Waste	
Packaging Form		Temporary Storage Location	
Subject of Responsibility			
Correspondence Address			
Contact No.		Zip Code	
Collection Unit			
Correspondence Address			
Contact No.		Zip Code	
Signature of Collector		Signature of Responsible Person	

Table 5-6 Record of Transfer in Hazardous Waste Generating Unit

Enterprise Name:

Type of Hazardous Waste		Name of Hazardous Waste	
Quantity of Hazardous Waste		Form of Hazardous Waste	
Place of Generation		Collection Date	
Packaging Form		Packing Quantity	
Transfer Batch		Transfer Date	
Transferred by		Received by	
Subject of Responsibility			
Correspondence Address			
Contact No.		Zip Code	

Table 5-7 Handover Record of In-warehouse and Ex-warehouse of Hazardous Waste

Warehouse Name:

Type of Hazardous Waste		Name of Hazardous Waste	
Source of Hazardous Waste		Quantity of Hazardous Waste	
Characteristics of Hazardous Waste		Packaging Form	
In-warehouse Date		Storage Location	
Ex-warehouse Date		Receiving Unit	
Handler		Contact No.	

5.1.2.5 Ecological Impact Mitigation Measures

(1) Ecological Resource Protection and Management Measures

① Construction site layout and arrangement should be reasonable and optimized to minimize the scope of construction activities and land damages caused during project implementation;

② Bricks, stone, sand, cement, timber among other construction materials needed and outsourced for the construction works should be transported to the construction site at time intervals and in loads roughly matching the actual demand on site to minimize land area

occupied by material stockpiles; upon completion of the construction works, residual materials should be removed out of site in time to enable landscaping of construction sites;

③ Temporary protective fences should be erected around trees remaining on the construction site before the construction works commence based on the results of construction site investigation;

④ Neither should the trees be attached with marks and labels other than the identification label nor should the tree protection zones have construction materials stockpiled or stored and construction plants and equipment parked in their immediate adjacency;

⑤ Temporary intercepting ditches should be constructed on construction sites and floodways should be built to replace surface runoff passage damaged by the Project to divert rain season flood and prevent the construction works from erosion by surface runoffs;

⑥ On the premise that construction quality is assured, the construction contractors should take all possible actions to shorten the time of temporary land occupation, control the construction time of earthwork and maintain stable cut and filled slope to minimize impacts outside the scope of the construction works.

(2) Soil Erosion Control Measures

1) Engineering Measures

① Leveling and backfill: including measurement of backfill area and depth, backfill bulk density and rolling bulk density, determination of backfill rolling method, determination of forecast and protection measures of possible subsidence and its hazards;

② Planning of transportation routes of backfill material and top soil;

③ Depression backfill and utilization: waste soil and ballasts should be adequately utilized for depression backfill so that the depressions are properly backfilled and leveled and waste materials are used up. Terrain, construction conditions and area among other factors should be considered upon determining backfill method. Normally, manual backfill and mechanical backfill are integrated and used simultaneously, with bulldozers used to level off large depressions in rectangular partitions and manual methods used to handle small depressions, corners and edges that are not accessible for mechanical operation;

④ Upon rough leveling, the key backfill positions should be identified first based on the terrain and topographical features and the backfill height of the project area. Then, bulldozers or other construction plants are used to move the fill materials to the depression backfill zone.

During backfill operation, the fine and particulate sand and gravel materials should be placed on bottom layers while aggregates of larger particle sizes on the top before rolling and compacting. After rough leveling is over, shovels and spaces should be used to manually handle and level off the disturbed edges and corners of the construction zones and small depressions left over from mechanical leveling until the final leveling effect required in the design document is achieved.

2) Temporary Measures

Since the civil works of each project school are of a large scale, it is necessary to stockpile the sand and aggregates needed for building foundation excavation, backfill and construction works for a long time. In order to avoid wind and water erosion, it is necessary to have the stockpiles temporarily covered and protected. Such temporary covering and protection measures include temporary covering with dust screen, water spraying, etc.

① Covering

Temporary covering measures should be taken to prevent the exposed parts of the temporary stockpiles from wind and water erosion. Dense dust screen may be selected as the covering material. Dust screen should not be removed until the earthwork backfill commences and should be rolled up backward from the ground pit position and fully removed and recovered after the backfill operation is completed.

② Water spraying

1 or 2 passes of water spraying should be conducted on the leveled construction sites. When the water infiltration depth reaches about 2cm, a surface crust with an effective wind erosion resistance thickness will be formed to facilitate restoration of water and soil conservation function.

3) Vegetation Measures

Native species should be selected for vegetation restoration on construction sites and spoil disposal areas upon the completion of the construction works. Introduction of alien species should be avoided.

5.1.2.6 Construction Site Management Measures

The construction contractors of the Project must strictly enforce the following management measures to minimize the adverse environmental impacts generated on the construction sites.

(1) Working hours

The working hours on the construction sites are 7:00 am to 22:00 pm. Construction is banned during the noon hours of 12:00 to 14:00 and restricted at night. Where night construction becomes inevitable, a notice should be given to the local residents and relevant formalities fulfilled and actions taken to reduce impacts on residents. The arrival and departure time of construction transportation vehicles must comply with the requirements of local governments;

(2) Construction camp arrangement

If possible, the construction contractors should rent local residential houses in the project area for lodging and accommodation and avoid locating the construction camps and canteens on the construction sites, where only offices and material stockpiling sheds are allowed.

(3) Traffic safety

1) Best traffic safety practices should be adopted in all aspects related to transportation during the construction of the Project to best avoid traffic accidents and reduce casualty of both project personnel and general public. In such a context, the following measures should be taken:

① Drivers should be made particularly aware of the importance of safety rules;

② Driving skill should be improved and all drivers must be licensed;

③ Driving time should be limited and driver duty shift schedule developed to avoid fatigue driving;

④ Dangerous road sections and driving in the dangerous hours of a day should be avoided to minimize accident probability;

2) Vehicle maintenance should be conducted on a periodical basis and manufacturer approved spare parts used to avoid serious traffic accidents resulting from equipment failure or premature failure of parts and components.

3) All efforts should be made to reduce simultaneous occupation of roads by pedestrians and construction vehicles;

4) Road signs and visibility should be improved in cooperation with local communities and competent authority to promote the level of road safety as a whole, in particular on roads adjacent to schools and other areas where children are present. Traffic and pedestrian safety education campaigns (e.g. advertisement activities in schools) should be organized in cooperation with local communities;

5) A mechanism should be established for coordination with the emergency response personnel to assure that appropriate first aid is available in case of any accidents;

6) Local materials should be used where possible to shorten haulage. The relevant facilities (e.g. worker dormitories) should be located adjacent to the project sites to avoid increase of traffic flow;

7) Traffic safety control measures should be taken and road signs and signalmen should be used to warn pedestrians and traffic against dangers.

(4) Spoils and Construction Solid Wastes

Spoils and construction solid wastes should be stockpiled at landfills designated by local environmental sanitation authority and should not be dumped at free will.

(5) Public Information Platform

① Construction data plates should be installed at obvious positions to indicate the project name, construction site area, names of project implementation agency, construction contractors and supervision and administration agencies as well as names of project responsible person, dates of construction commencement and completion, complaint hotline and specific environmental protection measures;

② The construction contractors should post a Notice of Project Commencement around the construction site 7 days before the scheduled date of project commencement to disclose information including project overview, construction plan, names of respective construction units and name of project responsible person, complaint hotline, etc.;

③ Night construction should be restricted. When night construction is inevitable under special circumstances, actions should be taken to control the impacts of night construction on the surrounding environment and a prior notice should be given to the local residents to seek their understanding;

④ The construction contractors should post notices around the project sites and the premises of affected residents and enterprises to notify the public of pending interruption of services (including water supply, electricity supply, telecommunication and traffic, etc.) 5 days in advance.

(6) Prevention of Accidents and Risks

The construction contractors should develop an accident prevention plan and assign an emergency responsible person and seek aids from the concerned authorities immediately upon the occurrence of any accidents;

(7) Personal Safety and Health

The construction sites should be separated and fenced up and traffic signs and guardrails provided to assure pedestrian safety; safety training should be provided to the construction

workers before construction commences; personal protection devices must be provided and mandatorily used; all construction activities should be suspended in case of a rainstorm or any emergency accidents;

(8) Prohibited Activities

Unapproved tree felling outside the approved construction site is prohibited; use of unapproved toxic substances, including lead paint, asbestos, open flame and alcohol, is prohibited.

5.1.2.7 Construction Safety and Health Measures

The construction contractors are responsible for following the World Bank EHS Guidelines and all the national and local safety requirements and implementing other accident prevention measures to assure the safety and health of construction workers.

① All the buildings on construction sites should be kept in good integrity; the temporary buildings and structures should be structurally safe and reliable to resist impacts of local bad weathers and have appropriate sunlight and proper facilities for partial isolation of dust and noises; the floors should be kept level, flat and skip-resistant.

② The construction contractors should assure availability of first aid complying with the respective standard. Appropriate first aid toolkits should be provided on construction sites; a written emergency response procedure should be available and cover the full process till the patients are finally transferred to an appropriate medical institution.

③ Occupational health and safety training should be provided to all new construction workers to introduce to them the basic working rules and personal protection rules on construction sites and teach them how to prevent injuries to other workers; the training contents should include basic knowledge of hazards and dangers, specific hazards present in work places, codes of safe operation, fire emergency response procedures, evacuation procedures and natural disaster response procedures (the final contents will be determined based on actual needs). The training should include detailed introduction of specific hazards and their color codes in work places.

④ Correct signs should be provided in hazardous areas (e.g. power distribution rooms, etc.), devices, materials, safety measures and emergency exits and actions should be taken to prevent unauthorized access to such areas; the signs should conform to the international standards and be easy to understand for staff, visitors and general public (to be determined depending on actual circumstances).

⑤ If a worker holding a handheld or electrical tool feels vibrations on his/her hands and

arms or a worker standing or sitting on a vibrating surface feels vibration in the whole body, such vibration should be controlled through equipment selection, installation of vibration reduction gaskets or devices or limiting exposure time;

⑥ Appropriate personal protection devices should be determined and provided by the construction contractors to the construction workers to assure that the workers, their colleagues and occasional visitors are adequately protected and no unnecessary inconvenience is caused to the users;

⑦ Clamping hazards should be eliminated upon design of machinery and actions should be taken to prevent possible physical harms by the machinery projections in normal operation;

⑧ Warning signs should be installed on all live electrical devices and wires; all the electricity wires, cables and handheld electrical tools should be inspected to identify any damaged or exposed wires and the maximum allowable working voltage of handheld tools should be determined according to the manufacturer's recommendations; all electrical equipment used in humid (or possibly humid) environment should be equipped with double insulation / grounding; all electrical wires buried under the ground should be identified and marked before any digging operation commences.

⑨ Actions should be taken to prevent the construction workers from overexertion. Training should be provided to workers on how to correctly move and handle materials during construction and demolition activities, including specifying the upper limit of load a single operator can handle (and the requirement of mechanical aid or double operation beyond the upper limit) ; The layout plan of the construction site should be so developed to avoid, to the best possibility, needs for manual movement of heavy objects; tools should be so selected and work table so designed to reduce, to the best possibility, the level of force and the duration of handholding needed and facilitate the workers to keep the correct position (and, when necessary, use the users' and adjusted worktable).

⑩ Actions should be taken to prevent trip-over and fall-over. A sound site cleaning and management system should be implemented to, for example, classify the scattered building materials and demolished parts and place them in areas away from walkways, remove excessive wastes and spilled liquids on a periodical basis, place electrical wires and ropes in public areas and labeled corridors and use skid-resistance mats.

⑪ Safety protection requirements for high-altitude operation: Temporary fall protection measures should be taken, e.g. providing handrails and foot baffles around scaffolds and at the edges of other high-altitude operation areas to prevent fall of materials; training should be

provided to the workers on actual operation of the fall prevention devices which are used during operations of high altitude of or more than 2m from the ground or on occasions with the possibility of falling into machines in operation, water or other liquids or hazardous substances or falling from an opening on the working face; training should be provided to the workers on actual operation of personal fall prevention equipment, e.g. full-body harness and buffering lanyard capable of carrying a load of 5000lb; rescue procedures should be developed to rescue workers successfully prevented from falling. The connecting points of fall prevention equipment should also be able to carry a load of 5000lb; control zone and safety supervision system should be set up to warn the workers against the presence of a fall hazard zone in the adjacency and covers of openings on floors, ceilings and walkway pavements should be reinforced, marked and indicated.

⑫ Safety protection requirements on preventing hit by objects: Solid wastes should be discarded and discharged at designated and restricted areas. Wastes should be conveyed safely through the chutes from upper floors to lower floors; appropriate protective devices and fastening methods should be used during sawing, cutting, welding, grinding, polishing, chiseling and carving operations; passages and corridors should be kept unblocked and actions should be taken to avoid heavy-duty machinery travelling on scattered wastes; temporary fall protection measures should be taken, e.g. providing handrails and foot baffles around scaffolds and at the edges of other high-altitude operation areas to prevent fall of materials; appropriate personal protection devices (e.g. safety glasses with protective edges, masks, safety helmets and safety boots) should be used.

⑬ Safety protection requirements for moving machinery: The vehicle travelling, machinery operation and personnel walking areas should be planned and zoned; one-way traffic rules should be adopted to control vehicle traffic; speed limit should be stipulated; and on-site traffic should be guided by trained signalmen (wearing obvious vests or jackets); Personnel working or walking in the operation zones of heavy-duty machinery should wear visible vests to increase visibility and training should be provided to teach workers how to have eye contacts with equipment operators before approaching a vehicle in operation; it should be assured that back-up buzzers are installed on moving equipment; hoisting equipment (e.g. cranes) should be properly inspected, maintained and confirmed suitable to move on road before they are used to lift heavy objects up to a higher working level for fastening.

⑭ Dust protection requirements: All dust removal methods, e.g. water spraying or non-toxic chemical agents, should be used to reduce dust raised by vehicles; where excessive amount of dust is present, personal protection devices (e.g. dust masks) should be used.

⑮) The construction contractors should develop procedures and systems for reporting and recording the following contents: occupational accidents and diseases, hazardous circumstances and accidents. Such systems should enable the construction workers to immediately report to their own direct superintendent any circumstances causing serious hazards to life and health. When the construction workers are caught in any occupational injuries and risks, suspicious occupational diseases, dangerous situations and accidents, an immediate report should be submitted to the top management; the top management should investigate into all reported occupational accidents, occupational diseases, risks and incidents, during which assistance should be sought from professionals with knowledge and competences of occupational safety.

⑯) Health education should be provided to the construction workers, e.g. execution of information communication strategy, strengthening face-to-face consultation, addressing systematic problems affecting individual behavior, encouraging use of personal protection devices, avoiding spread of disease to others, etc. In addition, the construction workers should be encouraged to use mosquito repellent, clothing and mosquito nets and other blocking methods to avoid spread of diseases from mosquito bites.

⑰) Health examinations should be organized for construction workers to prevent the spread of infectious and epidemic diseases.

5.1.3 Environmental Impact Analysis of Specific Sites

In addition to the aforesaid general impacts on the surrounding environment generated in the construction period of the proposed project, there are still some differences in the environmental impacts on the construction sites of each project school due to the different geographical locations of the construction sites, the different distances from the construction sites to the adjacent sensitive buildings as well as the different functions of these buildings.

Such differences are mainly reflected in the impacts of the construction activities on the surrounding environment and constructional safety. The environmental impacts mainly include construction dust and construction noise. Analysis of the level of impacts shows that noise in the construction period is the key pollution source affecting teaching and domestic activities in the project schools. Since a large variety of mechanical equipment is involved in the construction stage, pneumatic picks, the equipment with the biggest source intensity, are selected in this EIA for prediction and detailed analysis, from the most adverse perspective, of possible impacts that construction noise generates on the surrounding environment; construction safety is mainly reflected in construction site layout, construction management, personnel management and transportation and analysis of possible impacts in this regard needs

to be conducted in association with the layout plan of the project schools.

(1) Gansu Vocational College of Energy and Chemical

Gansu Vocational College of Energy and Chemical is currently under construction and will be put into operation in September 2017. By that time, GVCEC will have around 3000 students and 300 teachers in school. The civil works to be constructed under this WB Loan Project will generate certain impacts on the study and daily life and traffic safety of students in school.

According to the design data, Practical Training Building No. 3, located only 30m away from the civil works to be constructed in GVCEC under the WB Loan Project, will be subject to significant impacts, followed by Dormitory Building No. 4, Building No. 19, Logistics Building No. 11 and Dormitory Building No. 5 with a distance ranging from 30m to 100m. Due to the late construction of Dormitory Building No. 33, Dormitory Buildings No. 5, 31 and 32, which are 35 meters away from Dormitory Building No. 33, will be greatly affected by the civil engineering of Dormitory Building No. 33. See Table 5-8 for details of impact analysis.

Table 5-8 Analysis of Specific Impacts in the Construction Period of GVCEC

SN	Sensitive Protection Objects	Source of Impacts	Environmental Impact Analysis	Construction Safety Impact Analysis
1	Logistics Building No. 11	Construction of Student Dormitory No. 30	<ul style="list-style-type: none"> ◆ Construction noise: 62.5dB(A), exceeding the standard by 2.5dB(A) in day time; ◆ The construction site is located approximately 75m away from the Logistics Building, which is mainly occupied by logistics workers and subject to significant impacts from noises in the construction period mainly in the foundation construction period. The side facing the construction site is subject to greater impact and involves approximately 30 affected persons. 	<ul style="list-style-type: none"> ◆ Construction sites No. 30, No. 31 and No. 32 are located at the northeastern corner of the campus, a living quarter in the school. If not properly managed, construction vehicles and uncontrolled stockpiling of construction materials will bring safety hazards to students on campus. ◆ In addition, this area is relatively densely populated, in particular in the morning, noon and evening peak hours when students are on the way going to or coming back from classes. Therefore, the three construction sites must be reasonably planned and special personnel must be assigned to guide and manage pedestrians on the road.
2	Dormitory Building No. 4	Construction of Student Dormitory No. 31 and 32	<ul style="list-style-type: none"> ◆ Construction noise: 66.02dB(A), exceeding the standard by 6.02dB(A) in daytime. ◆ The student dormitory buildings are densely populated and have a shortest distance of approximately 50m from the construction site, thus subject to significant impacts from construction noise, in particular during noon and night resting hours. Therefore, the construction time must be reasonably scheduled to avoid significant impacts on the students in rest periods. 	
3	Dormitory Building No. 5			

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

4	Practical Training Building No. 3		<ul style="list-style-type: none"> ◆ Construction noise: 70.46dB(A), exceeding the standard by 10.46dB(A) in daytime. 	<ul style="list-style-type: none"> ◆ Building No. 4 is located in the southeastern corner of the school, as a part of the teaching zone. The construction site should be selected in concert with Building No. 24 and the construction areas should be isolated to prevent safety hazards brought by traffic on students and teachers on their way to and back from classrooms.
5	Building No. 19	Construction of Practical Training Building No. 4	<ul style="list-style-type: none"> ◆ The construction sites are very close to the two buildings, with the shortest distance being only 30m. Construction noise produces significant impacts on the teaching activities, involving approximately 100 affected persons. 	
6	Dormitory Building No. 5 Dormitory Building No. 31 Dormitory Building No. 32	Construction of Dormitory Building No. 33	<ul style="list-style-type: none"> ◆ Construction noise: 69.1 dB (A), exceeding the standard by 9.1 dB (A) in the daytime. The construction is prohibited at night. ◆ The distance between the construction site and each of the three dormitory buildings is equivalent, about 35m. The building is mainly for students' accommodation. Noises during the construction have a great influence and are mainly from foundation construction. The side of Building No. 32 facing the construction site is greatly affected, while Building No. 5 and Building No. 31 not directly facing the construction site are slightly impacted. 	<ul style="list-style-type: none"> ◆ The construction site of Dormitory Building No. 33 is located in the northeastern corner of the campus, a living quarter of the school. If not properly managed, construction vehicles and uncontrolled stockpiling of construction materials will bring safety hazards to students on campus. ◆ In addition, this area is relatively densely populated, in particular in the morning, noon and evening peak hours when students are on the way to or coming back from classes. Therefore, the three construction sites must be reasonably planned and special personnel must be assigned to guide and manage pedestrians on the road. The construction area should be isolated to avoid any potential safety hazards to teachers and students brought by vehicles.
<p>Note: The sound environment standard for school campus is 60dB in day and 55dB at night.</p>				

(2) Gansu Finance and Trade Vocational College

Gansu Finance and Trade Vocational College is currently under construction and will be put into operation in September 2017. By that time, GFTVC will have around 6000 students and 487 teachers in school. The civil works to be constructed under this WB Loan Project will generate certain impacts on the study and daily life and traffic safety of students in school.

According to the design data, Student Dormitory Building No. 2 and Comprehensive Teaching Building No. 14 will be impacted by the civil works to be constructed in GFTVC under the WB Loan Project. Based on the characteristics of the noise and dust impacts in the construction period, the impacts on the aforesaid 2 buildings can be effectively reduced through

reasonable planning of construction time and improved construction management. However, with the functions of the two buildings taken into account, in particular Teaching Building No. 14 which undertakes the majority of GFTVC's teaching function and involves relatively dense pedestrian flow during class hours, the attention should focus on the layout of construction sites and construction vehicle traffic and construction management to prevent traffic safety hazards to the students. Since the Practical Training Building No. 20 and Area C of Dormitory Building No. 22 will be built late, the civil engineering of Area C of Dormitory Building No. 22 causes impact on Dormitory Building No. 2 and Area AB of Dormitory Building No. 22, of which Dormitory Building No. 2 and Dormitory Building No. 22 are about 45m and 20m respectively away from the construction site. The dormitory located on the north side of Area B and facing the construction site will be greatly affected. The Second Teaching Building No. 21 and Practical Training Building No.19 are affected by the civil engineering in Area AB of Practical Training Building No. 20. The Second Teaching Building No. 21 is about 55m away from the construction site, while the Practical Training Building No. 19 is about 32m away from the site. See Table 5-9 for details of impact analysis.

Table5-9 Analysis of Specific Impacts in the Construction Period of GFTVC

SN	Sensitive Protection Objects	Source of Impacts	Environmental Impact Analysis	Construction Safety Impact Analysis
1	Student Dormitory Building No. 2	Area AB of Dormitory Building No. 22	<ul style="list-style-type: none"> ◆ Construction noise: 63.74dB(A), exceeding the standard by 3.74dB(A) in daytime. ◆ The student dormitory buildings are densely populated and have a shortest distance of approximately 65m from the construction site, thus subject to significant impacts from construction noise, in particular during noon and night resting hours. Therefore, the construction time must be reasonably scheduled to avoid significant impacts on the students in rest periods. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying. 	<ul style="list-style-type: none"> ◆The construction sites are located close to the living quarters. If not properly managed, construction vehicles and uncontrolled stockpiling of construction materials will bring safety hazards to students on campus. In addition, this area is relatively densely populated, in particular in the morning, noon and evening peak hours when students are on the way going to or coming back from classes. Therefore, the three construction sites must be reasonably planned and special personnel must be assigned to guide and manage pedestrians on the road.
2	Comprehensive Teaching Building No. 14	Area AB of Dormitory Building No. 22	<ul style="list-style-type: none"> ◆ Construction noise: 62.50dB(A), exceeding the standard by 2.5dB(A) in daytime. ◆ The construction site is relatively close to the teaching buildings, with a distance of approximately 75m and, thus produces significant impacts on teaching activities involving approximately 600 affected persons, mainly on the eastern part of the teaching building. Impacts by dust generated in the construction period on local pedestrians may be effectively mitigated through dust screens and timely water spraying. 	<ul style="list-style-type: none"> ◆ The four construction sites are mainly located in teaching areas and should be reasonably planned and located in concert with the position of Teaching Building No. 14. The construction areas should be isolated to prevent safety hazards brought by traffic on students and teachers on their way to and back from classrooms.
	Second Teaching Building No. 21	<ul style="list-style-type: none"> ◆ Construction noise: 57.72dB(A), compliant in day time. ◆ The construction site is located relatively far from the teaching buildings with a distance of approximately 130m. Construction activities in day time produce little impact on the teaching activities while the construction noise at night 		
	Practical Training Building No. 19			
	Practical Training Building No. 18			

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

			produces no impact on the teaching building since it is not occupied at night.	
3	Dormitory Building No. 2	Area C of Dormitory Building No. 22	<p>◆Construction noise: 66.9 dB (A), exceeding the standard 6.9 dB (A) in daytime, and construction is prohibited at night.</p> <p>◆It is about 45m away from the construction site, and the building is mainly for students' accommodation. Noises caused during the construction have a great influence and are mainly from the foundation construction. The side facing the construction site is subject to greater impact.</p>	<p>◆The construction sites of Area C of Dormitory Building No. 22 and Area AB of Practical Training Building No. 20 are both located in the living and teaching area. If not properly managed, construction vehicles and uncontrolled stockpiling of construction materials will bring safety hazards to students on campus.</p> <p>This area is relatively densely populated, in particular in the morning, noon and evening peak hours when students are on the way to school or coming back from classes. Therefore, the three construction sites must be reasonably planned and special personnel must be assigned to guide and manage pedestrians on the road. The construction area should be isolated to avoid any potential safety hazards to teachers and students brought by vehicles.</p>
4	Area AB of Dormitory Building No. 22		<p>◆Construction noise: 74.0 dB (A), exceeding the standard by 14.0 dB (A) in daytime, and construction is prohibited at night.</p> <p>◆It is about 20m away from the construction site, and the building is mainly for students' accommodation. Noises caused during the construction have a great influence and are mainly from the foundation construction. The side facing the construction site is subject to greater impact.</p>	
5	Second Teaching Building No. 21	Area AB of Practical Training Building No. 20	<p>◆Construction noise: 65.2 dB (A), exceeding the standard by 5.2 dB (A) in daytime, and construction is prohibited at night.</p> <p>◆It is about 55m away from the construction site, and the building is mainly for students' accommodation. Noises caused during the construction have a great influence and are mainly from the foundation construction. The side facing the construction site is subject to greater impact.</p>	
6	Practical Training Building No. 19		<p>◆Construction noise: 62.50dB(A), exceeding the standard by 9.9dB(A) in day time, and construction is prohibited at night.</p> <p>◆The building is about 32m away from the construction site, and is mainly for teaching and practical</p>	

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

			training. Since Building No. 19 is not directly facing the construction site, the noise mainly concentrated in the foundation construction stage will have a slight impact on teaching activities.	
Note: The sound environment standard for school campus is 60dB in day and 55dB at night.				

(3) Gansu Senior Technical School of Mechanics

The construction site is located in the middle of the campus surrounded by teaching buildings, office buildings, practical training buildings, student dormitories and a track field. The key pedestrian passages in campus are located around the construction site and these roads are very densely occupied by pedestrians in particular during the peak hours before and after class and the breakfast, lunch and supper hours. Safety of pedestrians on campus becomes an issue deserving focused attention in the construction period. See Table 5-10 for details of impact analysis.

Table 5-10 Analysis of Specific Impacts in the Construction Period of GSTSM

SN	Sensitive Protection Objects	Source of Impacts	Environmental Impact Analysis	Construction Safety Impact Analysis
1	In-campus library	Teaching building and teaching office building to be constructed	<ul style="list-style-type: none"> ◆ Construction noise: 76.48dB(A), exceeding the standard by 16.48dB(A) in day time. ◆ The library is located very close to the construction site with a distance of only 15m and construction noise produces significant impacts on students studying in the library. 	<ul style="list-style-type: none"> ◆ Since the construction site is located in the middle of the campus, surrounded by walkways used in daily activities of teachers and students, the normal teaching activities and student daily life will be seriously disturbed if no effective measures of construction organization and management are implemented. ◆ Analysis of the layout of the in-campus roads shows that the East Gate is the only access for vehicles, including transportation vehicles in the construction period. However, roads connecting this gate are relatively narrow and have high concentration of pedestrians and
2	In-campus Office Building		<ul style="list-style-type: none"> ◆ Construction noise: 62.50dB(A), exceeding the standard by 12.5dB(A) in day time. ◆ The office building is located at a distance of 75m from the construction site and subject to relatively insignificant noise impact. 	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

3	In-campus Student Dormitory Building	<ul style="list-style-type: none"> ◆ Construction noise: 72.04dB(A), exceeding the standard by 12.04dB(A) in day time. ◆ Located east of the construction site with a relatively short distance of approximately 25m, the dormitories are subject to significant noise impacts mainly during the noon and night resting hours. Therefore, the construction time must be reasonably planned to avoid significant impacts on students in rest periods. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying. 	<p>traffic in particular in the morning, noon and evening rush hours. Without a reasonable route planning for construction vehicles, traffic jam will occur and traffic safety hazards will arise to a certain extent.</p>
4	In-campus Practical Training Rooms	<ul style="list-style-type: none"> ◆ Construction noise: 76.48dB(A), exceeding the standard by 16.48dB(A) in day time. ◆ The construction site is located only 15m away from the practical training rooms and construction noise produces significant impacts on the teaching activities involving approximately 30 affected persons. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying. 	
5	All-weather sport ground	<ul style="list-style-type: none"> ◆ The impacts generated by the construction site on the sport ground are mainly reflected in the impacts of construction dust on the health of those exercising on the sport ground. The impact of construction noise is not significant. 	
<p>Note: The sound environment standard for school campus is 60dB in day and 55dB at night.</p>			

(4) Lanzhou University of Arts and Science

The construction site is located in the northern part of the campus with Yanbei Road on its north, a planned road on its east and the Practical Training Base 10m away to its south and

the school landscaping area and plaza to its west. The Teaching Office Building is located approximately 70m southwest of the construction site. Impacts generated by the construction of the Project on the normal teaching activities of the school are mainly reflected in noise impacts and construction safety. See Table 5-11 for details of impact analysis.

Table 5-11 Analysis of Specific Impacts in the Construction Period of LUAS

SN	Sensitive Protection Objects	Source of Impacts	Environmental Impact Analysis	Construction Safety Impact Analysis
1	In-campus teaching office building	Art Practice Center to be constructed	<ul style="list-style-type: none"> ◆ Construction noise: 63.10dB(A), exceeding the standard by 3.1dB(A) in daytime. ◆ The construction site is located far away from this building, with a distance of approximately 70m. The classrooms adjacent to the construction site are mainly used for exams and have relatively high requirements on sound environment. Therefore, attention must be paid to control of noise in the construction period. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying. 	<ul style="list-style-type: none"> ◆ Analysis of in-campus traffic condition shows that the School has only one gate located approximately 150m west of the construction site. According to the site survey, the School has two campuses, the South Campus and the North Campus, with Yanbei Road running in-between and the gates of the two campuses just across the road. The South Campus, located south of Yanbei Road, mainly provides the functions of daily teaching and practical training while the North Campus, located north of Yanbei Road, mainly provides the function of student lodging and accommodation. Therefore, during the morning, noon and evening peak hours, students will travel between the two campuses across Yanbei Road for meals or classes. The high concentration and density of pedestrian flow in such hours bring traffic pressure on this road section. ◆ The proposed project component is located in the South Campus of LUAS
2	Practical Training Base		<ul style="list-style-type: none"> ◆ Construction noise: 80dB(A), exceeding the standard by 20dB(A) in daytime. ◆ The proposed Practical Training Base is located in the very close neighborhood with a distance of only 10m from the construction site and significant impacts will be generated from construction noise on the teaching activities. Therefore, actions must be taken for noise reduction. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying. 	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

3	Beimiantan New Village	<p>◆Construction noise: 60.92dB(A), exceeding the standard by 0.92dB(A) in daytime.</p> <p>◆Beimiantan New Village is mainly a residential area and the houses subject to impacts of the project construction are roadside shops that are not densely populated. The construction site is located approximately 95m away from this residential area and the impacts of construction noise are thus insignificant.</p>	<p>and it will be necessary to transport large volume of construction materials and debris or construction solid wastes in the construction period. Therefore, reasonable route planning for the construction vehicles is needed in order to avoid possible traffic safety hazards to the students.</p>
<p>Note: The sound environment standard for school campus is 60dB in day and 55dB at night.</p>			

5.1.4 Environmental Mitigation Measures for Specific Sites

(1) Gansu Vocational College of Energy and Chemical

1) Mitigation measures are proposed in this EIA for each of the sensitive points of this project school as shown in detail in Table 5-12.

Table 5-12 Mitigation Measures for the Specific Impacts in the Construction Period of Gansu Vocational College of Energy and Chemical

SN	Construction Site	Environmental Mitigation Measures	Layout Requirements of Construction Site	Traffic Safety Measures
1	Student Canteen No. 30	<ul style="list-style-type: none"> ◆ Noises generated by the construction activities exceed the standard by 2.5 to 6.02dB(A). Sound insulation windows are installed for each building with a noise reduction of approximately 10 to 15 dB(A). Therefore, with windows closed, it can be guaranteed the sound environment standard will be satisfied. ◆ Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day. ◆ Low-noise pneumatic or spiral pile drivers should be used. 	<ul style="list-style-type: none"> ◆ One centralized construction camp should be set up at the northeastern corner of the campus. The construction camp and the three construction sites should be separated from the surrounding dormitory buildings with closeable fences. ◆ Construction workers should not be allowed to enter the student dormitory buildings without due authorization. ◆ Special personnel should be assigned to carry out tour inspections around the construction area to prevent students from entering the construction area without due authorization. ◆ Stronger efforts should be made in inspection around the construction sites, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites. 	<ul style="list-style-type: none"> ◆ Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization. ◆ Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety. ◆ No honking is allowed when construction vehicles travel on campus. ◆ Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road.
2	Dormitory No. 31			
3	Dormitory No. 32			
4	Teaching Building No. 24	<ul style="list-style-type: none"> ◆ The construction site of Practical Training Building No. 4 is located very close to Practical Training Building No. 3 and the noise standard is exceeded by 10.46dB(A). In order to assure effective noise reduction, sound insulation retaining walls (with a noise reduction of 6-10dB(A)) should be 	<ul style="list-style-type: none"> ◆ One centralized construction camp should be set up in the eastern part of the campus to provide service during the construction of both civil works. A fully closed management system should be adopted for the construction sites. ◆ Construction workers should not be allowed to enter the Practical Training Building without due 	
5	Practical Training Building No. 4			

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

		<p>provided around the construction site and sound insulation windows should be installed to avoid impacts from construction noise and assure that the sound environment in the Practical Training Building complies with the standard.</p> <ul style="list-style-type: none"> ◆The sound insulation retaining wall should not be lower than 5m in height and should fully surround the western and northern sides of the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction. ◆High-noise construction activities should be avoided in class hours. ◆Low-noise pneumatic or spiral pile drivers should be used. 	<p>authorization.</p> <ul style="list-style-type: none"> ◆Visitors are not allowed to enter the construction area without due authorization. 	
6	Dormitory Building No. 33	<ul style="list-style-type: none"> ◆The noise caused by construction exceeds the standard by about 9.1 dB (A). Sound insulation windows are installed in all buildings, with a noise reduction effect of about 10-15dB (A). Therefore, with windows closed, it can be guaranteed that the sound environment standard will be met. ◆Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day. ◆Low-noise pneumatic or spiral pile drivers should be used. 	<ul style="list-style-type: none"> ◆A construction camp should be set up in the northeast corner of the campus. The construction camp and the Dormitory Building No. 33 should be separated from the surrounding dormitory buildings with closed fences. ◆Construction personnel should not be allowed to enter or leave the building without authorization. ◆Special personnel should be assigned to carry out tour inspections around the construction area to prevent students from entering the construction area without due authorization. ◆Patrol should be strengthened in the vicinity of the construction site, especially in the morning, middle and evening 	<ul style="list-style-type: none"> ◆A temporary gate will be set up on the side of the construction site near the road in the northeast corner. Vehicles should enter and leave the campus via the temporary gate and travel along designated routes and should not travel on campus without due authorization. ◆Transportation vehicles on the construction site should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety. ◆No honking is allowed when construction vehicles travel on campus.

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

			meals and class hours. Special personnel should be assigned to be responsible for the management of the flow of students in the area. Students are required to stay away from the construction site and not stay around the construction site for a long time.	
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2) Temporary toilets and septic tanks should be provided in construction camps and night soil should be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment.

3) The construction contractors should remove and transport the construction solid wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District.

(2) Gansu Finance and Trade Vocational College

1) Mitigation measures are proposed in this EIA for each of the sensitive points of this project school as shown in detail in Table 5-13.

Table 5-13 Mitigation Measures for the Specific Impacts in the Construction Period of Gansu Finance and Trade Vocational College

SN	Construction Site	Environmental Mitigation Measures	Layout Requirements of Construction Site	Traffic Safety Measures
1	Area AB of Dormitory Building No. 22	<ul style="list-style-type: none"> ◆ Noises generated by the construction activities exceed the standard by 3.74dB(A). With windows closed, impacts from construction noise can be effective reduced to assure compliance with the sound environment standard. ◆ Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day. ◆ Low-noise pneumatic or spiral 	<ul style="list-style-type: none"> ◆ One centralized construction camp should be set up at the southeastern corner of the campus. The construction camp and the construction sites Building No. 21 and 22 should be fenced up and separated from the surrounding buildings with closeable fences. ◆ The construction workers should not be allowed to enter the Student Dormitory Building and Teaching Building without due authorization. ◆ Special personnel should be assigned to carry out tour inspections around the construction area to 	<ul style="list-style-type: none"> ◆ Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization. ◆ Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety. ◆ No honking is allowed when construction vehicles travel on campus. ◆ Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

		pile drivers should be used.	prevent students from entering the construction area without due authorization.	<ul style="list-style-type: none"> ◆ Due to campus environment restrictions, it is necessary to provide a special road on the construction site of Building No. 18 as a construction transportation access road connecting the East Gate. Therefore, a reasonable route planning is needed and it is recommended that fences are installed to separate pedestrian from traffic. ◆ Based on the layout of the school buildings, it is recommended to close roads adjacent to the construction area on the east side of the campus and arrange all students and faculty to use roads on the west side of the campus.
2	Second Teaching Building No. 21	<ul style="list-style-type: none"> ◆ Noises generated by the construction activities exceed the standard by 2.5dB(A). With windows closed, impacts from construction noise can be effective reduced to assure compliance with the sound environment standard 	<ul style="list-style-type: none"> ◆ Stronger efforts should be made in inspection around the construction sites, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites. 	
3	Practical Training Building No. 19	<ul style="list-style-type: none"> ◆ High-noise construction activities should be avoided in class hours. 	<ul style="list-style-type: none"> ◆ The construction sites of Building No. 18 and No. 19 should be fenced up with closeable fences. Due to environment restrictions, it is necessary to set up a centralized construction camp at the southeastern corner of the campus to provide construction services to both construction sites. 	
4	Practical Training Building No. 18	<ul style="list-style-type: none"> ◆ Low-noise pneumatic or spiral pile drivers should be used. 	<ul style="list-style-type: none"> ◆ Stronger efforts should be made in management of construction workers, who should not be allowed to enter the teaching building and the practical training building without due authorization. 	
5	Area C of Dormitory Building No. 22	<ul style="list-style-type: none"> ◆ The noise of Dormitory Building No. 2 exceeds the standard by 6.9 dB (A). The influence of construction noise can be effectively reduced by closing the windows to ensure that the sound environment reaches the standard. ◆ Area AB of Dormitory Building No. 22 is very close to the construction site, and the noise exceeds the standard by 14dB (A). In order to 	<ul style="list-style-type: none"> ◆ One centralized construction camp should be set up at the southeastern corner of the Area AB of Practical Training Building No. 20. The construction camp and the construction site No. 20 should be fenced up and separated from the surrounding buildings with closeable fences. An exit should be opened near the gate on the east side of the campus, with special personnel guarding it and guiding vehicles into the construction site. ◆ Closeable fences should be set around the construction site in Area C of Dormitory Building No. 	<ul style="list-style-type: none"> ◆ When vehicles enter and leave the campus, they should all enter and leave the campus through the east gate and the temporary gate, and strictly along designated routes. Without permission, they are not allowed to travel through the campus at will. ◆ Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety. ◆ No honking is allowed when construction vehicles travel on campus. ◆ Transportation of construction materials and construction debris should

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

		<p>assure effective noise reduction, sound insulation retaining walls (with a noise reduction of 6-10dB(A)) should be provided around the construction site and sound insulation windows should be installed to avoid impacts from construction noise and assure that the sound environment in the Practical Training Building complies with the standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the western and northern sides of the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction.</p> <ul style="list-style-type: none"> ◆Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day. ◆Low-noise pneumatic or spiral pile drivers should be used. 	<p>22, and a temporary gate should be opened on the side adjacent to the road. All construction workers and vehicles should enter and leave the site through the temporary gate and should not be allowed to enter the campus without due authorization.</p> <ul style="list-style-type: none"> ◆Construction workers should not be allowed to enter or leave the school buildings without due authorization. ◆Special personnel should be assigned to carry out four inspections around the construction area to prevent students from entering the construction area without due authorization. ◆Patrol should be strengthened in the vicinity of the construction site, especially in the morning, middle and evening meals and class hours. Special personnel should be assigned to be responsible for the management of the flow of students in the area. Students are required to stay away from the construction site and not stay around the construction site for a long time. 	<p>occur during class hours with minimal pedestrians on the road.</p>
6	Area AB of Practical Training Building No. 20	<ul style="list-style-type: none"> ◆Noises generated by the construction activities exceed the standard by 5.2 to 9.9dB(A). Sound insulation windows are installed for each building with a noise reduction of approximately 10 to 15 dB(A). Therefore, with windows closed, it can be guaranteed 		

		<p>the sound environment standard will be satisfied.</p> <ul style="list-style-type: none"> ◆Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day. ◆Low-noise pneumatic or spiral pile drivers should be used. 		
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2) Temporary toilets and septic tanks should be provided in construction camps and night soil should be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment.

3) The construction contractors should remove and transport the construction solid wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District.

(3) Gansu Senior Technical School of Mechanics

1) Mitigation measures are proposed in this EIA for each of the sensitive points of this project school as shown in detail in Table 5-14.

Table 5-14 Mitigation Measures for the Specific Impacts in the Construction Period of Gansu Senior Technical School of Mechanics

SN	Construction Site	Environmental Mitigation Measures	Layout Requirements of Construction Site	Traffic Safety Measures
1	Teaching Building and Teaching Office Building	<ul style="list-style-type: none"> ◆Noises generated by the construction activities exceed the standard by 16.48dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows are installed to effectively avoid impacts of construction noises and assure compliance with the sound environment standard. ◆The sound insulation 	<ul style="list-style-type: none"> ◆A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the southern side of the construction site far away from the teaching building, dormitory building and practical training rooms. ◆ Protective fences should be provided 	<ul style="list-style-type: none"> ◆Special personnel should be assigned to guide construction vehicles entering the construction site via the East Gate and make sure the vehicles strictly follow the designated routes on site. ◆ Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety. ◆No honking is allowed when construction vehicles travel on campus. ◆A reasonable time

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

		<p>retaining wall should not be lower than 5m in height and should fully surround the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction for high-rise buildings.</p> <ul style="list-style-type: none"> ◆ Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day. ◆ High-noise construction activities should be avoided in class hours. ◆ No honking is allowed when construction vehicles travel on campus. ◆ In order to avoid health impacts by construction dust on those exercising on the sport ground, it is recommended that the school should adjust the teaching schedule to avoid teaching activities on the sport ground in the ground excavation stage with high incidence of dusting; double-layer dust screens should be used and water should be sprayed in the other construction periods to minimize dust generation. ◆ Low-noise pneumatic or spiral pile drivers should be used. 	<p>along roads around the construction sites to prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order.</p> <ul style="list-style-type: none"> ◆ The tower cranes should be located with the surrounding buildings and pedestrian safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians. 	<p>schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided.</p> <ul style="list-style-type: none"> ◆ Large transportation vehicles should not be allowed to enter the campus before 20:00.
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2) Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage should be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Tianshui Municipal WWTP for compliance treatment.

3) Construction solid wastes must be collected at designated locations and subject to centralized disposal by Tianshui Environmental sanitation Bureau at designated solid wastes

landfill sites.

(4) Lanzhou University of Arts and Science

1) Mitigation measures are proposed in this EIA for each of the sensitive points of this project school as shown in detail in Table 5-15.

Table 5-15 Mitigation Measures for the Specific Impacts in the Construction Period of Lanzhou University of Arts and Science

SN	Construction Site	Environmental Mitigation Measures	Layout Requirements of Construction Site	Traffic Safety Measures
1	Art Practice Center	<ul style="list-style-type: none"> ◆ Noises generated by the construction activities exceed the standard by 20dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows (with a noise reduction of 10-15dB(A)) are installed to effectively avoid impacts of construction noises and assure compliance with the sound environment standard. ◆ The sound insulation retaining wall should not be lower than 5m in height and should fully surround the building to be constructed and be able to move with the floors under construction. ◆ High-noise construction activities should be avoided in class hours. ◆ No honking is allowed when construction vehicles travel on campus. ◆ Foundation excavation should be carried out manually. 	<ul style="list-style-type: none"> ◆ It is recommended that a temporary exit be opened on the side of the construction site on Yanbei Road and the construction site is connected with the school fencing wall to form an independent and closed construction area. All construction plants, vehicles and personnel will enter and leave the construction site via the temporary exit to realize full separation of construction activities from teaching activities, effectively avoid mutual impacts between construction workers, construction vehicles and pedestrians and vehicles in campus and minimize impacts on normal teaching activities on campus and the dense pedestrian flows appearing in the morning, noon and evening peak hours at the existing gate. ◆ A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the northeastern side of the construction site far away from the teaching building and practical training rooms. ◆ Protective fences should be provided along roads south of the construction site at the entrance and exit of the Practical Training Building 	<ul style="list-style-type: none"> ◆ Special personnel should be assigned to guide construction vehicles entering the construction site and strictly travel along designated routes on site. ◆ No honking is allowed when construction vehicles travel on campus. ◆ A reasonable time schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided. ◆ Large transportation vehicles should not be allowed to enter the campus before 20:00. ◆ Active efforts should be made to coordinate and negotiate with the traffic police about the need of traffic safety management at the front gate and early installation of video camera surveillance equipment.

			<p>to prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order.</p> <p>◆ The tower cranes should be located with the surrounding buildings and pedestrian safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians.</p>	
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2) The construction contractors should have all their staff on site registered and filed at the School Security Department and rent residential houses in the neighborhood as the accommodation of construction workers.

3) Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage should be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Lanzhou Municipal WWTP for compliance treatment.

4) Construction solid wastes should be declared and reported to Lanzhou Urban Management and Administrative Law Enforcement Bureau and a Letter of City Image and Environmental Sanitation Responsibility should be signed. Lanzhou Urban Management and Administrative Law Enforcement Bureau should be responsible for supervising and managing the disposal of all construction solid wastes of the proposed project.

(5) Mitigation Measures for Sensitive Protection Objects

Environmental mitigation measures for the sensitive zones in the neighborhood are mainly related to the construction period and include measures for mitigating air environment and sound environment impacts. Details of the impact factors and measures are described as follows:

1) Air environment impact factors

The key factor impacting the air environment at the sensitive points in the construction period of the proposed project is construction dust.

Dusts generated in the construction period include dust raised by vehicles, dust raised by wind from open-air stockpiles and exposed sites and dust raised by wind from lime soil mixing sites. Construction dust will pollute the air environment around the construction site and affect the health of target population for sensitive protection.

2) Air environment impact mitigation measures

① Transportation dust control: Transportation management should be strengthened and actions should be taken to assure the transportation vehicles travel at specified speed; transportation routes should be selected in a scientific way and transportation roads should be sprayed with water on a periodical basis; powdery materials should be packed in tanks or bags while fly ash should be packaged and transported in the wet method; Overloading is prohibited during transportation of soil, cement and lime, which should be covered with tarpaulin, with any spills en route immediately cleaned and removed.

② Mitigation measures for dust generated from lime soil mixing and cement concrete mixing: Reasonable arrangements should be made for the mixing plants to achieve centralized mixing; lime soil mixing plants should not be located upwind of environmentally sensitive points; mixing plant operators should be provided with health protection services and masks and protective goggles; cement concrete should be outsourced from commercial concrete suppliers, if possible, and no cement mixing plant should be constructed.

③ Mitigation measures for dust generated from material stockpiles: Material stockpiles should be located downwind of the sensitive areas and covered with tarpaulins; materials in storage should be reduced in volume and utilized in time. Fences should be provided when necessary and water should be sprayed on a periodical basis for dust prevention.

3) Sound environment impact factors and their mitigation measures

1) Transportation noise

Mainly referring to noise generated in the process of vehicle travelling.

2) Construction plant noise

Different mechanical plants are used on the construction sites in different construction stages of the project. The key noise sources in the earthwork construction stage, for example, are bulldozers, excavators, loaders and transportation vehicles while those in the foundation construction stage are compactors, cranes and graders. Cutters are the main noise-generating equipment in the structure construction stage. The noise impact scope of the aforesaid construction plants is normally within 100m.

3) Traffic noise control

① Construction sites of the proposed project should be reasonably selected so that the sensitive zones in the adjacency are avoided and noise pollution problems are avoided at the time of planning.

② Measures such as erecting “No Honking” and speed limit signs may be taken along

sensitive road sections with schools, hospitals, and residential areas and nursing homes on both sides and in campus.

③ Workers in high-noise working environment should take self-protection measures.

4) Construction Plant Noise Control

① High-noise plants in the living area of construction workers and in the construction sites should be located as far away from sensitive points as possible and, in the meanwhile, measures such as silencing, insulation and damping should be taken against strong noise sources.

② Construction technologies with low noise vibration should be selected.

③ Temporary sound insulation fences should be installed on the boundary of the construction site; high-noise operations should be scheduled in such a way that the class hours and noon time resting hours are avoided; high-noise operations including pile driving should be suspended in night time. Where continuous operation is necessary, a request should be submitted to the local environmental protection authority for approval and a notice should be issued to teachers and students on campus as well as residents in the neighborhood; some specific high-noise operations may be implemented during the fixed festivals and holidays or winter and summer school holidays.

5.2 Environmental Impact Analysis and Mitigation Measures in the Operation Period

5.2.1 Analysis of General Environmental Impacts

(1) Analysis of air environment impacts

The civil works of the four project schools under the Project will be mainly used for teaching, practical training and student daily activities, basically involving no impacts on the air environment.

(2) Analysis of water environment impacts

Sewage in schools mainly comes from daily activities of students served by the proposed project. Wastewater generated in general is domestic sewage that is pretreated in the septic tanks in the schools and discharged into the municipal sewage pipelines after satisfying Class III standard limits specified in Comprehensive Discharge Standard for Wastewater (GB8978-1996). The sewage is finally delivered to the municipal WWTP of the city where the respective school is located and treated to the required standard before discharge, thus producing very minor environmental impacts.

(3) Solid Wastes

After the Project is put into service, solid wastes to be generated in the ordinary teaching activities and daily life activities will be domestic solid wastes. Garbage collection sites will be set up by each school and the collected solid wastes will be subject to disposal according to the uniform requirements of the environmental sanitation authority of the cities that the project schools belong to. Therefore, environmental impacts will be very insignificant.

(4) Sound environment impact analysis

Noises in the operation period of the proposed project mainly comprise of noise from equipment operation in the Practical Training Building and noise generated in the teaching and daily life activities. The practical training equipment is mainly used for presentation and the noise-generating equipment are located inside the building with a noise value ranging from 60 to 80 dB(A), producing substantially no impact on the surrounding environment.

5.2.2 General pollution control measures

(1) Water pollution control measures

Wastewater in the operation period is mainly domestic sewage with simple quality and stable quantity and will produce very insignificant environmental impact after treated with the following measures.

1) Domestic sewage of the project schools should be pretreated in septic tanks to meet Class III standard limits specified in the Comprehensive Discharge Standard for Wastewater (GB8978-1996) before discharged into the local municipal sewage pipelines.

2) Each of the project schools should implement separate stormwater and sewage drainage system, with stormwater collected and discharged into the municipal stormwater pipeline and domestic sewage treated in septic tanks and diverted via the municipal sewer pipelines into the adjacent WWTP to be treated according to the respective standard before final discharge.

3) The sewage pipelines, in particular the pipe connections and elbows, should be inspected on a periodical basis to prevent environmental pollution caused by leakage of domestic sewage.

4) Septic tanks should be periodically dredged and maintained, with the dried sludge delivered to the municipal domestic solid wastes landfills for hygienic landfill.

5) Each of the project schools should develop a special emergency response plan and assign a special responsible person so that any sewer blockage, leakage or abnormalities are resolved immediately to prevent contamination to the surrounding environment.

(2) Solid wastes

Solid wastes involved in the Project are mainly domestic solid wastes and septic tank sludge and the domestic solid wastes mainly include paper scraps, peels and plastics. Based on the characteristics of such solid wastes, the following solid waste management measures are proposed:

1) Classified garbage collection bins should be provided in the project area to achieve classified recovery of domestic solid wastes such as paper scrap, metals, glass, and corresponding management measures should be developed:

① A sound management system should be developed to define responsibilities and achieve periodical cleaning and collection of garbage;

② Degradable garbage bags should be used as a general requirement for garbage collection;

③ Reasonably garbage collection and transportation routes should be planned and protective measures taken to minimize spillage during transportation.

2) Solid wastes should be removed in time and subject to proper disposal.

Upon completion, the domestic solid wastes to be generated by teachers and students and other workers in the project schools will be ordinary solid wastes. Such solid wastes should be regularly collected by in-campus cleaners and stockpiled at existing domestic solid waste stockpiling sites in schools and then transported out of the campus by the local environmental sanitation authority on a periodical and timely basis for centralized hygienic landfill or incineration. The temporary solid waste stockpiling sites should be subject to periodically sterilization and pest control.

3) Stronger management actions should be taken to prohibit littering.

Garbage collection facilities should be reasonably arranged in the project area for the sake of convenient garbage discharge. In addition, stronger management actions should be taken by providing obvious signs or directives to avoid littering.

4) The sludge dredging frequency of septic tanks should be determined based on the technical standards of the septic tanks, which are usually dredged every 90 days, 180 days or 360 days. The dredged sludge may be used as organic fertilizers or delivered for harmless disposal.

(3) Sound environment

1) Rubber shock pads should be placed beneath the practical training equipment to reduce impacts from equipment vibration and noise.

2) Landscaping should be used as a measure for controlling noises. Areas around the buildings should be landscaped to not only absorb sound and reduce noise, but also stop dust and beautify environment.

3) Double-glazed windows should be used. Double-glazed windows (with a thickness of 150mm) may reduce indoor noise by 10 to 25 dB(A).

The aforesaid measures can effectively reduce the impacts on school buildings generated by ambient noises as well as the impacts on the surrounding environment generated by practical training equipment in the classrooms to satisfy the sound environment quality standard.

5.2.3 Impact Analysis of Specific Sites

(1) Gansu Vocational College of Energy and Chemical

1) Waste oil rags

GVCEC has set up a vehicle testing and maintenance training room to meet the needs of specialty teaching. The vehicle testing and maintenance simulations included as a part of the training process produce a small amount of waste oil rags of about 0.2tons per year. According to the requirements of the National Hazardous Waste Catalog (2016), waste oil rags are full-process exempted hazardous wastes and not managed as hazardous wastes in the full process and should be mixed with domestic solid wastes for disposal.

2) Cooking fume

Cooking fume in this Project mainly comes from the canteen. Assuming that the canteen provides service to 2320 students and each student consumes approximately 30g edible oil at an oil volatilization rate of 2.83%, the cooking fume generation capacity will be 1.97kg/d (591kg/a).

As shown in the design data, the concerned canteen with 28 double-stove ovens is categorized as a large catering enterprise in the Emission Standards of Cooking Fume (Trial) (GB18483-2001) and fume purification facilities must be installed and operated according to the requirements. No uncontrolled emission should occur and the removal rate of fume purification facilities should not be less than 85%.

Therefore, it is required in this EIA that gas collecting hood, special flue and fume purifiers are provided in the canteen operation rooms to assure that the cooking fume collected by the gas collecting hood enters via the special flue into the fume purifier for purification treatment according to the discharge standard. The flue ventilator should be positioned on the roof to achieve high-altitude emission. The canteen flue ventilators should be located on the side far

away from the student dormitories and rooftop high-altitude emission can assure rapid diffusion of fume, thus no significant impacts will be generated on ambient air environment quality.

3) Canteen stove combustion gas

Calculated at a per capita gas consumption of 0.2m³/d, the canteen will come up with a total gas consumption of 464m³/d (139,200m³/a). Exhaust gas in a total volume of 12m³ will be generated from the combustion of 1m³ natural gas and the yearly combustion gas will amount to 1,670,400m³/a. Based on the amount of pollutants generated from natural gas combustion (as shown in detail in Table 5-16), the proposed canteen will generate 0.088 t of NO₂, 0.014t of SO₂ and 0.033t of flume from natural gas combustion of its stoves.

Table 5-16 Pollutant generated from natural gas combustion of stoves

Pollutant	NO ₂	SO ₂	Fume
Pollutant generation coefficient (kg/10000 m ³ natural gas)	6.3	1.0	2.4
Natural gas consumption (10000 m ³ /a)	13.92		
Emission (t/a)	0.088	0.014	0.033

Natural gas is a clean energy. Pollutant emitted from natural gas consumed in the project canteen will be collected by the gas collecting hood and delivered via the special flue to rooftop for high-altitude emission to assure rapid diffusion and no significant impacts will be caused on the ambient air environment quality.

4) Canteen cooking wastewater

According to the design data, upon completion, the canteen will involve a maximum wastewater discharge capacity of 337.5m³/d (101.25t/a). Such wastewater mainly comprises of cooking wastewater. See Table 5-17 for details of cooking wastewater generation and discharge.

Table 5-17 Statistics of Generation Volume of Wastewater and Key Pollutants

SN	Pollution factor	Before pretreatment		After pretreatment	
		Generation concentration(mg/L)	Generation capacity(t/a)	Discharge concentration (mg/L)	Discharge capacity (t/a)
1	CODcr	400	40.50	340	34.43
2	BOD5	200	20.25	180	18.23
3	SS	220	22.28	154	15.59
4	Ammonia nitrogen	25	2.53	24	2.43

5	Animal and vegetable oils	30	3.04	9	0.91
Note		The removal efficiency of the oil separating tanks is 70%. The removal rate of the septic tank is 15% for COD _{Cr} , 10% for BOD ₅ , 30% for SS and 4% for ammonia nitrogen.			

According to the design data, outdoor oil separating tanks will be constructed as a part of the canteen and the cooking wastewater generated from the canteen will be treated in the outdoor oil separating tank and then delivered to the septic tank for digestion treatment before further discharged into the municipal sewers to effectively avoid the impact on water environment by such wastewater.

5) Canteen kitchen wastes

Calculated at a capacity of 0.5kg per person per day, 1160kg kitchen wastes will be generated per day and 348 t per year by the canteen.

This EIA requires the canteen to provide special collection bins for kitchen wastes. Such collection bins should be leak proof and properly sealed to prevent odor and leakage during transportation. Special personnel should be assigned in the canteen to collect garbage and make sure the collected garbage is handled according to the disposal requirements of LND EPB.

6) Natural gas

Using natural gas as the fuel, the canteen involves risks of intoxication, fire and explosions caused by natural gas leaks due to pipeline ruptures in the operation period. Regarding such risks, the EIA has proposed strict risk prevention measures as shown in detail in the section of “Natural Gas Risk Prevention Measures”.

5.2.4 Mitigation Measures for Specific Sites

(1) Gansu Vocational College of Energy and Chemical

1) Garbage collection bins should be provided in the practical training rooms and the waste oil rags generated in the teaching process are collected and mixed with domestic solid wastes for disposal according to uniform requirements.

2) Gas collecting hood, special flue and fume purifiers should be provided in the canteen operation rooms to assure that the cooking fume collected by the gas collecting hood enters via the special flue into the fume purifier for purification treatment to the Emission Standards of Cooking Fume (Trial) (GB18483-2001) before final emission. The flue ventilator should be positioned on the roof to achieve high-altitude emission.

3) The canteen flue ventilators should be located on the side far away from the student dormitories.

4) Outdoor oil separating tanks should be constructed as a part of the canteen to assure that the cooking wastewater generated from the canteen is treated in the outdoor oil separating tank and then delivered to the septic tank for digestion treatment before finally discharged into the municipal sewers.

5) The canteen should provide special collection bins for kitchen wastes. Such collection bins should be leak proof and properly sealed to prevent emission of odor and leakage during transportation. Special personnel should be assigned in the canteen to collect garbage and make sure the collected garbage is handled according to the disposal requirements of LND EPB.

6) The “Natural Gas Risk Prevention Measures” should be strictly enforced.

(2) Natural gas risk prevention measures

Gansu Vocational College of Energy and Chemical under the World Bank Loan Gansu TVET Project involves connection to the natural gas network and risks of intoxication, fire and explosion from natural gas leaks due to natural gas pipe ruptures. To address such risks, the EIA requires the implementation of the following measures:

1) Underground pipelines should be identified using warning boards erected on the ground while aboveground pipelines should be painted in one uniform warning color to promote public awareness of protection.

2) Problems discovered during periodical inspection, maintenance and normal operation of pipelines and valves should be rectified in a timely manner to avoid accidents arising from equipment failures;

3) Operators should strictly abide by the codes of operation to avoid accidents caused by operation errors;

4) Operational management should be strengthened through periodical training to improve the operating skills of pipeline workers;

5) Fire protection and extinguishing devices should be inspected regularly and assured in normal operation.

6) In case of a fuel gas leak, valves should be shut off and windows should be opened for immediate ventilation while open flames, telecommunication tools of whatever kinds and on/off operation of lights or electrical appliances and metal frictions should be avoided.

7) In case of a fire accident due to fuel gas leakage, wet rags should be placed over the fire point and valves shut off after the fire is completely extinguished. Never attempt to shut off the valves before the fire is extinguished because backflow may occur and lead to explosion

when shutting off a valve immediately upon a fire.

8) Immediately evacuate personnel in the building and call 119 in case of a serious fire.

9) Intelligent fire alarm controllers should be selected for the fire alarm system.

10) The project schools should develop a detailed emergency response plan to make sure that emergency response actions are implemented under uniform command, responsible persons and departments are assigned and their duties and responsibilities defined and emergency accidents are put under control in the shortest possible time to reduce environmental and personal harms caused by natural gas leakage risks. Such emergency response plans should mainly include the following contents:

① Alarm call, contact information;

② Tiered response procedure;

③ Emergency environmental monitoring, emergency rescue, first aid and control measures;

④ Personnel emergency evacuation, evacuation organization plan;

⑤ Restoration measures;

⑥ Emergency response training plan.

5.3 Due Diligence

5.3.1 Wastewater Treatment and Water Recycling Center of LND TVET Park Zone A

2 wastewater treatment and water recycling centers will be constructed in Zone A of LND TVET Park.

Name of project: LND TVET Park Zone A Wastewater Treatment and Water Recycling Center (East) and LND TVET Park Zone A Wastewater Treatment and Water Recycling Center (West).

Scope of construction: The East Center and the West Center will respectively achieve a treatment capacity of 20,000 ton/day and 5,000 ton/day.

Construction Site: The East Center will be located west of Chuangzhinan Road and south of Weishiliu Road in LND and will adopt AAO treatment technology; The West Center will be located between Weiershiliu Road and Chuangzhixi Road in LND and will adopt MSBR treatment technology;

Construction period: The centers will be commenced in 2016 and completed in July 2017, able to meet the needs of wastewater treatment of the Project.

Effluent water quality standards: Effluent is designed to meet the standard of Class 1A in the Discharge Standards for Pollutants from Municipal Wastewater Treatment Plants

(GB18918-2002) and will be used for greenbelt irrigation and landscaping in the Park.

This WWTP is under the supervision and management of the Environmental Protection Bureau of Lanzhou New Area. According to the survey results, this WWTP can achieve compliant discharge with its effluent meeting Class 1B standard specified in the *Discharge Standard for Pollutants of Municipal Wastewater Treatment Plants* (GB18918-2002), and has not had any non-compliance incidents.

5.3.2 Yanerwan Wastewater Treatment Plant (Lanzhou Zhongtou Water Affairs Co., Ltd)

Yanerwan Wastewater Treatment Plant (Lanzhou Zhongtou Water Affairs Co., Ltd.) , affiliated to Beijing Enfei Environmental Protection Co., Ltd., is located at Yanerwan, Chengguan District, Lanzhou, Gansu Province with a designed treatment capacity of 180,000m³/d. Since Yanerwan Wastewater Treatment Plant (Lanzhou Zhongtou Water Affairs Co., Ltd.) was officially put into operation in June 1998, its wastewater treatment equipment has been operating in excellent condition and achieving a daily average treatment capacity of 125,500m³. Using state-of-the-art wastewater treatment equipment, the WWTP selected secondary biochemical treatment process as its main treatment technology and the treated effluent can satisfy Class 1B standards specified in Discharge Standard for Pollutants of Municipal Wastewater Treatment Plants (GB18918-2002).

This WWTP is equipped with an online monitoring system, which is supervised and managed by Lanzhou Municipal EPB, and environmental monitoring is conducted on a quarterly basis by Lanzhou Municipal Environment Monitoring Station. According to the survey results, this WWTP can achieve compliant discharge with its effluent meeting Class 1B standard specified in the Discharge Standard for Pollutants of Municipal Wastewater Treatment Plants (GB18918-2002), and has not had any non-compliance incidents.

5.3.3 Tianshui Municipal Wastewater Treatment Plant (Qinzhou District Branch)

Tianshui Municipal Wastewater Treatment Plant (Qinzhou District Branch) is located at Dongshili, Qinzhou District, Tianshui, Gansu Province with a designed treatment capacity of 60,000m³/d. Since Tianshui Municipal Wastewater Treatment Plant (Qinzhou District Branch) was officially put into operation in June 2006, its wastewater treatment equipment has been operating in excellent condition and achieving a daily average treatment capacity of 40,500m³. Using state-of-the-art wastewater treatment equipment, the WWTP selected secondary biochemical treatment process as its main treatment technology and the treated effluent can satisfy Class 1B standards specified in Discharge Standard for Pollutants of Municipal

Wastewater Treatment Plants (GB18918-2002).

This WWTP is equipped with an online monitoring system, which is supervised and managed by Tianshui Municipal EPB, and environmental monitoring is conducted on a quarterly basis by Tianshui Municipal Environment Monitoring Station. According to the survey results, this WWTP can achieve compliant discharge with its effluent meeting Class 1B standard specified in the Discharge Standard for Pollutants of Municipal Wastewater Treatment Plants (GB18918-2002), and has not had any non-compliance incidents.

5.4 Social Impact Analysis

The proposed World Bank Loan Gansu TVET Project is related to two project cities of Lanzhou and Tianshui in Gansu Province and involves extensive social impacts, with every step of the implementation process closely related and linked. Smooth implementation of the Project depends, to a very large extent, on the will and attitude of participation of the project stakeholders. In order to support design optimization and effective implementation of the Project, Gansu YishanYishui Center for Environmental and Social Development, entrusted by Gansu Provincial Department of Education, developed the Social Impact Assessment Report for the Project. According to the World Bank safeguard policy, this EMP needs to include social impact assessment and analysis conducted as a part of the social assessment work.

It is concluded in the Social Impact Assessment Report of World Bank Loan Gansu TVET Project that the Project will generate excellent social and economic benefits; the project and its stakeholders are highly compatible with each other; with significant social influence and insignificant and controllable social risks, the Project will contribute remarkably to the development of TVET sector in Gansu Province.

5.4.1 Social Benefits of the Project

(1) The Project will contribute to promotion of teaching competence. Upon completion of the Project, the project schools will expect significantly improved infrastructures and an excellent working, study and living environment will be provided for the teachers contributing to not only stabilization of existing teaching force but also attraction of excellent teachers. The competence building activities designed under the Project will include school-industry partnership, aiming to provide more training opportunities to teachers and promote school management and teaching competence.

(2) The Project will train and provide vocational talents to the society. Improved school infrastructure will provide the students with excellent learning and living environment to facilitate increase of enrollment and significant promotion of students' competence in learning

the occupational skills in a professional and systematic way and provide the vocational talents needed for social and economic development of China.

(3) The Project will contribute to poverty reduction. Research data shows that more than 79% of the students enrolled by vocational and technical schools are poverty-stricken students, who will win more opportunities of employment and stronger ability of revenue generation through systematic vocational education and professional competence training to not only play a leading role in improving their own and their families' livelihood, but also indirectly help other poverty-stricken households overcome poverty. In addition, during the implementation period of the Project, infrastructure construction will generate a large number of jobs. Upon the implementation of the Project, two project schools will be relocated to LND and their normal operation will provide job opportunities to local residents.

(4) The Project will promote urbanization. As a part of its construction efforts, LND attracted investment and settlement of a large number of enterprises. By the end of 2015, 219 enterprises had settled down in LND, including 47 comprehensive enterprises, 53 administrative parks, 19 petrochemical parks, 43 equipment manufacturing parks, 27 economic development zones, 9 bonded zones, 15 agriculture, forestry and water affairs zones and 6 enclaves economic parks. The number of enterprises settling in LND is still growing. The construction of LND will no doubt drive the progress of urbanization and provide schools in the TVET Park with practice and employment opportunities.

(5) The Project will contribute to the spread of the social gender concept. The Project will contribute significantly to the spread and popularization of social gender concept among teachers and students thanks to its content design of competence building and its attentions to career development of female teachers, enrollment and employment percentages of female students and joint administration of infrastructures.

(6) The Project will contribute to the promotion of inclusive development. The Project will, through its interventions in poverty reduction, ethnic minority, social gender, specialty design and competence building, improve the understanding by teachers and students and facilitate the promotion and implementation of the concept of cultural inclusiveness.

5.4.2 Potential Social Risks and Countermeasures

(1) The Project mainly involves potential risks in the following 3 aspects:

1) Grievances : Gansu Finance and Trade Vocational College (founded through the merger of 7 vocational schools) and Gansu Vocational College of Energy and Chemical (founded through the merger of 4 vocational schools) will be moved from the urban area of

Lanzhou to the TVET Park in LND. Additional time of commuting from the teachers' residences to the new campuses and inconvenience for female teachers in taking care of their children and parents may lead to some grievances.

2) Risks from occupational transformation of teachers and specialty adjustment for students: 59.47% of the teachers in the project schools will be transformed from teachers of secondary vocational schools to tertiary vocational schools. With the merger of Gansu Finance and Trade Vocational College and Gansu Energy & Chemical Technical College, some specialties will be cancelled. Therefore, teachers transforming from a secondary vocational school to a tertiary vocational school will find themselves in immediate risks if they fail to promote their specialty competence and teaching skills. Also with the merger of these schools, some specialties will no longer exist and students will find themselves in risks of choosing a second specialty.

3) Risks of decreased income for land-depleted farmers: Both schools will build new campuses in LND and need to acquire 2,232 mu of land, resulting in 260 farming households losing their land to different degrees (from 0.31 to 18 mu per household). Despite of the replacement livelihood measures developed by LND for affected farmers, including pension insurance, employment, reemployment training, etc., these farmers still have the potential risks of income decrease or instability.

(2) On the basis of interviews, discussions, questionnaires and comprehensive analysis of first-hand and second-hand data, the social assessment team proposed the following measures against the potential risks of the Project:

1) Grievance redress measures: It is recommended that a stable and transparent communication channel is established by GDoE, Gansu Provincial PMO and the project school management to address the various problems encountered in the operation period of the Project. Regarding the potential grievances from some teachers of the 2 merged schools, in addition to active efforts in promoting the Project, the respective project schools should set up a sound communication mechanism and a grievance redress mechanism and create a comfortable working and living environment for the teachers so as to enable them to get free from family worries and concentrate on teaching activities.

2) Measures to address risks of teacher transformation and student specialty adjustment: As a part of the competence building activities under the Project, specific contents should be designed for teachers pending transformation to promote their competence and help them adapt themselves to the new specialties at the fastest possible speed. Regarding students pending

specialty adjustment, the concerned project schools should adjust the affected students to new specialties based on market demand and free will of students, and, if necessary, provide them with psychological counseling.

3) Measures to address the risks of income decrease for land-depleted farmers: It is recommended that the LND government authorities continue improving the pension insurance and unemployment insurance policies and consult the LND enterprises or institutions on providing preferential policies and safeguards for local land-depleted farmers to get long-term and stable jobs. The project schools can also provide employment opportunities during the implementation of the Project to local land-depleted farmers, in particular, women, poor households and disabled individuals. In addition, stronger efforts should be made in training for land-depleted farmers to increase their employment rate.

In short, implementation of the Project will generate significant impacts on TVET development in Gansu Province; the various stakeholders are highly compatible with the Project; and the social risks are insignificant and controllable.

5.4.3 Recommendations

In order to facilitate realization of the project development objectives (PDOs), expansion of project outcomes, and increase of project influences and exploration of replicable, reproducible and innovative project experiences, the SA Team makes the following recommendations:

(1) Project monitoring and evaluation (M&E) should be implemented. It is recommended that the Provincial PMO engages an experienced independent M&E agency during the implementation period of the Project to carry out the M&E of the project execution and implementation outcomes, develop M&E indicators and provide the PMO and WB with an independent M&E report and make timely corrections to any possible deviations during project implementation and assure the achievement of the anticipated project development objectives.

(2) Attention should be paid to social gender sensitivity. In China, the level of recognition of social gender among all trades and sectors is very low. It is recommended that the project beneficiary schools pay more attention, in their specialty design, to disciplines and fields more suitable for female to study in school and get employed after graduation; significant improvements should be made to the accommodation conditions of girl students and the design of women's lavatory based on the physiological characteristics of female through implementation of the Project. The existing toilets in the project schools, for instance, do not have enough latrine pits and the women's washrooms are more narrow and crowded. It is

recommended that the aforesaid factors are incorporated into the design of the teaching and office buildings to be constructed utilizing the World Bank loan so that the toilets will provide adequate number of latrine pits and the girl's washrooms and dormitories will have adequate space. Accounting for nearly 50% of the faculty in TVET schools, female teachers, however, are obviously in a disadvantaged position in terms of professional title promotion, management team membership and continual education. In such a context, it is recommended that the percentage of female teachers arranged to take part in teacher training should not be less than 45%. The 2 project schools to be moved to LND should take full account of the rights and demands of female teachers since the female teachers will need to travel more frequently between LND and the urban center in order to take care of their parents, children and families.

(3) Attention should be paid to the poverty-stricken students. Poverty-stricken students account for up to 79% of the total number of students in the project beneficiary schools. It is recommended that the project beneficiary schools will pay attention to the poverty-stricken schools from the perspectives of psychological counseling, preferential policy, employment and scholarships and grants. Systematic sponsorship policies favorable to the study and employment of poverty-stricken students should be developed to conform to the World Bank goals of "Ending Extreme Poverty and Boosting Shared Prosperity" and the Chinese policy of "targeted poverty alleviation".

(4) The project schools should promote their management competence and improve their management concepts. Management plays a crucial role in TVET schools. However, the reality is that the project beneficiary schools, not on the same level, even have no long-term planning of school management. Teachers and students in some schools already expressed their grievances about the school management. It is recommended that the project schools will take this World Bank loan project as an opportunity to draw on the state-of-the-art management experiences of the international TVET schools, train their management professionals and realize target-based management in the real sense to incorporate teacher performance management, social gender concept, school-industry partnership, teacher competence promotion and student employment capability management and competence-based education into their system of performance appraisal indicators.

(5) It is recommended that the following theme studies are designed as a part of the theme studies financed under the Project to lay a basis for realization of the innovations and objectives of the World Bank Project: A. Gansu TVET Project Policy and Case Studies in Successful School-industry Partnerships Home and Abroad; B. Study in Promoting the Level

of Internationalization of TVET Teachers and Social Gender Concept; C. Study of Student Training Model and Participatory Teaching and Management in TVET Schools;

(6) TVET institution interdisciplinary cooperation and forums should be organized. It is recommended that the Provincial PMO should organize interdisciplinary cooperation and salons and working teams comprising of technical professionals from industries, backbone teachers from key specialties of educational institutions should be set up to address issues concerning talent training and market demand, carry out specialty design and building and align with the needs of industries and jointly develop teaching and practical training programs; 2 tailored forums or salons should be organized each year for the project schools, inviting TVET school management and teacher representatives and experts to discuss and communicate about the current status, development tendency and trends and innovative cases of TVET sector.

5.4.4 Summary of Social Impact Analysis

After the World Bank Loan Gansu TVET Project is implemented, excellent social and economic benefits will be generated; With highly compatible stakeholders, significant social influence and insignificant and controllable social risks, the Project will generate significant impacts on the development of TVET sector in Gansu Province. (See Table 5-18 for detail.)

Table 5-18 Schedule of Social Impacts of Gansu TVET Project

SN	Project Component	Positive Impacts	Negative Impacts	Solutions to Negative Impacts
1	Impacts on female teachers	<p>1)Female teachers will be provided with more spacey and comfortable office facilities and conditions. Upon the implementation of the Project, the new campuses of Gansu Finance and Trade Vocational College and Gansu Vocational College of Energy and Chemical will be built up in LND TVET Park and a number of comprehensive buildings and teaching buildings will be built up in the other three project schools, providing the female teachers with better office and teaching facilities and conditions. Improved experimental, practice and practical training facilities and conditions will help promote the work efficiency of teachers.</p> <p>2)Female teachers will be provided with more training opportunities. In addition to infrastructure construction, competence building contents are also included in the design of the Project, e.g. specialty building, curriculum building, teaching force building, etc. The project schools will enforce relevant policies to fund this series of competence building activities, which will provide the teachers with more training opportunities, including arranging teachers to take part in external training, promoting teachers educational background and technical title, and female teachers will be among the beneficiaries.</p> <p>3)Female teachers will benefit from higher incomes. This Project involves 14 schools in total, 11 of which will be transformed from secondary specialty school to vocational colleges. School upgrading will help increasing the income of teachers to a certain extent and female teachers will benefit too. In addition, implementation of the Project will be helpful to promoting teachers' education background and technical title, which will also contribute to higher</p>	<p>1)GFTVC and GVCEC to be constructed under the Project will be located in LND TVET Park far away from the urban center of Lanzhou City. However, the residences of the great majority of the teachers are located and scattered in the urban center. Commuting from the urban center to LND will take more time and create adverse impacts on female teachers, in particular pregnant teachers. In addition, accommodation is an issue to be addressed for teachers who need to take a nap at noon or give lectures or do experiments and tests at night.</p>	<p>1)Decoration pollution should be addressed from two aspects. First, the construction quality standards should be promoted and the various construction works should be completed on schedule. Environment-friendly materials should be selected in the decoration process to control pollutant at the source. Second, more scientific and human-centered management skills should be introduced. After the schools are moved to LND, ventilation frequency should be increased and green vegetation absorbing pollutants should be planted indoors; reasonable time table should be developed to reduce lengthy indoor activities.</p> <p>2)In order to address the issue of accommodation for the school faculty in LNC TVET Park, Phase I project of Wenqu Lake Jingyuan Residential Area and business complex will be constructed. This residential area is located in LND north of Wenqu Road, south of Chuangzhixi Road, east of a planned road and west of Wenquxi Road. With a total building area of 549,500 m², LND Wenqu Lake Jingyuan Residential Area Project will comprise of medium to high-end commercial residential buildings, supporting business facilities, community service center, kindergarten, police substation, underground garage, food market, etc. and will include supporting facilities of water supply, electricity, fuel gas, heating and ventilation and landscaping.</p> <p>3)Commuting bus lines will be opened between</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

		income for female teachers.		LND TVET Park and Lanzhou Urban Center and reasonable bus routes, stops and time table will be developed to reduce waiting time and make teacher commuting easier.
2	Impacts on girl students	<p>1) Upon implementation of the Project, the project schools will expect extremely improved infrastructure and hardware conditions. Gansu Finance and Trade Vocational College and Gansu Vocational College of Energy and Chemical will build new campuses in LND TVET Park while the other three schools will build a number of comprehensive buildings and teaching buildings. In addition, the classrooms, laboratories and practice bases on the project schools will have improved environment.</p> <p>2) Upon implementation of the Project, school-industry partnership will be strengthened in both depth and extent of partnership, providing more practice and employment opportunities for girl students, who can acquire new technical skills and promote practical operation abilities through school-industry partnership.</p> <p>3) GFTVC and GVCEC are merged from multiple schools and their greatly increased strength in school management will benefit girl students on campus.</p> <p>4) Thanks to the expanded scope of the two new schools, girl students will expect expanded scope of communication, enabling them to improve their abilities of interpersonal interaction and employment.</p>	<p>1) The long distance from the new campuses of GFTVC and GVCEC to the urban center will result in travelling and daily life inconveniences and increased costs of living for girl students.</p> <p>2) The long distance from the new campuses of GFTVC and GVCEC to the urban center will generate short-term impacts on the practice and practical training activities of students of some specialties.</p>	<p>1) Commuting bus lines will be opened between LND TVET Park and Lanzhou Urban Center and reasonable bus routes, stops and time table will be developed to reduce waiting time and provide preferential fare to students.</p> <p>2) LND has introduced 281 industrial projects in total involving a total investment of CNY 388.3 billion covering multiple sectors such as equipment manufacturing, biomedicine, high- &-new technology and modern services. The two schools in LND will take advantage of their geographical location and establish off-campus practice and practical training bases. In addition, students of these schools will also embrace more opportunities of employment.</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

3	Project impacts on poverty-stricken students	<p>1)Thanks to the implementation of the Project, school-industry partnership will be strengthened in both depth and extent and more practice and employment opportunities will be provided for poverty-stricken students. Strengthened school-industry partnership will enable the poverty-stricken students to acquire new technical skills and promote their practical operation abilities and will also provide them with employment opportunities and their poverty-stricken families with opportunities of poverty alleviation.</p> <p>2)After the merger of GFTVC and GVCEC, a secondary and tertiary TVET integration model will be implemented to provide opportunities of continual education for poverty-stricken students. The school merger will broaden the horizon of the poverty-stricken students and promote their interpersonal interaction abilities.</p> <p>3)Improved school infrastructure will provide the poverty-stricken students with an excellent study and living environment. Construction of the library and shower rooms, for example, will make study and daily life in school more convenient for poverty-stricken students.</p> <p>4)Teachers will receive technical skill training thanks to the implementation of the Project and acquire stronger ability to teach academic knowledge to poverty-stricken students in a more systematic and comprehensive way and the students' technical skills and employment abilities will be promoted.</p>	<p>1)The long distance from the new campuses of GFTVC and GVCEC to the urban center will result in travelling and daily life inconveniences and increased costs of living, time and traffic for poverty-stricken students. Taking Gansu Coal Industry School to be moved to LND as an example, the price level of Pingchuan District, Baiyin City, the existing site of the school, is lower than Lanzhou City. Merger of the 7 schools means increase of living and traffic cost for the poverty-stricken students and heavier burden for some families. After GFTVC and GVCEC are moved to LND, the long distance to the urban center will result in longer time of travelling and certainly increased costs of time for students.</p> <p>2)After GFTVC and GVCEC are merged, some specialties will be merged or cancelled and the affected poverty-stricken students will have the risks of specialty adjustment.</p>	<p>1)The project schools should provide more part-time jobs for poverty-stricken students. For example, fixed commodity stalls may be set up on campus to provide the poverty-stricken students with chances of on-campus work as a means of financial support to their academic career.</p>
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6. Environmental Management System

This Project has a relatively large coverage and complex composition of components. In order to minimize negative environmental impacts during project implementation, it is necessary to assure that the environmental management actions designed for the Project are implemented in the full process of project construction and operation. According to the respective requirements and actual needs, in addition to the supervisory duties and functions to be performed by law by the environmental protection authorities, special personnel will be assigned in the PMOs of all levels to be responsible for environmental management and an environmental management system comprising of a supervision agency, implementation agency and consulting service agency will be established to better achieve the demonstrative effect of the Project.

6.1 Configuration of Environmental Management Agencies

Details of the configuration of the environmental management agencies in the construction period of the Project are shown in Table 6-1 and Figure 6-1. The logistics service bodies of the project schools will be responsible for environmental management in the operation period.

Table 6-1 Agencies Involved in the Environmental Management System in the Construction Period

Nature of agency	Name of agency	Mission of agency
Management agency	Provincial PMO	Responsible for project implementation and management, assigning full-time environmental management personnel, implementing the environmental protection activities in the planning, design and implementation periods of the Project, developing working procedures to meet the domestic and WB requirements on environmental assessment and environmental management, responsible for supervising EMP implementation and assuring that the environmental mitigation measures are incorporated into the tendering documents and contract documents.
	Project Implementation Office of the Project Schools	Responsible for implementation of the respective project component, assigning a full-time environmental protection officer to be mainly responsible for final acceptance of the environmental protection aspect upon the completion of the Project and routine environmental supervision and management in the construction period of the Project to minimize or reduce the adverse environmental impacts of the Project to an acceptable level and in the meanwhile fully realize the environmental benefits of the Project; assuring that fund needed for the environmental protection activities of the Project are available and the relevant documents are prepared and put into archives.
Supervision agency	Environmental protection authorities of the project school cities	Performing the supervision and inspection duties and responsibilities of a government supervision and administration body to assure that the working procedures of the Project satisfy the environmental management requirements of China and the pollution prevention and control measures in the implementation process meet the needs of environmental protection of China.

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

	World Bank	Assigning an Environment Specialist and supervising and inspecting the implementation of the Environmental Protection Implementation Regulations.
Consulting service agency	EIA Consultant	Accepting a commission to prepare the Project's EMP;
	Design Consultant	Accepting a commission to prepare the feasibility study report and construction design program and assure that the measures and programs included in the EMP are included in the outcomes.
	Environmental Supervision Agency	Accepting a commission to supervise and manage the routine production activities of the construction contractors.
	Environmental Expert Panel employed by the Provincial PMO	Assisting the Provincial PMO in inspecting the environmental management work of the project components and providing guidance to the EIA agencies and implementation agencies needed for proper design and implementation of the various environmental protection measures.
Implementation agency	Civil works contractors	Providing a site environment supervision engineer, implementing the environmental protection and water and soil conservation requirements included in the contract and tendering and bid documents, satisfying the environmental protection requirements of the World Bank as well as the local environmental protection authorities and developing and submitting construction checklists.
Monitoring agency	Environmental monitoring agencies	Responsible for environmental monitoring activities in the operation period of the Project as a qualified environmental monitoring agency.
Note: Staffing details of the aforesaid agencies are shown in "5.2 Responsibilities and Staffing of Agencies Involved in the Environmental Management System".		

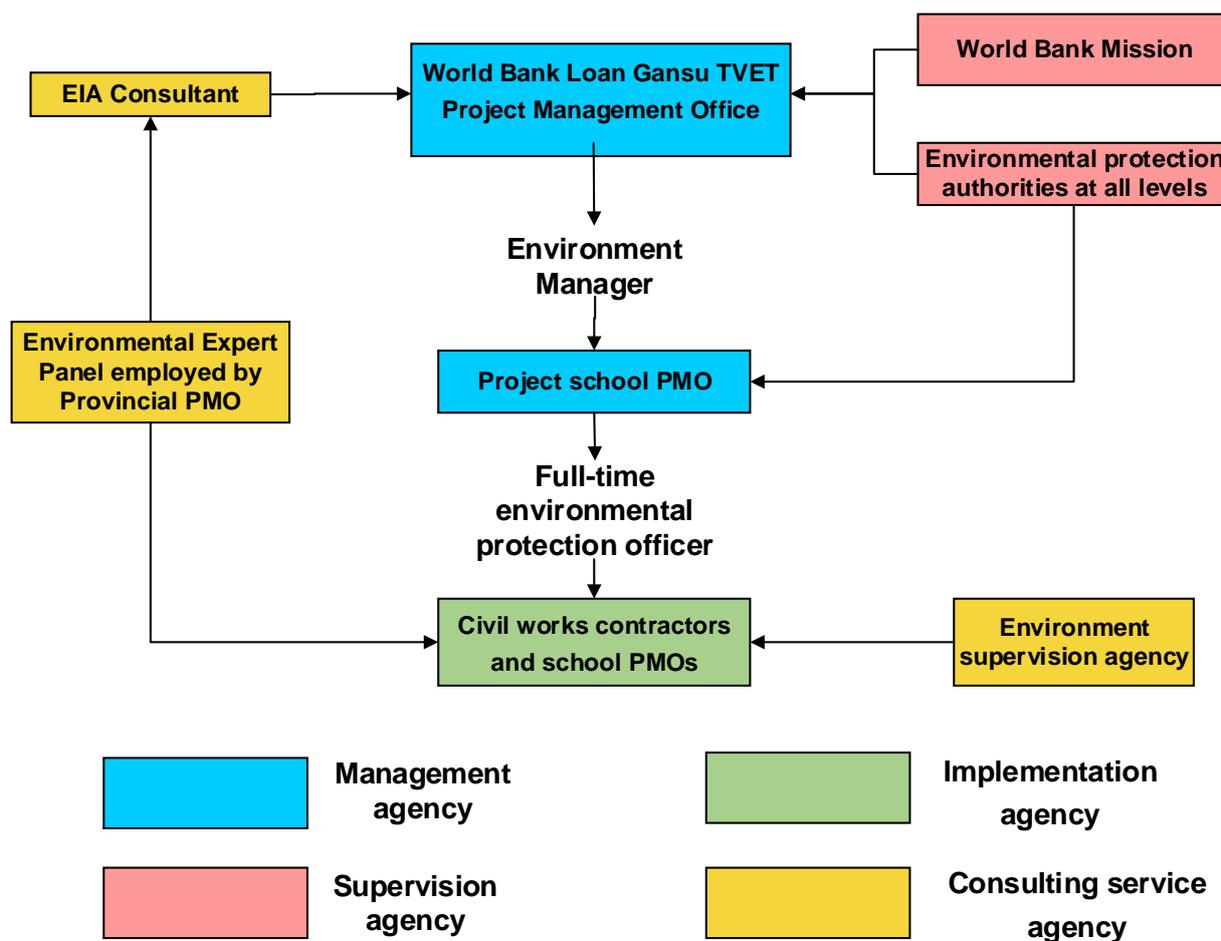


Figure 6-1 Organizational Framework of Environmental Management in the Construction Period

6.2 Responsibilities and Staffing of Agencies Involved in the Environmental Management System

Agencies involved in the Project’s environmental management system include project management agencies, supervision agencies, implementation agencies and consulting service agencies. These agencies, each an integral part of the environmental management system, undertake different missions and have different duties and responsibilities. The Project will be implemented under the organization and leadership of the Provincial PMO and the project school PMOs to assure that the Project is constructed in accordance with the respective stipulations and requirements of both China and World Bank regarding the various working procedures as well as the implementation of pollution prevention and control measures. Table 6-2 below shows the responsibilities and staff configuration of the various agencies under the Project.

Table 6-2 Duties & Responsibilities of the Agencies Involved in the Environmental Management System

Name of agency	Type of agency	Size of Staff	Duties & Responsibilities
Environmental protection authorities at all levels	Supervision agency	1 person	<ol style="list-style-type: none"> 1. Conducting full-process environmental supervision and management for the Project by law, including approval of the Project's EIA report (including the EIA activities of the project components) as well as environmental supervision and management in the construction and operation periods.
Provincial PLG and PMO	Management agency	1 person	<ol style="list-style-type: none"> 1. Preparing and supervising EMP implementation; 2. Causing and coordinating the enforcement of the domestic and WB environmental management requirements; 3. Submitting relevant reports to the World Bank on a semi-annual basis; 4. Inspecting the environmental management work of PMOs at all levels; 5. Coordinating with the other relevant authorities in addressing significant environmental issues; 6. Engaging an Environmental Expert Panel to carry out inspections of the Project;
Project Implementation Office of Each Project School	Management agency	1-2 persons	<ol style="list-style-type: none"> 1. Preparing and supervising the implementation of the environmental management rules and regulations of the project components; 2. Organizing the development and approval of domestic EIA documents; 3. Making sure that the project design meets the EIA requirements; 4. Including the environmental protection measures in this EMP into the construction contracts of the Project; 5. Employing, supervising and coordinating the work of construction supervision engineers (qualification, responsibilities and management); 6. Organizing the implementation of the environmental management training program; 7. Organizing theme studies or relevant investigations; 8. Properly recording, sorting and addressing public complaints and appeals arising in the construction and operation periods and interpreting the results to the public; 9. Reviewing the environmental supervision and environmental consulting reports; 10. Submitting reports (statements) to the Provincial PMO on a quarterly basis; 11. Receiving and reviewing site checklists submitted by construction contractors and supervision agency to verify environmentally sensitive problems, with records put into archives; 12. Accepting environmental work inspections (including World Bank project missions)
World Bank	Supervision agency	1 person	<ol style="list-style-type: none"> 1. The World Bank assigns missions on a yearly basis to carry out special project implementation inspections; 2. Inspecting the execution of loan agreement and implementation of the EMP of the Project.
Units with qualifications for EIA of construction projects	EIA agency	3 persons	<ol style="list-style-type: none"> 1. Carrying out site investigations and environmental assessment of each project component; 2. Responsible for EMP preparation;
Environmental Expert Panel	Consulting service agency	1-2 persons	<ol style="list-style-type: none"> 1. Carrying out site inspections of the construction sites and contractors and assisting the Provincial PMO in inspecting the environmental management work of each project component;

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Name of agency	Type of agency	Size of Staff	Duties & Responsibilities
engaged by Provincial PMO			<ol style="list-style-type: none"> 2. Providing guidance to EIA agencies and IAs to properly carry out the design and implementation of environmental protection measures, drafting and submitting reports and providing suggestions and opinions to the Provincial PMO on implementation of the environmental protection activities; 3. Identifying school variations, preparing checklists and making comments on school variation selection.
Construction Supervision Engineer (responsible for environmental supervision)	Consulting service agency	1-2 persons	<ol style="list-style-type: none"> 1. The Supervision Engineer will be separately engaged by the Provincial PMO or local PMOs; 2. Supervising and inspecting domestic wastewater treatment, production wastewater treatment, soil erosion prevention measures, exhaust gas, dust and noise control measures, production and domestic solid wastes and sediment treatment, health and disease control on the construction sites; 3. Preparing on a periodical basis the various environmental management checklists (Attached Table 1) included in the annexes of the EMP; 4. Proposing and following up with rectification solutions to environmental protection problems encountered by the construction contractors in the construction activities, including issuing Rectification Notice (Attached Table 2) and rectification checklists and putting the inspection documents into archives; 5. Assuring that the construction contractors prepare and submit reports on a weekly basis about the implementation status of the construction works to the county (city, district) PMOs.
Civil works contractor and school principals	Implementation agency	Several	<ol style="list-style-type: none"> 1. Developing environmental protection measures in the construction period; 2. Accepting environmental protection supervision and inspections conducted by the Supervision Engineer, the World Bank and the environmental protection authorities at all levels; 3. Setting up a feedback mechanism and carrying out the rectification within 3 working days (or 10 working days where coordination is required from the management agency) as of receipt of the Rectification Notice; 4. Completing the construction checklist (Attached Table 1) together with the construction supervision engineer before construction and submitting the checklist to the project school PMO; 5. The construction contractors will report on a weekly basis the implementation status of the construction works to the supervision engineer.

6.3 Environmental Management Tasks in Different Periods of the Project

As shown in Figure 6-2, the Project involves different environmental management tasks in different periods of project implementation.

The most important mission of EMP is to assure that all the environmental protection measures are actually and effectively implemented, including: (1) the environmental protection measures in the EMP are incorporated into the design and construction contracts of the Project; (2) the construction contractors' performance in implementing the environmental protection measures in the construction period of the Project is supervised through the environmental supervision engineer, and the effectiveness and implementation status of the environmental protection measures are inspected; (3) project acceptance and project operation period are well

supervised and managed and mechanisms for EMP inspection, reporting and filing are established; time efficiency of the work activities is demonstrated through routine inspection.

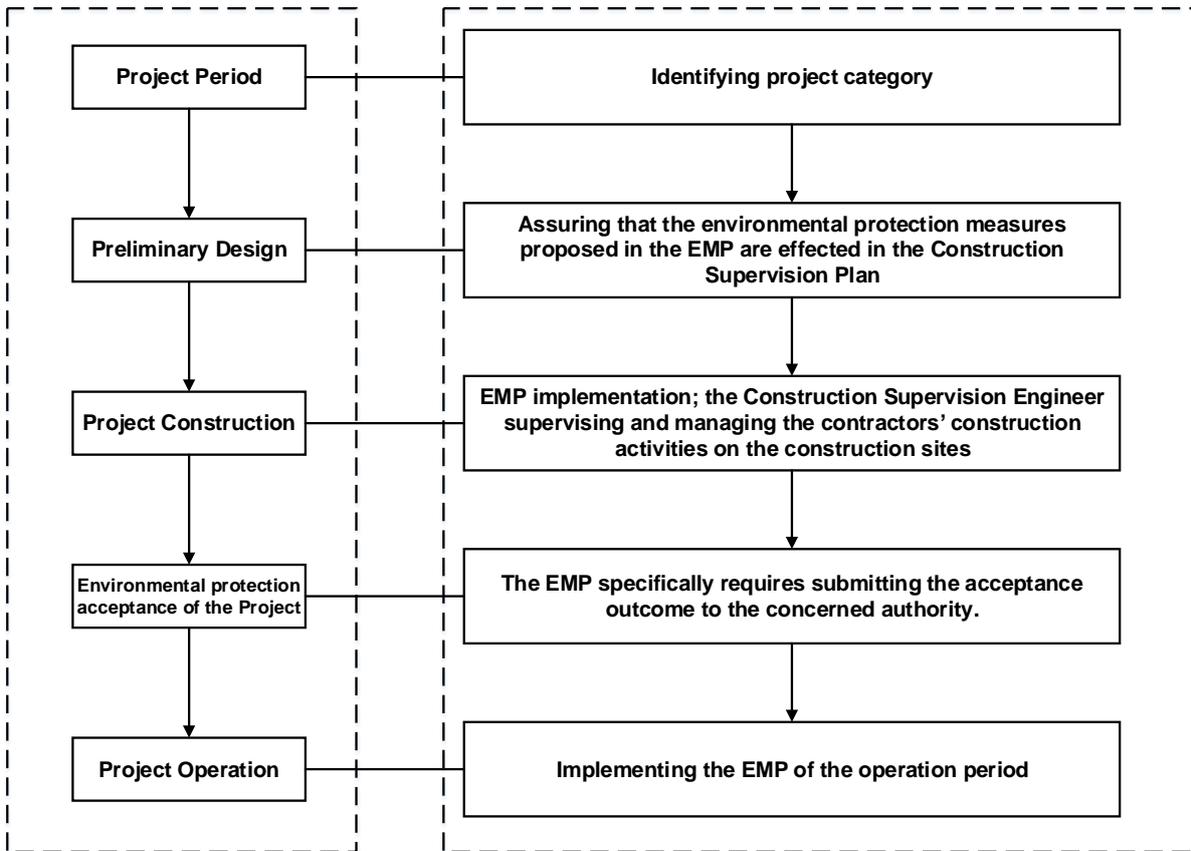


Figure 6-2 Environmental Management Tasks in Different Periods of the Project

6.4 Environmental Supervision

6.4.1 Objectives

In the construction period of the Project, the construction supervision engineer (also responsible for environmental supervision) should carry out the environmental supervision tasks of the construction period based on the environmental protection design requirements, fully supervise and inspect the progress and effectiveness of the environmental protection measures implemented by each construction contractor and handle and settle in a timely manner any environmental pollution incidents as they arise. In addition, the supervision outcomes in the construction period will serve as the basis for implementing the project acceptance activities and a special report needed for the acceptance report.

6.4.2 Contents

Abiding by the national, local and World Bank guidelines, policies, bylaws and regulations of environmental protection and supervising and making sure that the environmental protection clauses included in the construction contracts are executed by the contractors. The key responsibilities include:

- 1、Preparing the environmental supervision plan and proposing and determining environmental supervision items and contents;
- 2、Reviewing the environmental protection clauses included in tendering and bid documents of the construction works;
- 3、Supervising the contractors' activities and preventing and mitigating environmental pollution and wildlife damages arising from construction activities and in the meanwhile preventing fire accidents;
- 4、Fully supervising and inspecting the progress and effectiveness of the environmental protection measures implemented by each construction contractor and handling and settling in time any environmental pollution incidents as they arise based on the survey and monitoring data;
- 5、Fully inspecting treatment and restoration of slag disposal pits and construction slashes that the construction contractors are responsible for, mainly including slope stabilization, site restoration and landscaping and greening rate, etc.;
- 6、Assuring the implementation of environmental monitoring, reviewing the relevant environmental reports, proposing construction management requirements based on the water quality, ambient air and noise monitoring results to minimize adverse environmental impacts

caused by the construction activities;

7、 Properly preparing supervision notes and reports as a part of the routine work activities and participating in final acceptance of the construction works.

6.4.3 Work Flow for Environmental Supervision Engineer to Implement the EMP in the Construction Period

Environmental supervision is an important part of environmental management with relative independence. Therefore, an independent environmental supervision agency should be established and organizations with required qualifications should be assigned with the tasks of environmental supervision to supervise, review and evaluate the contractor's performance in executing the environmental protection measures following the requirements of the contract documents and the national environmental protection laws, regulations and policies and based on the environmental monitoring data and inspection results and identify and correct in a timely manner any construction behaviors' violating the contract clauses and national requirements of environmental protection. The environmental supervision engineer should inspect the construction sites at least once a week and prepare and put Construction Management Checklists (Attached Table 1) in archives. Rectification plans should be proposed for environmental problems existing in the contractors' construction activities and followed up and implemented, with reports submitted to the project schools and put into archives on a monthly basis. The project schools should submit reports to the Provincial PMO and put them in archives on a quarterly basis while the Provincial PMO should report to the World Bank specialist on a semi-annual basis. See Figure 6-3 for the flowchart of environmental supervision in the construction period.

mandatory environment, health and safety training.

6.5.2 Trainees

The trainees include staff of the Provincial PMO, the project school PMOs and the environmental supervision agency and representatives of the environmental monitoring agencies and key contractors.

6.5.3 Training Contents

- 1、 Knowledge and application of World Bank environmental policies and domestic environmental protection laws and regulations, environmental standards;
- 2、 Environmental management models of World Bank loan projects and environmental clauses in the loan agreement;
- 3、 EMP of each project component;
- 4、 Environmental management requirements of each project component;
- 5、 Responsibilities and relationships of environmental management personnel, environmental supervision personnel, environmental monitoring personnel and contractors;
- 6、 Environmental management work report, environmental supervision work report and environmental monitoring report.

6.5.4 Training Fund

Fund for EMP training in the construction period of World Bank Loan Gansu Technical and Vocational Education and Training Project will be included in the project budget while fund for training in the operation period will be included in the operation and maintenance cost. The total training fund is 185,000 yuan, see Table 6-3 for details.

Table 6-3 Competence Building and Training Schedule

Trainee Organization	Organizer	No. of Trainees	Training Period	Training Time	Training Duration	Training Cost	Training Method	Training Objectives and Contents				
Provincial PMO	Provincial PMO	1	During construction	Before construction	3 days	CNY 5,000	Environmental protection specialists will be invited to provide centralized training.	Objective: to make sure the environmental protection measures proposed in the EIA Report are actually enforced. Contents: (1) environmental protection laws, regulations and standards as well as environmental management knowledge of construction projects; (2) basic knowledge of environmental monitoring; (3) stipulations on environmental supervision and law enforcement; (4) environmental engineering and supervision technologies; (5) environmental management standard system and basic qualification training of management staff.				
GVCEC PMO		3				CNY 15,000						
GFTVC PMO		3				CNY 15,000						
GSTSM PMO		3				CNY 15,000						
LUAS PMO		3				CNY 15,000						
Contractor	School PMO	3 person/school			Representative of construction workers	2 days			CNY 15,000/school	(1) Environmental protection laws and regulations, codes and principles of environmental protection practices; (2) Implementation of EMP in the construction period		
Construction Worker Training Plan	School Contractor								CNY 10,000/school, to be borne by construction contractor and included in construction contracts			
Subtotal of construction period						CNY 165,000						
GVCEC PMO	Provincial PMO	1			During operation	Before operation			2 days	CNY 5,000	Environmental protection specialists will be invited to provide centralized training.	(1) Environmental safety rules and regulations and specifications; (2) Risks, accidents and emergency response plans
GFTVC PMO		1								CNY 5,000		
GSTSM PMO		1	CNY 5,000									
LUAS PMO		1	CNY 5,000									
Subtotal of operation period						CNY 20,000						
Total						CNY 185,000						

6.6 Public Grievance Redress and Feedback Mechanisms

6.6.1 Public Grievance

The Project's grievance redress mechanism (GRM) covers all periods of project

implementation, including pre-construction investigation, construction period disturbance and operation period supervision.

(1) Pre-construction Public Consultation

In the pre-construction EIA period, public consultation will be implemented in the forms of discussions and questionnaires. The public may express their opinions at such discussions or by preparing and submitting questionnaires distributed by or requested from EIA agency; the public may also submit their opinions to the implementation agency or EIA agency by mail, telephone, fax or email or submit their complaints and appeals to the EPBs and Complaint Offices in the project counties (cities or districts).

(2) Public Grievances in the Construction Period

The implementation agencies of the proposed project should set up safety and civilized construction information bulletin boards and be constantly aware of construction progress and inconveniences brought by the construction activities to local people. A special reception desk should be set up, special personnel assigned and contact telephone number disclosed to allow for timely collection of public opinion. Public Opinion Notebooks should be provided to keep timely records of names and contact information of incoming telephone calls or visitors, impacts caused by project implementation on the public as well as the public opinions and comments. The implementation agencies are required to respond to questions raised by the public within 3 working days and propose and implement solutions within 10 to 15 working days depending on the level of difficulty, with the implementation process and final outcomes of coordination and resolution recorded in the Public Opinion Notebook and submitted to the project school PMOs.

(3) Operation Period Supervision

If any problems arise in the operation period, the public may directly put forward such problems to the project school PMOs and the project school PMOs will keep records and study, discuss and give a response to such problems within 3 working days and propose and implement a solution within 10 to 15 working days depending on the degree of difficulty.

The Environmental Management Department of the project school PMOs should set up a GRM tracking and recording system to: 1) develop tracking tables and tracking procedures to collect information from project personnel and appellants; 2) assign a special personnel to update database information periodically; 3) establish an information analysis system to identify causes of grievances, increase transparency of grievance redress procedure and evaluate the overall operation of such mechanism on a periodical basis; 4) set up procedures

for informing the stakeholders of grievance redress progress; and 5) reporting the status of grievance redress to the Provincial PMO and WB on a periodical basis.

See Figure 6-4 for the grievance redress mechanism of the Project.

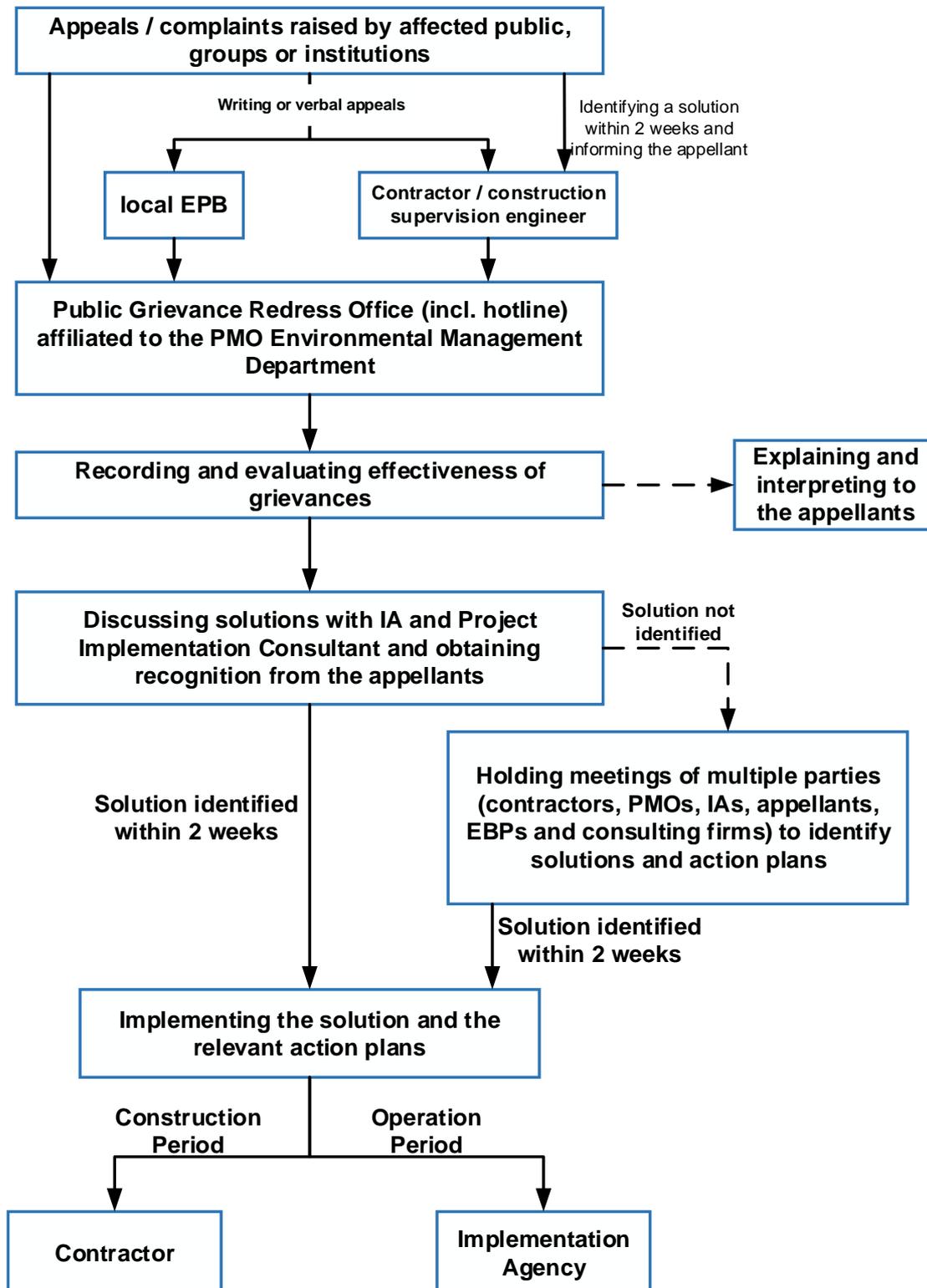


Figure 6-4 Illustration of the Grievance Redress Mechanism of the Proposed Project

The GRM will be open to all local residents to allow all affected persons, groups or

institutions to send their complaints and appeals via telephone, mail, email and other media. Before project commencement, the contact persons at each step of the grievance redress procedure will be determined (e.g. concerned school managers, contractors, IA environmental management personnel, local EPB officials, etc.) and their contact information (e.g. telephone numbers, addresses and email addresses, etc.) will be disclosed in the information bulletin board on construction sites or the websites of local governments.

6.6.2 Feedback Mechanism

Based on the environmental monitoring reports and the inspections of the supervision agencies, relevant adjustments will be made in the EMP to the mitigation measures to facilitate further improvements to the environmental management activities.

If any significant discrepancies are noted during the inspections from the contents of the EMP or any huge adverse environmental impacts or significant increase of persons affected by such adverse environmental impacts are caused by project variation, the PMO will immediately consult the environmental agency and the environmental assessment teams established by the World Bank for additional EIA and, if necessary, additional public consultation. The IAs and the contractors should also be advised to implement the revised EMP.

7.Environmental Management Plan

7.1General impacts and mitigation measures in the construction period

The following prevention and mitigation measures are proposed for the adverse impacts generated by the civil works of each project school in terms of air environment, water environment, sound environment and solid wastes:

7.1.1 Construction site management

7.1.1.1 Environmental impacts generated by the construction sites

Construction camps, construction material storage and transportation, construction time and construction vehicles will generate impact of different levels on the local environment. Construction camps and construction material storage require occupation of land on campus and generate significant impacts on vegetation and environment on campus in the affected area; construction vehicles, construction material transportation and construction plants and equipment generate noise and traffic jam generate significant impacts on the objects of sound environment protection and road transportation in the project schools and their neighborhood. Such impacts will be maximized in particular when the construction time is not reasonably scheduled or overtime work is involved. In addition, construction wastewater and exhaust gas generated by construction plants and equipment will have certain impacts on local surface water and air environment.

Construction sites generate relatively significant environmental impacts, which are however limited in certain time and will disappear as the construction works are completed.

7.1.1.2 Construction site management measures

The construction contractors of the Project must strictly enforce the following management measures to minimize the adverse environmental impacts generated on the construction sites.

(1) Working hours

The working hours on the construction sites are 7:00 am to 22:00 pm. Construction is banned during the noon hours of 12:00 to 14:00 and restricted at night. Where night construction becomes inevitable, a notice should be given to the local residents and relevant formalities fulfilled and actions taken to reduce impacts on residents. The arrival and departure time of construction transportation vehicles must comply with the requirements of local governments;

(2) Construction camp arrangement

If possible, the construction contractors should rent local residential houses in the project area for lodging and accommodation and avoid locating the construction camps and canteens

on the construction sites, where only offices and material stockpiling sheds are allowed.

(3) Traffic safety

1) Best traffic safety practices should be adopted in all aspects related to transportation during the construction of the Project to best avoid traffic accidents and reduce casualty of both project personnel and general public. In such a context, the following measures should be taken:

① Drivers should be made particularly aware of the importance of safety rules;

② Driving skill should be improved and all drivers must be licensed;

③ Driving time should be limited and driver duty shift schedule developed to avoid fatigue driving;

④ Dangerous road sections and driving in the dangerous hours of a day should be avoided to minimize accident probability;

2) Vehicle maintenance should be conducted on a periodical basis and manufacturer approved spare parts used to avoid serious traffic accidents resulting from equipment failure or premature failure of parts and components.

3) All efforts should be made to reduce simultaneous occupation of roads by pedestrians and construction vehicles;

4) Road signs and visibility should be improved in cooperation with local communities and competent authority to promote the level of road safety as a whole, in particular on roads adjacent to schools and other areas where children are present. Traffic and pedestrian safety education campaigns (e.g. advertisement activities in schools) should be organized in cooperation with local communities;

5) A mechanism should be established for coordination with the emergency response personnel to assure that appropriate first aid is available in case of any accidents;

6) Local materials should be used where possible to shorten haulage. The relevant facilities (e.g. worker dormitories) should be located adjacent to the project sites to avoid increase of traffic flow;

7) Traffic safety control measures should be taken and road signs and signalmen should be used to warn pedestrians and traffic against dangers.

(4) Spoils and Construction Solid Wastes

Spoils and construction solid wastes should be stockpiled at landfills designated by local environmental sanitation authority and should not be dumped at free will.

(5) Public Information Platform

① Construction data plates should be installed at obvious positions to indicate the project name, construction site area, names of project implementation agency, construction contractors and supervision and administration agencies as well as names of project responsible person, dates of construction commencement and completion, complaint hotline and specific environmental protection measures;

② The construction contractors should post a Notice of Project Commencement around the construction site 7 days before the scheduled date of project commencement to disclose information including project overview, construction plan, names of respective construction units and name of project responsible person, complaint hotline, etc.;

③ Night construction should be restricted. When night construction is inevitable under special circumstances, actions should be taken to control the impacts of night construction on the surrounding environment and a prior notice should be given to the local residents to seek their understanding;

④ The construction contractors should post notices around the project sites and the premises of affected residents and enterprises to notify the public of pending interruption of services (including water supply, electricity supply, telecommunication and traffic, etc.) 5 days in advance.

(6) Prevention of Accidents and Risks

The construction contractors should develop an accident prevention plan and assign an emergency responsible person and seek aids from the concerned authorities immediately upon the occurrence of any accidents;

(7) Personal Safety and Health

The construction sites should be separated and fenced up and traffic signs and guardrails provided to assure pedestrian safety; safety training should be provided to the construction workers before construction commences; personal protection devices must be provided and mandatorily used; all construction activities should be suspended in case of a rainstorm or any emergency accidents;

(8) Prohibited Activities

Unapproved tree felling outside the approved construction site is prohibited; use of unapproved toxic substances, including lead paint, asbestos, open flame and alcohol, is prohibited.

7.1.2 Ambient air quality management

7.1.2.1 Ambient air impact analysis

Exhaust gas pollution in the construction period of the Project mainly comes from construction dust, tail gas of construction plants and exhaust gas of organic solvent used in decoration works.

1) Impact analysis of construction dust

In the construction period, dust produces the greatest impact on ambient air quality. Dust can easily arise from loose soil on the ground surface damaged by earthwork excavation and fill and other construction activities in the land use area during construction. Spoil transportation and removal, building material transportation, handling and stockpiling operations may also easily lead to dust. The local climate featuring in little rainfall and dry and windy springs and winters in Gansu Province constitute a driving force of dust generation. Dust easily rises in windy weathers and produces serious impacts on air quality. The amount of dust generated in the construction period is related to many factors, such as wind power, material moisture, operational civilization, stacking and stockpiling methods and particle size and sedimentation velocity of dust particles. The amount of dust generated when construction transportation vehicles travel is related to pavement condition and vehicle speed. Dust generated by vehicles under the action of natural wind normally has an impact range of 100m and can be reduced by around 70% if water is sprayed 4 or 5 times a day over the pavement. Impacts of construction dust can be effectively reduced by means of erecting fencing walls, more frequent water spraying on site roads, reasonable stockpiling of spoil and improved construction management in the construction process. The adverse impacts disappear as the construction period comes to an end.

2) Tail Gas of Construction Plants and Transportation Vehicles

Exhaust gas in the construction period mainly includes exhaust gas emitted by construction plants and tail gas from vehicles and the key pollutants are NO_x, CO and THC. The project area has excellent diffusion conditions and, as the exhaust gas from the construction plants is of a small volume and has a limited scope of impacts, its environmental impacts can be effectively reduced through improving maintenance of the construction plants and minimizing emission due to mechanical failures.

3) Impact Analysis of Organic Solvent

Organic exhaust gas generated by decoration materials such as paints, latex paints, spray agents and binding agents include formaldehyde, dimethylbenzene and chlorinated hydrocarbons. In the decoration process, it is difficult to estimate the quantities of decoration materials used. It is usually difficult for indoor air to comply with the requirements of the Indoor

Air Quality Standard (GB/T18883-2002) immediately after the decoration work is completed. Vitalization of the aforesaid organic exhaust gases mainly occurs in the 3-month decoration period. These organic exhaust gases belong to fugitive emission mainly affecting human health and may be effectively reduced indoors through selection of environment-friendly decoration materials and improvement of indoor ventilation.

7.1.2.2 Ambient air management measures

(1) Dust pollution control

The key sources of construction dust include dust brought by vehicles travelling on construction sites, dust generated by construction and decoration materials and earthwork stockpiling, dust generated in the transportation process of earthwork, debris and construction solid wastes and dust generated in mortar mixing operation.

Regarding the aforesaid dust pollution sources, the following dust pollution control measures are proposed:

1) First of all, to manage the construction activities on site, a construction site environmental protection responsibility system should be set up, with the Project Manager as the primary responsible person, and environmental protection measures and special program for construction dust control must be included in the construction organization design, which should not be put into implementation until approved by the competent authority.

2) Dust screens and fences should be set up for the building structures according to the respective specification to reduce the possibility of construction dust;

3) Ground surface of the construction sites and traffic roads should be hardened and sprayed with water for dust suppression;

4) Vehicle washing equipment should be installed at entrances and exits of construction sites to make sure all transportation vehicles are washed and cleaned and dust and dirt are removed before leaving site to keep the access roads and the surrounding area in a clean condition;

5) Proper covering or other effective dust prevention measures should be implemented on construction sites where construction solid wastes cannot be removed in time by the required deadline;

6) Slurry tanks and slurry troughs should be provided on construction sites involving slurry operation to prevent slurry spillage. Waste slurry should be transported out of site in closed tankers;

7) Pre-mixed concrete and pre-mixed mortar should be used on construction sites

according to the respective requirements and in-situ open-air mixing is prohibited;

8) During earthwork excavation and backfill operations, water should be sprayed for dust suppression and to reduce the duration of dusty operation; in case of winds above Grade 4, no earthwork construction and demolition operations should be implemented;

9) Construction materials, sand and gravel, soil and other dust-generating materials stockpiled on site should be covered with dust screen or cloth and dust suppression agent or water should be sprayed on a periodical basis to prevent wind erosion and dust generation;

10) Bulk materials, construction solid wastes and debris conveyed on and over buildings and structures should be put in closed containers and tossing and throwing from high altitude is prohibited.

11) Dense dust screen or cloth with excellent dust suppression effect should be installed outside the scaffolds during building construction and dust prevention measures such as water spraying, mist spraying should be taken during building demolition.

12) Vehicles transporting construction solid wastes and debris should be washed and cleaned in time to make sure that they are clean when leaving the sites; transportation vehicles should be properly covered to achieve air-tight transportation and prevent possible spillage and leakage on roads.

13) Construction sites should be 100% fenced up; material stockpiles 100% covered; vehicles 100% washed; construction site surface 100% hardened; demolition sites 100% adopting wet operation method and debris transportation vehicles 100% achieving air-tight transportation.

(2) Vehicle Tail Gas

1) Construction plants and vehicles in good operating condition should be selected;

2) Fuel-driven construction plants and vehicles must be operated in normal condition to assure compliant tail gas emission;

3) Equipment should be used in a reasonable way and equipment maintenance and repair should be strengthened.

(3) Decoration Exhaust Gas

1) Environment-friendly decoration materials should be selected;

2) Doors and windows should be opened after the decoration work is completed for effective ventilation.

3) Indoor air quality monitoring should be conducted before the school buildings are put

into service to assure that they are not occupied until full compliance is achieved.

7.1.3 Sound environment quality management

7.1.3.1 Sound environment impact analysis

Noises in the construction period mainly comprise of noise of construction plants, noise of construction operation and noise of construction vehicles. The construction period of the Project is divided into four stages, i.e. the earthwork construction stage, the foundation construction stage, the structure construction stage and the decoration stage.

The key noise sources in the earthwork construction stage are bulldozers, excavators, loaders and transportation vehicles while those in the foundation construction stage are compactors, cranes and graders. Cutters are the main noise-generating equipment in the structure construction stage. Since most of the construction activities in the decoration stage are carried out inside the buildings and the construction noise is reduced to a certain extent by the walls, noise impacts produced in this part of the construction process are insignificant.

7.1.2.2 Sound environment management measures

1) Reasonable planning of construction sites

The number of construction plants mobilized on site should be minimized provided that the constructional need is satisfied. Steel rebar and steel sheet processing should be outsourced, if possible, to reduce noise source from on-site processing; the implementation agency should develop a comprehensive plan to arrange the noise sources at a centralized location where possible to reduce the scope of construction noise impacts.

2) Assuring normal operation of construction plants

State-of-the-art low-noise equipment should be selected if possible; high-noise equipment should be used at lower frequency and low-noise pneumatic or spiral pile drivers should be used for pile driving; high-efficiency silencers should be installed on loaders, excavators and other mobile noise sources and honking should be banned on construction sites to avoid and reduce noise disturbance. The construction contractors should conduct periodical inspection and maintenance of the construction plants in the construction process to assure normal operation and avoid high-intensity noises generated from operation of defective equipment.

High-noise mechanical equipment should be located away from the side adjacent to residential areas and noise-reduction fences should be set up on construction sites located in a distance of less than 5m from residence, hospital and school buildings.

3) Reasonable scheduling of construction time

① The construction time should be reasonably scheduled to have high-noise construction

periods (e.g. foundation construction) arranged in winter or summer holidays if possible. Otherwise, the construction activities should at least be coordinated with the teaching activities to, e.g. have high-noise construction activities arranged in afternoons or weekends to avoid operation of high-noise equipment in time periods for concentrated teaching and student rest.

② The construction sequence should be reasonably arranged and no construction should occur in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day.

③ When continuous construction is needed, a request should be submitted to the local environmental protection authority. Night construction must not be implemented without prior approval and without the acknowledgement by schools and residents in the neighborhood. High-noise equipment should be arranged for daytime construction and the standards specified in Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011) should be strictly enforced.

(4) Construction Vehicle Noise Control Measures

① Stronger efforts should be made in transportation management. The implementation agency and the construction contractors should negotiate on environmental protection education for transportation workers. The speed of transportation vehicles should be controlled and overloading banned.

② Vehicle maintenance and repair should be strengthened to assure normal operation;

③ Direction boards should be provided at entrances and exits of construction sites and unnecessary idle speed, braking, ignition and honking should be avoided.

④ Transportation vehicles are banned to travel in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day to assure normal resting of local residents.

⑤ Traffic noise may generate certain impacts on sound environment sensitive points in the neighborhood. Therefore, the construction contractors should promote the environmental protection awareness of the construction workers, learn about the local customs and habits and reasonably arrange transportation time. In centralized residential areas and other environmentally sensitive areas, speed limit, horn prohibition and other self-conscious actions should be taken to control vehicles and other construction plants so as to prevent and reduce noise impacts.

⑥ Transportation vehicles should travel in low speed on campus to not only reduce impacts by traffic noise on teaching activities, but also protect personal safety on campus. Vehicles traveling on campus should strictly follow the planned route. Random parking and

honking are prohibited.

(5) Decoration Noise Control Measures

When it is unlikely to implement the decoration works in a centralized time period, management of decoration noise should be strengthened and strict decoration management measures should be developed to minimize impacts caused by decoration noises. Doors and windows should be properly closed while decoration work is going on. The decoration time period should be limited and no decoration activity of any kind should be conducted in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day.

7.1.4 Surface water environment quality management

7.1.4.1 Surface water environment impact analysis

Wastewater in the construction period mainly comprises of construction wastewater and domestic sewage. Construction wastewater mainly includes wastewater from vehicle cleaning and washing, construction site washing, construction material washing, concrete curing and aggregate washing. Although insignificant in volume, such wastewater contains oil and mud and, if discharged randomly without proper treatment, will cause pollution of soil and surface water and ground water to a certain extent and, in particular, even bigger impact on surface water environment in rain weather.

Domestic sewage mainly comes from daily life activities of construction workers and the key pollutants are COD_{Cr}, BOD₅ and SS with a generation concentration of 400mg/L, 200mg/L and 220mg/L respectively. In addition, ground water that might flow out of ground in the course of piling, foundation and building construction and natural precipitation flowing over the construction sites, if not properly treated, will generate significant impacts on the surface water environment of the project area.

7.1.4.2 Surface water environment management measures

(1) Stormwater Management

1) A sound stormwater and drainage system is already in place in each project school. During construction, the stormwater collection gutters must be kept unblocked and no construction materials should be stockpiled over and adjacent to the stormwater collection gutters to avoid possible obstruction.

2) Soil contaminated (e.g. by oil, grease or paints) in the construction period should be removed in time to prevent massive contamination of stormwater.

3) The construction contractors are encouraged to use weather forecast and rainstorm

warning functions to respond to any upcoming adverse rainfall conditions.

4) During rainfalls, timely attention should be paid to make sure that the stormwater collection gutters and drainage pipelines remain unblocked and any obstructions are removed in time.

(2) Construction Wastewater

1) Wastewater from vehicle cleaning and washing, construction material washing, concrete curing and aggregate washing on construction sites should be collected via the gutters and then mixed and diluted to reduce wastewater pH value before such wastewater enters the temporary sedimentation tank for treatment. The temporary sedimentation tank should have an adequate size to guarantee 12-hour wastewater retention as specified in the standard and the treated wastewater should be fully reused in construction site cleaning, construction material washing, concrete curing and aggregates re-washing;

2) Muddy stormwater and slurry water should be collected into the sedimentation tank for sedimentation and reuse;

3) Machine oil leaked from machinery and wastewater from equipment and material washing should be settled in oil separating tank before reuse to control impacts from sediments and suspended substances contained in the construction wastewater on the surrounding environment;

4) The oil separating tanks and sedimentation tanks should be subject to proper anti-seepage treatment to avoid possible impacts on the surrounding environment.

5) Oil or water leaks must be inspected and repaired before any mechanical equipment is used.

(3) Domestic sewage

1) Temporary toilets, septic tanks and wastewater collection tanks should be provided on construction sites. Laundry and kitchen wastewater generated by the construction workers should be subject to oil separation and sedimentation before discharged into the school sewage pipelines. Night soil generated in the temporary toilets should be stored in septic tanks temporarily before removed by the local environmental sanitation authority on a periodical basis.

2) In order to prevent possible pollution of ground water, anti-seepage cement should be used in the foundation construction of the wastewater collection tanks.

3) Environmental protection education for construction workers should be strengthened

to promote environmental awareness and prevent uncontrolled littering and wastewater discharge.

7.1.5 Solid waste management

7.1.5.1 Solid waste impact analysis

Solid wastes in the construction period mainly include construction solid wastes generated in the construction process and spoil (debris) generated from foundation excavation and backfill as well as domestic solid wastes generated by the construction workers. Construction solid wastes refer to any substances generated and discarded in the construction and demolition activities and consist of complicated components, mainly including waste sand and aggregates, bricks and tiles, timber, waste ceramic tiles, plastics, waste concrete, waste metal and packaging materials. Domestic solid wastes mainly include plastics and waste paper. Construction solid wastes generated in the construction period will not only affect site view if not properly treated, but will also generate dust in windy and dry weathers; domestic solid wastes generated by the construction workers, if not treated in time, will generate mosquitoes and pests and odor when the temperature condition is suitable and spread diseases and result in adverse impacts on the surrounding environment.

7.1.5.2 Solid waste management measures

1) Construction Solid Wastes

① Construction solid wastes generated in the construction period should be removed in time to avoid secondary pollution in the process of stockpiling.

② Some package bags generated in the construction process need to be classified and stockpiled, with the reusable parts adequately recycled and the other parts incorporated into and treated together with domestic solid wastes.

③ Earthwork construction should be carefully designed and organized to achieve substantial earthwork excavation and fill balance and avoid long haulage; waste concrete and bricks discarded on site should be removed in time.

④ Solid wastes should be subject to classified treatment. Reusable construction solid wastes, such as steel rebar, should be recycled to avoid waste of resources while the non-reusable construction solid wastes need to be dumped at designated sites.

⑤ Vehicles transporting bulk materials and wastes should be properly sealed, fastened and covered to avoid spillage on the way; vehicles transporting soil should travel along designated

route in the specified time period. Spoil disposal should be conducted in a concentrated period and avoid storm season and be accompanied with simultaneous compacting.

⑥ Vehicles transporting construction solid wastes and debris should be washed and cleaned in time to make sure that they leave the sites clean and tidy; transportation vehicles should be properly covered to achieve air-tight transportation and prevent possible spillage and leakage on roads.

⑦ Vehicle washing equipment should be installed at the entrances and exits of construction sites to make sure all transportation vehicles are washed and cleaned and dust and dirt removed before leaving site to keep the access roads and the surrounding area in a clean condition;

⑧ The project schools should strictly abide by the requirements of local authorities on treatment of construction solid wastes.

2) Domestic solid wastes

The construction contractors should properly carry out the collection and stockpiling of domestic solid wastes and remove the domestic solid wastes out of the construction sites in a timely manner. Education to the construction workers should be strengthened and civilized construction should be promoted to put an end to uncontrolled dumping of domestic solid wastes and assure the environmental quality on construction sites and the surrounding areas. Closable classified garbage bins should be provided in the temporary living areas and the domestic solid wastes should be collected and transported on a daily basis to the adjacent garbage collection stations and then by the environmental sanitation authority to municipal domestic solid wastes landfills for hygienic landfill.

(3) Management Requirements for Waste Paint Buckets

During the decoration of school buildings, paint will be used to varying degrees, and all construction units will face the problem of temporary storage and disposal of waste paint buckets generated after the paint is used up.

According to the *National Hazardous Waste List* (2021), used-up waste paint buckets fall under the category of "Non-specific Industries" in "HW12 dyestuff and paint wastes" and "900-252-12 paint (excluding water-based paint), organic solvents for painting, the waste generated in the process of painting". According to the storage requirements of hazardous wastes in the *Technical Specifications for Collection, Storage and Transportation of Hazardous Waste* (HJ 2025-2012), the temporary storage sites of waste paint buckets generated during decoration fall under the category of "Facilities Used for Temporary Storage by Hazardous Waste Generating

Units". Therefore, waste paint buckets need to be stored separately. According to the requirements of the Pollution Control Standard for Hazardous Waste Storage (GB 18597-2001, 2013 Amendment), the temporary storage site of waste paint buckets is forbidden to be close to the protection area prone to kindling and high voltage electricity. Warning signs should be set up in the storage site and rainproof, fire prevention and seepage prevention measures should be taken. The temporary storage site should be equipped with lighting and fire fighting facilities. At the same time, the construction unit should establish a collection, transfer and storage ledger to record the whole process from the generation, collection and temporary storage of waste paint buckets until they are delivered to the manufacturer for recycling. See Table 5-5 and Table 5-7 for detailed record tables.

Therefore, the construction units of all project schools should give priority to water-based paint. If non-water-based paint is required, the waste paint buckets should be managed in strict accordance with the "Management Requirements for Waste Paint Buckets" in this report.

7.1.6 Ecological impact management

7.1.6.1 Ecological impact analysis

Site excavation in the construction process will result in a certain area of disturbed surface and relatively significant damages to the existing native land, further leading to increase of fragmentation, change of soil particle size and aggravation of soil erosion.

Impacts on vegetation caused by construction works are mainly reflected in the damages to surface vegetation in the operation area from activities of surface excavation, transportation and stockpiling of construction materials and production equipment as well as rolling of construction plant and vehicles and trampling by the construction workers.

7.1.6.2 Ecological impact management measures

(1) Ecological Resource Protection and Management Measures

① Construction site layout and arrangement should be reasonable and optimized to minimize the scope of construction activities and land damages caused during project implementation;

② Bricks, stone, sand, cement, timber among other construction materials needed and outsourced for the construction works should be transported to the construction site at time intervals and in loads roughly matching the actual demand on site to minimize land area occupied by material stockpiles; upon completion of the construction works, residual materials should be removed out of site in time to enable landscaping of construction sites;

③ Temporary protective fences should be erected around trees remaining on the construction site before the construction works commence based on the results of construction site investigation;

④ Neither should the trees be attached with marks and labels other than the identification label nor should the tree protection zones have construction materials stockpiled or stored and construction plants and equipment parked in their immediate adjacency;

⑤ Temporary intercepting ditches should be constructed on construction sites and floodways should be built to replace surface runoff passage damaged by the Project to divert rain season flood and prevent the construction works from erosion by surface runoffs;

⑥ On the premise that construction quality is assured, the construction contractors should take all possible actions to shorten the time of temporary land occupation, control the construction time of earthwork and maintain stable cut and filled slope to minimize impacts outside the scope of the construction works.

(2) Soil Erosion Control Measures

1) Engineering Measures

① Leveling and backfill: including measurement of backfill area and depth, backfill bulk density and rolling bulk density, determination of backfill rolling method, determination of forecast and protection measures of possible subsidence and its hazards;

② Planning of transportation routes of backfill material and top soil;

③ Depression backfill and utilization: waste soil and ballasts should be adequately utilized for depression backfill so that the depressions are properly backfilled and leveled and waste materials are used up. Terrain, construction conditions and area among other factors should be considered upon determining backfill method. Normally, manual backfill and mechanical backfill are integrated and used simultaneously, with bulldozers used to level off large depressions in rectangular partitions and manual methods used to handle small depressions, corners and edges that are not accessible for mechanical operation;

④ Upon rough leveling, the key backfill positions should be identified first based on the terrain and topographical features and the backfill height of the project area. Then, bulldozers or other construction plants are used to move the fill materials to the depression backfill zone. During backfill operation, the fine and particulate sand and gravel materials should be placed on bottom layers while aggregates of larger particle sizes on the top before rolling and

compacting. After rough leveling is over, shovels and spaces should be used to manually handle and level off the disturbed edges and corners of the construction zones and small depressions left over from mechanical leveling until the final leveling effect required in the design document is achieved.

2) Temporary Measures

Since the civil works of each project school are of a large scale, it is necessary to stockpile the sand and aggregates needed for building foundation excavation, backfill and construction works for a long time. In order to avoid wind and water erosion, it is necessary to have the stockpiles temporarily covered and protected. Such temporary covering and protection measures include temporary covering with dust screen, water spraying, etc.

① Covering

Temporary covering measures should be taken to prevent the exposed parts of the temporary stockpiles from wind and water erosion. Dense dust screen may be selected as the covering material. Dust screen should not be removed until the earthwork backfill commences and should be rolled up backward from the ground pit position and fully removed and recovered after the backfill operation is completed.

② Water spraying

1 or 2 passes of water spraying should be conducted on the leveled construction sites. When the water infiltration depth reaches about 2cm, a surface crust with an effective wind erosion resistance thickness will be formed to facilitate restoration of water and soil conservation function.

3) Vegetation Measures

Native species should be selected for vegetation restoration on construction sites and spoil disposal areas upon the completion of the construction works. Introduction of alien species should be avoided.

7.1.7 Social impact mitigation measures

1) The implementation agency should develop construction worker management methods with the specific circumstances of the project schools taken into account and submit such methods to the project schools for review. The construction workers should not enter the school buildings without prior approval and should not cause interferences and disturbances to normal teaching activities;

2) The “Environmental Codes of Practices on Safety and Health” for construction workers must be strictly followed to not only safeguard the health and safety of construction workers, but also prevent introduction of infectious and epidemic diseases into the campuses;

3) A stable and transparent communication channel should be established by GDoE, Gansu Provincial PMO and the project school management to address the various problems encountered in the operation period of the Project.

4) It is recommended that the PMO opens commuting bus lines between LND TVET Park and Lanzhou Urban Center and develops reasonable bus routes, stops and time table to reduce waiting time and allow easy commuting for teachers and provide preferential fare to students.

5) Regarding the potential grievances from some teachers of the 2 merged schools, in addition to active efforts in promoting the Project, the respective project schools should set up a sound communication mechanism and a grievance redress mechanism and create a comfortable working and living environment for the teachers so as to enable them to get free from family worries and concentrate on teaching activities ;

6) As a part of the competence building activities under the Project, specific contents should be designed for teachers pending transformation to promote their competence and help them adapt themselves to the new specialties at the fastest possible speed. Regarding students pending specialty adjustment, the concerned project schools should adjust the affected students to new specialties based on market demand and free will of students, and, if necessary, provide them with psychological counseling.

7) It is recommended that the project schools provide more part-time jobs for poverty-stricken students.

8) It is recommended that the schools take advantage of their geographical location and establish off-campus practice and practical training bases to provide not only training but also more opportunities of employment for the students.

9) It is recommended that the LND government authorities continue improving the pension insurance and unemployment insurance policies and consult the LND enterprises or institutions on providing preferential policies and safeguards for local land-depleted farmers to get long-term and stable jobs. The project schools can also provide employment opportunities during the implementation of the Project to local land-depleted farmers, in particular, women, poor households and disabled individuals. In addition, stronger efforts should be made in training for land-depleted farmers to increase their employment rate.

7.1.8 Environmental Codes of Practices on Cultural Relics Protection

In the construction period, procedures for handling tangible cultural heritage should be implemented. Upon any discovery or suspected discovery of any cultural relics, the construction contractors should immediately have the site protected and report the local cultural relics bureau for further actions following the requirements of the Law of the People's Republic of China on Cultural Relics Protection (Dec. 29, 2007) and the World Bank's policies on tangible cultural resources and should not resume construction until further actions are implemented by the Cultural Relics Bureau. See Figure 7-1 for the reporting procedure of cultural heritages.

Upon the discovery or suspected discovery of any cultural relics in the construction process, the construction contractors should:

- 1) immediately suspend the work at the construction site where such cultural relics are discovered and reinforce site protection;
- 2) immediately report the police and cultural relics administration for verification and further actions;
- 3) immediately have the protection area determined once the cultural relics discovered are verified by experts;
- 4) carry out rescue excavation of the cultural relics in case of urgent construction progress or risks of natural damages;
- 5) Rescue excavation of cultural relics should be carried out by professionals using professional equipment and should not be conducted by the contractors on their own;
- 6) The cultural relics authority needs to determine the level of protection of the respective cultural relics. If the respective cultural relics are determined as county level, corresponding protection measures should be taken and the construction contractor should not resume the construction until an instruction to resume construction is received from the Cultural Relics Bureau; if the respective cultural relics are determined as provincial or national level, a report needs to be submitted to the State Cultural Relics Bureau and corresponding protection measures should be taken and the construction contractor should not resume the construction until an instruction is received from the Cultural Relics Bureau.
- 7) If the discovery is deemed as a significant cultural relics discovery, the Project will need to go through the process of re-siting justification.

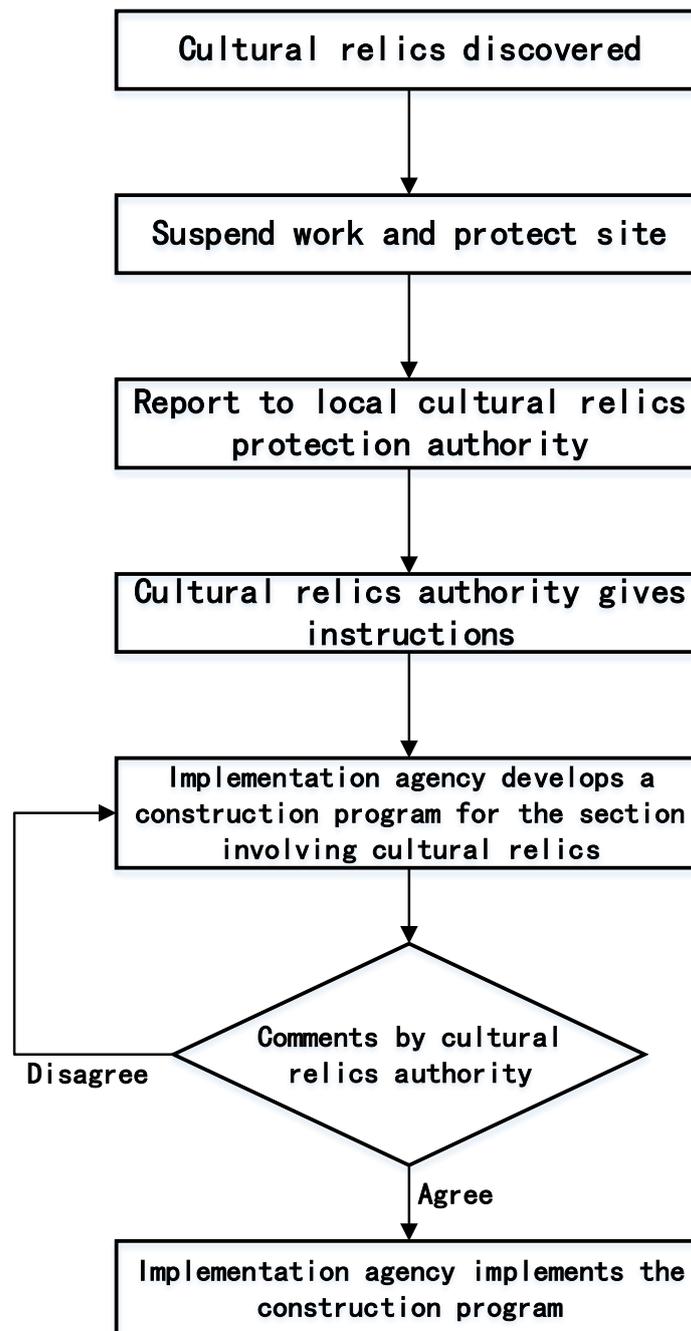


Figure 7-1 Flowchart for Handling Cultural Relics Discovered in the Construction Period

7.1.9 Environmental Codes of Practices on Safety & Health

1) Constructional safety and health analysis

The construction contractors and the supervisory agency are responsible for taking all reasonable measures to safeguard the life safety of workers, school faculty and students as well as the safety of surrounding buildings and prevent them from unexpected damages caused by

construction activities. The enterprises should engage a contractor that is competent in managing the occupational health and safety issues of its employees and make sure the contractor also executes the enterprise's hazard management rules through a formal procurement agreement. Construction safety and health under the Project includes design and operation of ordinary facilities, communication and training, human body hazards and monitoring.

2) Constructional safety and health measures

The construction contractors are responsible for following the World Bank EHS Guidelines and all the national and local safety requirements and implementing other accident prevention measures to assure the safety and health of construction workers.

① All the buildings on construction sites should be kept in good integrity; the temporary buildings and structures should be structurally safe and reliable to resist impacts of local bad weathers and have appropriate sunlight and proper facilities for partial isolation of dust and noises; the floors should be kept level, flat and skip-resistant.

② The construction contractors should assure availability of first aid complying with the respective standard. Appropriate first aid toolkits should be provided on construction sites; a written emergency response procedure should be available and cover the full process till the patients are finally transferred to an appropriate medical institution.

③ Occupational health and safety training should be provided to all new construction workers to introduce to them the basic working rules and personal protection rules on construction sites and teach them how to prevent injuries to other workers; the training contents should include basic knowledge of hazards and dangers, specific hazards present in work places, codes of safe operation, fire emergency response procedures, evacuation procedures and natural disaster response procedures (the final contents will be determined based on actual needs). The training should include detailed introduction of specific hazards and their color codes in work places.

④ Correct signs should be provided in hazardous areas (e.g. power distribution rooms, etc.), devices, materials, safety measures and emergency exits and actions should be taken to prevent unauthorized access to such areas; the signs should conform to the international standards and be easy to understand for staff, visitors and general public (to be determined depending on actual circumstances).

⑤ If a worker holding a handheld or electrical tool feels vibrations on his/her hands and arms or a worker standing or sitting on a vibrating surface feels vibration in the whole body,

such vibration should be controlled through equipment selection, installation of vibration reduction gaskets or devices or limiting exposure time;

⑥ Appropriate personal protection devices should be determined and provided by the construction contractors to the construction workers to assure that the workers, their colleagues and occasional visitors are adequately protected and no unnecessary inconvenience is caused to the users;

⑦ Clamping hazards should be eliminated upon design of machinery and actions should be taken to prevent possible physical harms by the machinery projections in normal operation;

⑧ Warning signs should be installed on all live electrical devices and wires; all the electricity wires, cables and handheld electrical tools should be inspected to identify any damaged or exposed wires and the maximum allowable working voltage of handheld tools should be determined according to the manufacturer's recommendations; all electrical equipment used in humid (or possibly humid) environment should be equipped with double insulation / grounding; all electrical wires buried under the ground should be identified and marked before any digging operation commences.

⑨ Actions should be taken to prevent the construction workers from overexertion. Training should be provided to workers on how to correctly move and handle materials during construction and demolition activities, including specifying the upper limit of load a single operator can handle (and the requirement of mechanical aid or double operation beyond the upper limit) ; The layout plan of the construction site should be so developed to avoid, to the best possibility, needs for manual movement of heavy objects; tools should be so selected and work table so designed to reduce, to the best possibility, the level of force and the duration of handholding needed and facilitate the workers to keep the correct position (and, when necessary, use the users' and adjusted worktable).

⑩ Actions should be taken to prevent trip-over and fall-over. A sound site cleaning and management system should be implemented to, for example, classify the scattered building materials and demolished parts and place them in areas away from walkways, remove excessive wastes and spilled liquids on a periodical basis, place electrical wires and ropes in public areas and labeled corridors and use skid-resistance mats.

⑪ Safety protection requirements for high-altitude operation: Temporary fall protection measures should be taken, e.g. providing handrails and foot baffles around scaffolds and at the edges of other high-altitude operation areas to prevent fall of materials; training should be provided to the workers on actual operation of the fall prevention devices which are used during

operations of high altitude of or more than 2m from the ground or on occasions with the possibility of falling into machines in operation, water or other liquids or hazardous substances or falling from an opening on the working face; training should be provided to the workers on actual operation of personal fall prevention equipment, e.g. full-body harness and buffering lanyard capable of carrying a load of 5000lb; rescue procedures should be developed to rescue workers successfully prevented from falling. The connecting points of fall prevention equipment should also be able to carry a load of 5000lb; control zone and safety supervision system should be set up to warn the workers against the presence of a fall hazard zone in the adjacency and covers of openings on floors, ceilings and walkway pavements should be reinforced, marked and indicated.

⑫ Safety protection requirements on preventing hit by objects: Solid wastes should be discarded and discharged at designated and restricted areas. Wastes should be conveyed safely through the chutes from upper floors to lower floors; appropriate protective devices and fastening methods should be used during sawing, cutting, welding, grinding, polishing, chiseling and carving operations; passages and corridors should be kept unblocked and actions should be taken to avoid heavy-duty machinery travelling on scattered wastes; temporary fall protection measures should be taken, e.g. providing handrails and foot baffles around scaffolds and at the edges of other high-altitude operation areas to prevent fall of materials; appropriate personal protection devices (e.g. safety glasses with protective edges, masks, safety helmets and safety boots) should be used.

⑬ Safety protection requirements for moving machinery: The vehicle travelling, machinery operation and personnel walking areas should be planned and zoned; one-way traffic rules should be adopted to control vehicle traffic; speed limit should be stipulated; and on-site traffic should be guided by trained signalmen (wearing obvious vests or jackets); Personnel working or walking in the operation zones of heavy-duty machinery should wear visible vests to increase visibility and training should be provided to teach workers how to have eye contacts with equipment operators before approaching a vehicle in operation; it should be assured that back-up buzzers are installed on moving equipment; hoisting equipment (e.g. cranes) should be properly inspected, maintained and confirmed suitable to move on road before they are used to lift heavy objects up to a higher working level for fastening.

⑭ Dust protection requirements: All dust removal methods, e.g. water spraying or non-toxic chemical agents, should be used to reduce dust raised by vehicles; where excessive amount of dust is present, personal protection devices (e.g. dust masks) should be used.

⑮ The construction contractors should develop procedures and systems for reporting and

recording the following contents: occupational accidents and diseases, hazardous circumstances and accidents. Such systems should enable the construction workers to immediately report to their own direct superintendent any circumstances causing serious hazards to life and health. When the construction workers are caught in any occupational injuries and risks, suspicious occupational diseases, dangerous situations and accidents, an immediate report should be submitted to the top management; the top management should investigate into all reported occupational accidents, occupational diseases, risks and incidents, during which assistance should be sought from professionals with knowledge and competences of occupational safety.

⑯ Health education should be provided to the construction workers, e.g. execution of information communication strategy, strengthening face-to-face consultation, addressing systematic problems affecting individual behavior, encouraging use of personal protection devices, avoiding spread of disease to others, etc. In addition, the construction workers should be encouraged to use mosquito repellent, clothing and mosquito nets and other blocking methods to avoid spread of diseases from mosquito bites.

⑰ Health examinations should be organized for construction workers to prevent the spread of infectious and epidemic diseases.

7.1.10 Suggestions on Camp Layout and Construction Route Management

(1) When each project school is signing a contract with the construction contractor, the contract contents should include but not limited to the following:

① Sort out the environmental protection measures in the EMP Report and incorporate the environmental protection measures into the contract;

② The contract should specify whether the school allows the contractor to set up living camps, kitchens, toilets, office camps, material processing plants and other sites within the scope of the school construction site, and specify the corresponding solutions and environmental protection requirements, which should be strictly implemented after the construction team enters. It is recommended that contractors arrange accommodation and meals for construction personnel by renting private houses. Under restrictions by conditions, if living areas must be set up on campus, the contractors must be required to manage domestic wastewater, domestic garbage and kitchen waste, and make clear relevant terms and conditions, so as not to pollute the campus environment;

③ The contract should specify the requirements for the layout of the construction site, requirements for the construction driving route, requirements for traffic organization and management, and requirements for the management of camps and personnel;

④ The contract should explicitly require the contractors to provide medical first aid kits, which should contain commonly used drugs and that contractors should provide relevant medical supplies such as disinfection, hemostasis and bandaging required for emergency treatment of minor injuries;

⑤ The contract should explicitly require the contractors to strictly implement the relevant policies and regulations of the World Bank on epidemic prevention and control.

(2) When the general layout design of the construction is carried out at the construction drawing phase of the Project, the design unit should communicate with the school and the EIA unit in a timely manner, and verify the feasibility of the layout scheme of the construction camps in all aspects. The Project should not be commenced until it meets the World Bank's requirements for environmental protection.

7.2 Environmental impacts and mitigation measures for specific sites in the construction period

7.2.1 Gansu Vocational College of Energy and Chemical

(1) Environmental impact analysis

① Construction of Student Canteen No. 30 will mainly affect the Logistics Building with a maximum construction noise of approximately 62.5dB(A) and exceeding the standard by 2.5dB(A) in daytime. The construction site is located approximately 75m away from the Logistics Building, which is mainly occupied by logistics workers and subject to significant impacts from noises in the construction period mainly in the foundation construction period. The side facing the construction site is subject to greater impact and involves approximately 30 affected persons.

② Construction of Student Dormitory No. 31 and 32 will mainly affect Dormitory Building No. 4 and 5 with a construction noise of approximately 66.02dB(A) and exceeding the standard by 6.02dB(A) in daytime. The student dormitory buildings are densely populated and have a shortest distance of approximately 50m from the construction site, thus subject to significant impacts from construction noise, in particular during noon and night resting hours. Therefore, the construction time must be reasonably scheduled to avoid significant impacts on the students in rest periods.

③ Construction of Practical Training Building No. 4 will mainly affect Building No. 3 and 19 with a construction noise of approximately 70.46dB(A) and exceeding the standard by 10.46dB(A) in daytime. The construction sites are very close to the two buildings, with the

shortest distance being only 30m. Construction noise produces significant impacts on the teaching activities, involving approximately 100 affected persons.

④ Construction sites No. 30, No. 31 and No. 32 are located at the northeastern corner of the campus, a living quarter in the school. If not properly managed, construction vehicles and uncontrolled stockpiling of construction materials will bring safety hazards to students on campus.

⑤ In addition, this area is relatively densely populated, in particular in the morning, noon and evening peak hours when students are on the way going to or coming back from classes. Therefore, the three construction sites must be reasonably planned and special personnel must be assigned to guide and manage pedestrians on the road.

⑥ Building No. 4 is located in the southeastern corner of the school, as a part of the teaching zone. The construction site should be selected in concert with Building No. 24 and the construction areas should be isolated to prevent safety hazards brought by traffic on students and teachers on their way to and back from classrooms.

⑦ The construction of Dormitory Building No. 33 mainly affects Dormitory Buildings No. 5, No. 31 and No. 32. The construction noise is about 69.1 dB (A), which exceeds the standard by 9.1 dB (A) in the daytime. The distance between the construction site and each of the three dormitory buildings is equivalent, about 35m. The noise during the construction has a great influence, and is mainly from the foundation construction.

⑧ The construction site of Dormitory Building No.33 is located in the northeast corner of the school, and the construction site is located in the living area. If not properly managed, construction vehicles and uncontrolled stockpiling of construction materials will bring safety hazards to students on campus. In addition, this area is relatively densely populated, in particular in the morning, noon and evening peak hours when students are on the way to school or coming back from classes. Therefore, the construction site must be reasonably planned and special personnel must be assigned to guide and manage pedestrians on the road. The construction area should be isolated to avoid any potential safety hazards to teachers and students brought by vehicles.

(2) Mitigation measures

① One centralized construction camp should be set up at the northeastern corner of the campus used for construction of Buildings No. 30, 31, 32 and 33 . The construction camp and the three construction sites should be separated from the surrounding dormitory buildings with closeable fences. Another centralized construction camp should be set up in an unoccupied area

in the middle east of the campus for construction of Building No. 4 and No. 24. A fully closed management system will be adopted for the construction sites.

② Special personnel should be assigned to carry out tour inspections around the construction area. Construction workers should not be allowed to enter the student dormitory buildings and practical training buildings without due authorization while non-constructional personnel should not be allowed to enter the construction area without due authorization.

③ Stronger efforts should be made in inspection in the construction sites around student dormitories, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites.

④ Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours.

⑤ Low-noise pneumatic or spiral pile drivers should be used.

⑥ The construction site of Practical Training Building No. 4 is located very close to Practical Training Building No. 3 and the noise standard is exceeded by 10.46dB(A). In order to assure effective noise reduction, sound insulation retaining walls (with a noise reduction of 6-10dB(A)) should be provided around the construction site and sound insulation windows should be installed to avoid impacts from construction noise and assure that the sound environment in the Practical Training Building complies with the standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the western and northern sides of the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction.

⑦ Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization.

⑧ Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety.

⑨ No honking is allowed when construction vehicles travel on campus.

⑩ Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road

⑪ Temporary toilets and septic tanks should be provided in construction camps and night soil should be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment.

⑫ The construction contractors should remove and transport the construction solid

wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District.

⑬ Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou New District.

⑭ It is required to strictly implement mitigation measures for sensitive protection targets and traffic safety protection regulations.

⑮ It is required to strictly implement World Bank's policies on COVID-19 prevention and control.

7.2.2 Gansu Finance and Trade Vocational College

(1) Environmental impacts

① Construction of Area AB of Building No. 22 mainly affects Dormitory Building No. 2. The construction noise is 63.74dB(A) and exceeds the standard by 3.74dB(A) in daytime. The student dormitory buildings are densely populated and have a shortest distance of approximately 65m from the construction site, thus subject to significant impacts from construction noise, in particular during noon and night resting hours. Therefore, the construction time must be reasonably scheduled to avoid significant impacts on the students in rest periods. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying.

② The construction site of Area AB of Building No. 22 is located close to the living quarters. If not properly managed, construction vehicles and uncontrolled stockpiling of construction materials will bring safety hazards to students on campus. In addition, this area is relatively densely populated, in particular in the morning, noon and evening peak hours when students are on the way to school or coming back from classes. Therefore, the three construction sites must be reasonably planned and special personnel must be assigned to guide and manage pedestrians on the road.

③ Construction of Building No. 21 mainly affects Teaching Building No. 14. The maximum construction noise is 62.50dB(A) and exceeds the standard by 2.5dB(A) in daytime. The construction site is relatively close to the teaching buildings, with a distance of approximately 75m and, thus produces significant impacts on teaching activities involving approximately 600 affected persons, mainly on the eastern part of the teaching building. Impacts by dust generated in the construction period on local pedestrians may be effectively mitigated through dust screens and timely water spraying.

④ The construction sites of Building No. 18, 19 and 21 are mainly located in teaching

areas and should be reasonably planned and located in concert with the position of Teaching Building No. 14. The construction areas should be isolated to prevent safety hazards brought by traffic on students and teachers on their way to and back from classrooms.

⑤ The construction of Area C of Dormitory Building No. 22 mainly affects Dormitory Building No. 2 and Area AB of Dormitory Building No. 22, of which Area B of Dormitory Building No. 22 is closer to the construction site, around 20m, recording the maximum construction noise of about 74.0 dB (A) and exceeding the standard by 14.0 dB (A) in daytime. Moreover, the north side of Area B of Dormitory Building No. 22 is facing the construction site and greatly affected by noise. Dormitory Building No. 2 is about 45m away from the construction site, and the maximum construction noise is about 66.9 dB (A), which exceeds the standard by 6.9 dB (A) in the daytime. After the window is closed, the noise decreases.

⑥ The construction of Area AB of Practical Training Building No. 20 mainly affects Practical Training Building No.19 and Second Teaching Building No.21, of which Practical Training Building No.19 is about 32m away from the construction site, recording a maximum noise of 69.9 dB (A), exceeding the standard by 9.9 dB (A) in the daytime. The building is mainly for teaching and practical training. Since Building No. 19 is not directly facing the construction site, the noise mainly concentrated in the foundation construction stage will have a slight impact on teaching activities. Building No. 21 is about 55m away from the construction site, with the maximum construction noise of 69.9 dB (A), exceeding the standard by 9.9 dB (A) in the daytime. The building is mainly for students' accommodation. Noises caused during the construction have a great influence and are mainly from the foundation construction. The side facing the construction site is subject to greater impact.

(2) Mitigation measures

① A centralized construction camp should be set up in the southeastern corner of the campus for construction of school buildings. Closeable fences are required to separate it from the construction area.

② The construction site in Area C of Dormitory Building No. 22 should be fenced up. A temporary gate should be opened on the east side of the site near the road for construction workers and vehicles to pass through under closed-off management. Anti-falling frames should be set up above the road on the west side of the site to prevent falling objects from harming people.

③ Special personnel should be assigned to carry out tour inspections around the construction area. Construction workers should not be allowed to enter the student dormitory

buildings and practical training buildings without due authorization while non-constructional personnel should not be allowed to enter the construction area without due authorization.

④ Stronger efforts should be made in inspection in the construction sites around student dormitories, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites.

⑤ Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours.

⑥ Low-noise pneumatic or spiral pile drivers should be used.

⑦ Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization.

⑧ Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety.

⑨ No honking is allowed when construction vehicles travel on campus.

⑩ Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road.

⑪ Due to campus environment restrictions, it is necessary to provide a special road on the construction site of Building No. 18 as a construction transportation access road connecting the East Gate. Therefore, a reasonable route planning is needed and it is recommended that fences are installed to separate pedestrian from traffic.

⑫ Based on the layout of the school buildings, it is recommended to close roads adjacent to the construction area on the east side of the campus and arrange all students and faculty to use roads on the west side of the campus.

⑬ Temporary toilets and septic tanks should be provided in construction camps and night soil should be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment.

⑭ The construction contractors should remove and transport the construction solid wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District.

⑮ Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou New District.

⑯ It is required to strictly implement mitigation measures for sensitive protection targets and traffic safety protection regulations.

⑰ It is required to strictly implement World Bank's policies on COVID-19 prevention and control.

7.2.3 Gansu Senior Technical School of Mechanics

(1) Environmental impacts

① Significant impacts will be generated on the library, office building and dormitories in the neighborhood. The maximum construction noise is 76.48dB(A) and exceeds the standard by 16.48dB(A) in daytime.

② Located east of the construction site with a relatively short distance of approximately 25m, the dormitories are subject to significant noise impacts mainly during the noon and night resting hours. Therefore, the construction time must be reasonably planned to avoid significant impacts on students in rest periods. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying.

③ The impacts generated by the construction site on the sport ground are mainly reflected in the impacts of construction dust on the health of those exercising on the sport ground. The impact of construction noise is not significant.

④ Since the construction site is located in the middle of the campus, surrounded by walkways used in daily activities of teachers and students, the normal teaching activities and student daily life will be seriously disturbed if no effective measures of construction organization and management are implemented.

⑤ Analysis of the layout of the in-campus roads shows that the East Gate is the only access for vehicles, including transportation vehicles in the construction period. However, roads connecting this gate are relatively narrow and have high concentration of pedestrians and traffic in particular in the morning, noon and evening rush hours. Without a reasonable route planning for construction vehicles, traffic jam will occur and traffic safety hazards will arise to a certain extent.

(2) Mitigation measures

① A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the southern side of the construction site far away from the teaching building, dormitory building and practical training rooms.

② Protective fences should be provided along roads around the construction sites to

prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order.

③ The tower cranes should be located with the surrounding buildings and pedestrian safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians.

④ Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours.

⑤ Noises generated by the construction activities exceed the standard by 16.48dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows are installed to effectively avoid impacts of construction noises and assure compliance with the sound environment standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction for high-rise buildings.

⑥ Low-noise pneumatic or spiral pile drivers should be used.

⑦ In order to avoid health impacts by construction dust on those exercising on the sport ground, it is recommended that the school should adjust the teaching schedule to avoid teaching activities on the sport ground in the ground excavation stage with high incidence of dusting; double-layer dust screens should be used and water should be sprayed in the other construction periods to minimize dust generation.

⑧ Special personnel should be assigned to guide construction vehicles entering the construction site via the East Gate and make sure the vehicles strictly follow the designated routes on site. Pedestrians on the road should be diverted to assure traffic safety.

⑨ No honking is allowed when construction vehicles travel on campus.

⑩ A reasonable time schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided. Large transportation vehicles should not be allowed to enter the campus before 20:00.

⑪ Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage will be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Tianshui Municipal WWTP for compliance treatment.

⑫ Construction solid wastes must be collected at designated locations and subject to centralized disposal by Tianshui Environmental sanitation Bureau at designated solid wastes landfill sites.

⑬ Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Tianshui City.

7.2.4 Lanzhou University of Arts and Science

(1) Environmental impacts

① The construction site is located very close to the Practical Training Base to the south, with a distance of only 10m. The construction noise is 80dB(A) and exceeds the standard by 20dB(A) in day time. Significant impacts will be generated from construction noise on the teaching activities. Therefore, actions must be taken for noise reduction. Impacts on local pedestrians by dust generated in the construction period may be effectively mitigated through dust screens and timely water spraying.

② The teaching building and residential areas are located far away from the construction site, thus involving insignificant noise impacts.

③ Analysis of in-campus traffic condition shows that the School has only one gate located approximately 150m west of the construction site. According to the site survey, the School has two campuses, the South Campus and the North Campus, with Yanbei Road running in-between and the gates of the two campuses opposite to each other across the road. The South Campus, located south of Yanbei Road, mainly provides the functions of daily teaching and practical training while the North Campus, located north of Yanbei Road, mainly provides the function of student lodging and accommodation. Therefore, during the morning, noon and evening peak hours, students will travel between the two campuses across Yanbei Road for meals or classes. The high concentration and density of pedestrian flow in such hours bring traffic pressure on this road section.

④ The proposed project component is located in the South Campus of LUAS and it will be necessary to transport large volume of construction materials and debris or construction solid wastes in the construction period. Therefore, reasonable route planning for the construction vehicles is needed in order to avoid possible traffic safety hazards to the students.

(2) Mitigation measures

① It is recommended that a temporary exit be opened on the side of the construction site on Yanbei Road and the construction site is connected with the school fencing wall to form an independent and closed construction area. All construction plants, vehicles and personnel will

enter and leave the construction site via the temporary exit to realize full separation of construction activities from teaching activities, effectively avoid mutual impacts between construction workers, construction vehicles and pedestrians and vehicles in campus and minimize impacts on normal teaching activities on campus and the dense pedestrian flows appearing in the morning, noon and evening peak hours at the existing gate.

②A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the northeastern side of the construction site far away from the teaching building and practical training rooms.

③Protective fences should be provided along roads south of the construction site at the entrance and exit of the Practical Training Building to prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order.

④The tower cranes should be located with the surrounding buildings and pedestrian safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians.

⑤High-noise construction activities should be avoided in class hours.

⑥Noises generated by the construction activities exceed the standard by 20dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows (with a noise reduction of 10-15dB(A)) are installed to effectively avoid impacts of construction noises and assure compliance with the sound environment standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the building to be constructed and be able to move with the floors under construction.

⑦Foundation excavation should be carried out manually

⑧Special personnel should be assigned to guide construction vehicles entering the construction site and strictly travel along designated routes on site. No honking is allowed when construction vehicles travel on campus.

⑨A reasonable time schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided. Large transportation vehicles should not be allowed to enter the campus before 20:00.

⑩ Active efforts should be made to coordinate and negotiate with the traffic police about the need of traffic safety management at the front gate and early installation of video camera surveillance equipment.

⑪ The construction contractors should have all their staff on site registered and filed at the School Security Department and rent residential houses in the neighborhood as the accommodation of construction workers.

⑫ Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage should be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Lanzhou Municipal WWTP for compliance treatment.

⑬ Construction solid wastes should be declared and reported to Lanzhou Urban Management and Administrative Law Enforcement Bureau and a Letter of City Image and Environmental Sanitation Responsibility should be signed. Lanzhou Urban Management and Administrative Law Enforcement Bureau will be responsible for supervising and managing the disposal of all construction solid wastes of the proposed project.

⑭ Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou City.

7.2.5 Mitigation Measures for Sensitive Protection Objects

Environmental mitigation measures for the sensitive zones in the neighborhood mainly related to the construction period and include measures for mitigating air environment and sound environment impacts. Details of the impact factors and measures are described as follows:

(1) Air environment impact factors

The key factor impacting the air environment at the sensitive points in the construction period of the proposed project is construction dust.

Dusts generated in the construction period include dust raised by vehicles, dust raised by wind from open-air stockpiles and exposed sites and dust raised by wind from lime soil mixing sites. Construction dust will pollute the air environment around the construction site and affect the health of sensitive protection target population.

(2) Air environment impact mitigation measures

1) Transportation dust control

① Transportation management should be strengthened and actions should be taken to assure the transportation vehicles travel at specified speed.

② Transportation routes should be selected in a scientific way.

③ Transportation roads should be sprayed with water on a periodical basis.

④ Powdery materials should be packed in tanks or bags while fly ash should be packaged and transported in the wet method; Overloading is prohibited during transportation of soil, cement and lime, which should be covered with tarpaulin, with any spills en route immediately cleaned and removed.

2) Construction dust control

① Reasonable arrangements should be made for the mixing plants to achieve centralized mixing; lime soil mixing plants should not be located upwind of environmentally sensitive points; mixing plant operators should be provided with health protection services and masks and protective goggles; cement concrete should be outsourced from commercial concrete suppliers, if possible, and no cement mixing plant should be constructed.

② Material stockpiles should be located downwind of the sensitive areas and covered with tarpaulins; materials in storage should be reduced in volume and utilized in time. Fences should be provided when necessary and water should be sprayed on a periodical basis for dust prevention.

(3) Sound environment impact factors and their mitigation measures

1) Transportation noise

Mainly referring to noise generated in the process of vehicle travelling.

2) Construction plant noise

Different mechanical plants are used on the construction sites in different construction stages of the project. The key noise sources in the earthwork construction stage, for example, are bulldozers, excavators, loaders and transportation vehicles while those in the foundation construction stage are compactors, cranes and graders. Cutters are the main noise-generating equipment in the structure construction stage. The noise impact scope of the aforesaid construction plants is normally within 100m.

3) Traffic noise control

① Reasonable planning of construction sites

Construction sites of the proposed project should be reasonably selected so that the sensitive zones in the adjacency are avoided and noise pollution problems are avoided at the time of planning.

② Transportation road

Measures such as erecting “No Honking” and speed limit signs may be taken along sensitive road sections with schools, hospitals, and residential areas and nursing homes on both

sides and in campus.

③ Labor protection

Workers in high-noise working environment should take self-protection measures.

4) Construction plant noise control

① Reasonable site selection

High-noise plants in the living area of construction workers and in the construction sites should be located as far away from sensitive points as possible and, in the meanwhile, measures such as silencing, insulation and damping should be taken against strong noise sources.

② Construction technologies with low noise vibration should be selected.

③ Prevention and control of noises from construction activities adjacent to environmentally sensitive areas.

Temporary sound insulation fences should be installed on the boundary of the construction site; high-noise operations should be scheduled in such a way that the class hours and noon time resting hours are avoided; high-noise operations including pile driving should be suspended in night time. Where continuous operation is necessary, a request should be submitted to the local environmental protection authority for approval and a notice should be issued to teachers and students on campus as well as residents in the neighborhood; some specific high-noise operations may be implemented during the fixed festivals and holidays or winter and summer school holidays.

7.2.6 Codes of Practices on Road Traffic Safety Protection

It is obvious from the site visit that all the four schools supported by the Project are in the close adjacency to arterial urban streets with large traffic flow, dense population and potential risks of traffic safety.

In order to strengthen traffic safety education to students aiming to enhance their awareness of traffic safety laws and civilization, enhance their abilities of traffic safety cognition and self-protection and further influence and draw greater attention from student parents and social public to student traffic safety so that student traffic safety is better guaranteed and student traffic accidents are minimized, it is necessary to implement safety education and precaution activities targeted at the massive students and assure the normal school operation and healthy growth of students. In such a context, the following measures are proposed for project schools involving complicated road traffic condition and heavy traffic in association with the specific circumstances of the civil works components of these schools.

- (1) Stronger efforts should be made in traffic safety knowledge education to students.

Students should receive traffic safety knowledge education in diversified forms to increase the safety awareness of both teachers and students and enable students to learn the traffic rules in detail.

(2) A traffic safety duty system should be established and implemented at school intersections. The project schools should develop and strictly enforce the school gate and key intersection safety duty system based on their specific circumstances, with duties defined and personnel assigned. In the after-class peak hours, teachers and students should be assigned to guide traffic and make sure traffic rules are followed by students and duty shift records maintained.

(3) The PMOs of the project schools should set up and implement a system for regular inspection of key roads in campus and at school gates that students travel on their way to and from classes in the construction period. The schools should set up road inspection teams headed by the school officer in charge and with fixed positions and fixed personnel and fixed sections of responsibility. A responsibility-based management mechanism should be implemented in campus and special personnel assigned to inspect and keep records of the student compliance of traffic rules in campus and at school gates in the before-class and after-class peak hours.

(4) The project schools should incorporate road section safety guard and in-campus road inspection in the construction period into their staff management system and target appraisal of students, classes and teachers and develop and publish weekly statistics and monthly reports.

(5) Visible warning signs should be provided at school gates and road intersections with dense student pedestrians to warn construction vehicles to slow down at school gates and keep unauthorized vehicles away from campus. The construction area should be separated from the teaching areas and residential areas and warning signs should be erected around the construction area; teachers and students should neither enter the construction sites or operation areas (and students are banned to enter the construction area) nor stay or stick around the construction areas and should leave the aforesaid areas as soon as possible if they have to pass such areas out of necessity.

(6) A traffic safety target responsibility system and accountability system should be established and strictly enforced, with the school principals as the primary responsible person. The project schools should set up a sound and operable safety responsibility system based on their specific circumstances, under which tasks are broken down and assigned to specific personnel so as to realize the standardization and institutionalization of student traffic safety management and achieve the prevention-oriented management objectives. In case of a traffic

accident, the student victims should be sent to hospitals for timely rescue and responsible personnel investigated and identified.

(7) Windows and doors should be properly shut in classes to reduce noise impacts. Students should be advised to distract their attention from construction operations, construction noises construction activities. Teachers should make all efforts to properly guide the students and organize the lectures in class.

(8) Construction material transportation is an essential part of the construction process to meet the needs of the construction works. All teachers and students passing the construction areas need to watch for vehicles and loading and unloading operations to avoid being hit or hurt by vehicles or construction materials. When traffic is affected by any ongoing loading or unloading operation at the entrances, teachers and students should stop and wait till it is safe to pass.

(9) All construction workers should follow the codes of conducts of civilized construction and must not litter and defecate indiscriminately. Vehicles should be parked at designated positions in good order. All construction workers should attach paramount importance to traffic safety of students and teachers and take all measures and actions to guarantee construction safety as well as teacher and student safety. During construction, crane operation should be suspended in the morning, noon and evening peak hours when teachers and students enter and leave the campus. Safety briefings should be organized periodically so that problems are identified or handled in time to prevent and avoid safety accidents of whatever nature in the construction period.

7.3 General Environmental Codes of Practices in the Operation Period

(1) Water pollution control measures

1) Domestic sewage of the project schools should be pretreated in septic tanks to meet Class III standard limits specified in the Comprehensive Discharge Standard for Wastewater (GB8978-1996) before discharged into the local municipal sewage pipelines.

2) Each of the project schools should implement separate stormwater and sewage drainage system, with stormwater collected and discharged into the municipal stormwater pipeline and domestic sewage treated in septic tanks and diverted via the municipal sewer pipelines into the adjacent WWTP to be treated according to the respective standard before final discharge.

3) The sewage pipelines, in particular the pipe connections and elbows, should be inspected on a periodical basis to prevent environmental pollution caused by leakage of

domestic sewage.

4) Septic tanks should be periodically dredged and maintained, with the dried sludge delivered to the municipal domestic solid wastes landfills for hygienic landfill.

5) Each of the project schools should develop a special emergency response plan and assign a special responsible person so that any sewer blockage, leakage or abnormalities are resolved immediately to prevent contamination to the surrounding environment.

(2) Solid wastes

1) Classified garbage collection bins should be provided in the project area to achieve classified recovery of domestic solid wastes such as paper scrap, metals, glass, and corresponding management measures should be developed:

① A sound management system should be developed to define responsibilities and achieve periodical cleaning and collection of garbage;

② Degradable garbage bags should be used as a general requirement for garbage collection;

③ Reasonably garbage collection and transportation routes should be planned and protective measures taken to minimize spillage during transportation.

2) Solid wastes should be removed in time and subject to proper disposal.

Upon completion, the domestic solid wastes to be generated by teachers and students and other workers in the project schools will be ordinary solid wastes. Such solid wastes should be regularly collected by in-campus cleaners and stockpiled at existing domestic solid waste stockpiling sites in schools and then transported out of the campus by the local environmental sanitation authority on a periodical and timely basis for centralized hygienic landfill or incineration. The temporary solid waste stockpiling sites should be subject to periodically sterilization and pest control.

3) Stronger management actions should be taken to prohibit littering.

Garbage collection facilities should be reasonably arranged in the project area for the sake of convenient garbage discharge. In addition, stronger management actions should be taken by providing obvious signs or directives to avoid littering.

4) The sludge dredging frequency of septic tanks should be determined based on the technical standards of the septic tanks, which are usually dredged every 90 days, 180 days or 360 days. The dredged sludge may be used as organic fertilizers or delivered for harmless disposal.

(3) Sound environment

1) Rubber shock pads should be placed beneath the practical training equipment to reduce impacts from equipment vibration and noise.

2) Landscaping should be used as a measure for controlling noises. Areas around the buildings should be landscaped to not only absorb sound and reduce noise, but also stop dust and beautify environment.

3) Double-glazed windows should be used. Double-glazed windows (with a thickness of 150mm) may reduce indoor noise by 10 to 25 dB(A).

7.4 Environmental Codes of Practices for Specific sites in the Operation Period

7.4.1 Gansu Vocational College of Energy and Chemical

Waste oil rags to be generated in the automobile engineering practical training process as well as the cooking fume and kitchen wastewater to be generated from the canteen of the project school will cause certain impacts on the environment if not properly treated. Therefore, this EIA proposes the following specific measures for this project school.

1) Garbage collection bins should be provided in the practical training rooms and the waste oil rags generated in the teaching process are collected and mixed with domestic solid wastes for disposal according to uniform requirements.

2) Gas collecting hood, special flue and fume purifiers should be provided in the canteen operation rooms to assure that the cooking fume collected by the gas collecting hood enters via the special flue into the fume purifier for purification treatment to the Emission Standards of Cooking Fume (Trial) (GB18483-2001) before final emission. The flue ventilator should be positioned on the roof to achieve high-altitude emission.

3) The canteen flue ventilators should be located on the side far away from the student dormitories.

4) Outdoor oil separating tanks should be constructed as a part of the canteen to assure that the cooking wastewater generated from the canteen is treated in the outdoor oil separating tank and then delivered to the septic tank for digestion treatment before finally discharged into the municipal sewers.

5) The canteen should provide special collection bins for kitchen wastes. Such collection bins should be leak proof and properly sealed to prevent emission of odor and leakage during transportation. Special personnel should be assigned in the canteen to collect garbage and make sure the collected garbage is handled according to the disposal requirements of LND EPB.

6) The “Natural Gas Risk Prevention Measures” should be strictly enforced.

7.4.2 Natural gas risk control measures

1) Underground pipelines should be identified using warning boards erected on the ground while aboveground pipelines should be painted in one uniform warning color to promote public awareness of protection.

2) Problems discovered during periodical inspection, maintenance and normal operation of pipelines and valves should be rectified in a timely manner to avoid accidents arising from equipment failures;

3) Operators should strictly abide by the codes of operation to avoid accidents caused by operation errors;

4) Operational management should be strengthened through periodical training to improve the operating skills of pipeline workers;

5) Fire protection and extinguishing devices should be inspected regularly and assured in normal operation.

6) In case of a fuel gas leak, valves should be shut off and windows should be opened for immediate ventilation while open flames, telecommunication tools of whatever kinds and on/off operation of lights or electrical appliances and metal frictions should be avoided.

7) In case of a fire accident due to fuel gas leakage, wet rags should be placed over the fire point and valves shut off after the fire is completely extinguished. Never attempt to shut off the valves before the fire is extinguished because backflow may occur and lead to explosion when shutting off a valve immediately upon a fire.

8) Immediately evacuate personnel in the building and call 119 in case of a serious fire.

9) Intelligent fire alarm controllers should be selected for the fire alarm system.

10) The project schools should develop a detailed emergency response plan to make sure that emergency response actions are implemented under uniform command, responsible persons and departments are assigned and their duties and responsibilities defined and emergency accidents are put under control in the shortest possible time to reduce environmental and personal harms caused by natural gas leakage risks. Such emergency response plans should mainly include the following contents:

① Alarm call, contact information;

② Tiered response procedure;

③ Emergency environmental monitoring, emergency rescue, first aid and control measures;

- ④ Personnel emergency evacuation, evacuation organization plan;
- ⑤ Restoration measures;
- ⑥ Emergency response training plan.

7.5 Summary of Environmental Codes of Practices

See Table 7-1 for the general environmental codes of practices and Table 7-2 for the specific environmental codes of practices for the Project.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Table 7-1 General Environmental Codes of Practices

Project Stage	Environmental Problem	Mitigation and Protection Measures
Design stage	Site selection	<ol style="list-style-type: none"> 1. Satisfying the teaching needs to the maximum, convenient and practical; 2. Satisfying the actual needs of project unit and mitigating the problem of inadequate teaching space; 3. All formalities and procedures are fulfilled; no land acquisition and resettlement involved; compliant with local planning; 4. The project should be implemented through public tendering; 5. The plane layout should adopt a square and regular shape to increase energy efficiency; 6. Provided that consistency is maintained with the existing buildings of the project schools to the best possibility, the architectural style should be as simple as possible to save cost; 7. Decoration design should reflect control of cost effectiveness and functional applicability while material selection should highlight critical positions and low-to-medium class materials should be selected for non-critical positions; 8. Outdoor works mainly include essential outdoor water supply and drainage, electricity and telecommunication works within the land parcel as well as roads, plazas, landscaping and site leveling; 9. The main frame structure will have a design service life of 50 years; 10. The seismic fortification intensity may be promoted to a higher grade or keep the same grade as the required local intensity of Gansu Province, whichever is appropriate, but the seismic fortification measures should be provided one grade higher than the required local intensity ; 11. The existing water supply and drainage and electricity supply systems and facilities should be used where possible as the indoor systems in the buildings.
	Design requirements	<ol style="list-style-type: none"> 1. If there are any WWTPs and municipal pipelines around the project schools, domestic sewage in the operation period should be discharged via the municipal pipelines to the municipal WWTP for proper treatment; if the municipal wastewater system around the schools is not yet completed or under construction, it will be necessary to speed up the construction of the municipal pipelines and WWTPs; 2. Earthwork excavation and fill on site should be controlled provided that the functional, safety and environmental requirements of the buildings are satisfied; 3. The site drainage requirements as well as the pipeline installation requirements should be satisfied and followed; 4. Separate stormwater and wastewater drainage systems should be constructed, with the collected stormwater discharged into the municipal stormwater pipeline; 5. Electrical appliances and devices should not be installed in high-temperature, humid, dusty conditions and places with fire hazards and corrosion. The installation position should allow easy inspection, maintenance and disassembling; 6. Landscaping, sound insulation windows and other noise reduction measures should be included in the design in association

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>with the functional design of the school buildings so as to avoid impacts on normal teaching activities and student life by external traffic noise and assure compliance of sound environment;</p> <p>7. The pipeline design should comply with the operational functions and the construction, maintenance and spacing requirements of the various pipelines should be satisfied based on the nature, usage and installation methods of the different pipelines. The pipelines should be arranged in a centralized way if possible to preserve space for environment.</p>
Construction stage	Construction site	<p>1. Working hours The working hours on the construction sites are 7:00 am to 22:00 pm. Construction is banned during the noon hours of 12:00 to 14:00 and restricted at night. Where night construction becomes inevitable, a notice should be given to the local residents and relevant formalities fulfilled and actions taken to reduce impacts on residents. The arrival and departure time of construction transportation vehicles must comply with the requirements of local governments;</p> <p>2. Construction camp arrangement If possible, the construction contractors should rent local residential houses in the project area for lodging and accommodation and avoid locating the construction camps and canteens on the construction sites, where only offices and material stockpiling sheds are allowed.</p> <p>3. Traffic safety 1) Best traffic safety practices should be adopted in all aspects related to transportation during the construction of the Project to best avoid traffic accidents and reduce casualty of both project personnel and general public. In such a context, the following measures should be taken: ① Drivers should be made particularly aware of the importance of safety rules; ② Driving skill should be improved and all drivers must be licensed; ③ Driving time should be limited and driver duty shift schedule developed to avoid fatigue driving; ④ Dangerous road sections and driving in the dangerous hours of a day should be avoided to minimize accident probability; 2) Vehicle maintenance should be conducted on a periodical basis and manufacturer approved spare parts used to avoid serious traffic accidents resulting from equipment failure or premature failure of parts and components. 3) All efforts should be made to reduce simultaneous occupation of roads by pedestrians and construction vehicles; 4) Road signs and visibility should be improved in cooperation with local communities and competent authority to promote the level of road safety as a whole, in particular on roads adjacent to schools and other areas where children are present. Traffic and pedestrian safety education campaigns (e.g. advertisement activities in schools) should be organized in cooperation with local communities; 5) A mechanism should be established for coordination with the emergency response personnel to assure that appropriate first aid is available in case of any accidents;</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>6) Local materials should be used where possible to shorten haulage. The relevant facilities (e.g. worker dormitories) should be located adjacent to the project sites to avoid increase of traffic flow;</p> <p>7) Traffic safety control measures should be taken and road signs and signalmen should be used to warn pedestrians and traffic against dangers.</p> <p>4. Spoils and Construction Solid Wastes Spoils and construction solid wastes should be stockpiled at landfills designated by local environmental sanitation authority and should not be dumped at free will.</p> <p>5. Public Information Platform</p> <p>① Construction data plates should be installed at obvious positions to indicate the project name, construction site area, names of project implementation agency, construction contractors and supervision and administration agencies as well as names of project responsible person, dates of construction commencement and completion, complaint hotline and specific environmental protection measures;</p> <p>② The construction contractors should post a Notice of Project Commencement around the construction site 7 days before the scheduled date of project commencement to disclose information including project overview, construction plan, names of respective construction units and name of project responsible person, complaint hotline, etc.;</p> <p>③ Night construction should be restricted. When night construction is inevitable under special circumstances, actions should be taken to control the impacts of night construction on the surrounding environment and a prior notice should be given to the local residents to seek their understanding;</p> <p>④ The construction contractors should post notices around the project sites and the premises of affected residents and enterprises to notify the public of pending interruption of services (including water supply, electricity supply, telecommunication and traffic, etc.) 5 days in advance.</p> <p>6. Prevention of Accidents and Risks The construction contractors should develop an accident prevention plan and assign an emergency responsible person and seek aids from the concerned authorities immediately upon the occurrence of any accidents;</p> <p>7. Personal Safety and Health The construction sites should be separated and fenced up and traffic signs and guardrails provided to assure pedestrian safety; safety training should be provided to the construction workers before construction commences; personal protection devices must be provided and mandatorily used; all construction activities should be suspended in case of a rainstorm or any emergency accidents;</p> <p>8. Prohibited Activities Unapproved tree felling outside the approved construction site is prohibited; use of unapproved toxic substances, including</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
	Water pollution	<p>lead paint, asbestos, open flame and alcohol, is prohibited.</p> <ol style="list-style-type: none"> 1. Stormwater Management <ol style="list-style-type: none"> 1) A sound stormwater and drainage system is already in place in each project school. During construction, the stormwater collection gutters must be kept unblocked and no construction materials should be stockpiled over and adjacent to the stormwater collection gutters to avoid possible obstruction. 2) Soil contaminated (e.g. by oil, grease or paints) in the construction period should be removed in time to prevent massive contamination of stormwater. 3) The construction contractors are encouraged to use weather forecast and rainstorm warning functions to respond to any upcoming adverse rainfall conditions. 4) During rainfalls, timely attention should be paid to make sure that the stormwater collection gutters and drainage pipelines remain unblocked and any obstructions are removed in time. 2. Construction Wastewater <ol style="list-style-type: none"> 1) Wastewater from vehicle cleaning and washing, construction material washing, concrete curing and aggregate washing on construction sites should be collected via the gutters and then mixed and diluted to reduce wastewater pH value before such wastewater enters the temporary sedimentation tank for treatment. The temporary sedimentation tank should have an adequate size to guarantee 12-hour wastewater retention as specified in the standard and the treated wastewater should be fully reused in construction site cleaning, construction material washing, concrete curing and aggregates re-washing; 2) Muddy stormwater and slurry water should be collected into the sedimentation tank for sedimentation and reuse; 3) Machine oil leaked from machinery and wastewater from equipment and material washing should be settled in oil separating tank before reuse to control impacts from sediments and suspended substances contained in the construction wastewater on the surrounding environment; 4) The oil separating tanks and sedimentation tanks should be subject to proper anti-seepage treatment to avoid possible impacts on the surrounding environment. 5) Oil or water leaks must be inspected and repaired before any mechanical equipment is used. 3. Domestic sewage <ol style="list-style-type: none"> 1) Temporary toilets, septic tanks and wastewater collection tanks should be provided on construction sites. Laundry and kitchen wastewater generated by the construction workers should be subject to oil separation and sedimentation before discharged into the school sewage pipelines. Night soil generated in the temporary toilets should be stored in septic tanks temporarily before removed by the local environmental sanitation authority on a periodical basis. 2) In order to prevent possible pollution of ground water, anti-seepage cement should be used in the foundation construction

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>of the wastewater collection tanks.</p> <p>3) Environmental protection education for construction workers should be strengthened to promote environmental awareness and prevent uncontrolled littering and wastewater discharge.</p>
	<p align="center">Air pollution</p>	<p>1. Dust pollution control</p> <p>1) First of all, to manage the construction activities on site, a construction site environmental protection responsibility system should be set up, with the Project Manager as the primary responsible person, and environmental protection measures and special program for construction dust control must be included in the construction organization design, which should not be put into implementation until approved by the competent authority.</p> <p>2) Dust screens and fences should be set up for the building structures according to the respective specification to reduce the possibility of construction dust;</p> <p>3) Ground surface of the construction sites and traffic roads should be hardened and sprayed with water for dust suppression;</p> <p>4) Vehicle washing equipment should be installed at entrances and exits of construction sites to make sure all transportation vehicles are washed and cleaned and dust and dirt are removed before leaving site to keep the access roads and the surrounding area in a clean condition;</p> <p>5) Proper covering or other effective dust prevention measures should be implemented on construction sites where construction solid wastes cannot be removed in time by the required deadline;</p> <p>6) Slurry tanks and slurry troughs should be provided on construction sites involving slurry operation to prevent slurry spillage. Waste slurry should be transported out of site in closed tankers;</p> <p>7) Pre-mixed concrete and pre-mixed mortar should be used on construction sites according to the respective requirements and in-situ open-air mixing is prohibited;</p> <p>8) During earthwork excavation and backfill operations, water should be sprayed for dust suppression and to reduce the duration of dusty operation; in case of winds above Grade 4, no earthwork construction and demolition operations should be implemented;</p> <p>9) Construction materials, sand and gravel, soil and other dust-generating materials stockpiled on site should be covered with dust screen or cloth and dust suppression agent or water should be sprayed on a periodical basis to prevent wind erosion and dust generation;</p> <p>10) Bulk materials, construction solid wastes and debris conveyed on and over buildings and structures should be put in closed containers and tossing and throwing from high altitude is prohibited.</p> <p>11) Dense dust screen or cloth with excellent dust suppression effect should be installed outside the scaffolds during building construction and dust prevention measures such as water spraying, mist spraying should be taken during building demolition.</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>12) Vehicles transporting construction solid wastes and debris should be washed and cleaned in time to make sure that they are clean when leaving the sites; transportation vehicles should be properly covered to achieve air-tight transportation and prevent possible spillage and leakage on roads.</p> <p>13) Construction sites should be 100% fenced up; material stockpiles 100% covered; vehicles 100% washed; construction site surface 100% hardened; demolition sites 100% adopting wet operation method and debris transportation vehicles 100% achieving air-tight transportation.</p> <p>2. Vehicle Tail Gas</p> <p>1) Construction plants and vehicles in good operating condition should be selected;</p> <p>2) Fuel-driven construction plants and vehicles must be operated in normal condition to assure compliant tail gas emission;</p> <p>3) Equipment should be used in a reasonable way and equipment maintenance and repair should be strengthened.</p> <p>3. Decoration Exhaust Gas</p> <p>1) Environment-friendly decoration materials should be selected;</p> <p>2) Doors and windows should be opened after the decoration work is completed for effective ventilation.</p> <p>3) Indoor air quality monitoring should be conducted before the school buildings are put into service to assure that they are not occupied until full compliance is achieved.</p>
	Noise pollution	<p>1. Reasonable planning of construction sites</p> <p>The number of construction plants mobilized on site should be minimized provided that the constructional need is satisfied. Steel rebar and steel sheet processing should be outsourced, if possible, to reduce noise source from on-site processing; the implementation agency should develop a comprehensive plan to arrange the noise sources at a centralized location where possible to reduce the scope of construction noise impacts.</p> <p>2. Assuring normal operation of construction plants</p> <p>State-of-the-art low-noise equipment should be selected if possible; high-noise equipment should be used at lower frequency and low-noise pneumatic or spiral pile drivers should be used for pile driving; high-efficiency silencers should be installed on loaders, excavators and other mobile noise sources and honking should be banned on construction sites to avoid and reduce noise disturbance. The construction contractors should conduct periodical inspection and maintenance of the construction plants in the construction process to assure normal operation and avoid high-intensity noises generated from operation of defective equipment.</p> <p>High-noise mechanical equipment should be located away from the side adjacent to residential areas and noise-reduction fences should be set up on construction sites located in a distance of less than 5m from residence, hospital and school buildings.</p> <p>3. Reasonable scheduling of construction time</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>①The construction time should be reasonably scheduled to have high-noise construction periods (e.g. foundation construction) arranged in winter or summer holidays if possible. Otherwise, the construction activities should at least be coordinated with the teaching activities to, e.g. have high-noise construction activities arranged in afternoons or weekends to avoid operation of high-noise equipment in time periods for concentrated teaching and student rest.</p> <p>②The construction sequence should be reasonably arranged and no construction should occur in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day.</p> <p>③When continuous construction is needed, a request should be submitted to the local environmental protection authority. Night construction must not be implemented without prior approval and without the acknowledgement by schools and residents in the neighborhood. High-noise equipment should be arranged for daytime construction and the standards specified in Emission Standard for Environmental Noise on the Boundary of Construction Sites of Buildings (GB12523-2011) should be strictly enforced.</p> <p>4. Construction Vehicle Noise Control Measures</p> <p>①Stronger efforts should be made in transportation management. The implementation agency and the construction contractors should negotiate on environmental protection education for transportation workers. The speed of transportation vehicles should be controlled and overloading banned.</p> <p>②Vehicle maintenance and repair should be strengthened to assure normal operation;</p> <p>③Direction boards should be provided at entrances and exits of construction sites and unnecessary idle speed, braking, ignition and honking should be avoided.</p> <p>④Transportation vehicles are banned to travel in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day to assure normal resting of local residents.</p> <p>⑤Traffic noise may generate certain impacts on sound environment sensitive points in the neighborhood. Therefore, the construction contractors should promote the environmental protection awareness of the construction workers, learn about the local customs and habits and reasonably arrange transportation time. In centralized residential areas and other environmentally sensitive areas, speed limit, horn prohibition and other self-conscious actions should be taken to control vehicles and other construction plants so as to prevent and reduce noise impacts.</p> <p>⑥Transportation vehicles should travel in low speed on campus to not only reduce impacts by traffic noise on teaching activities, but also protect personal safety on campus. Vehicles traveling on campus should strictly follow the planned route. Random parking and honking are prohibited.</p> <p>5. Decoration Noise Control Measures</p> <p>When it is unlikely to implement the decoration works in a centralized time period, management of decoration noise should be strengthened and strict decoration management measures should be developed to minimize impacts caused by decoration</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>noises. Doors and windows should be properly closed while decoration work is going on. The decoration time period should be limited and no decoration activity of any kind should be conducted in the noon hours from 12:00 to 14:00 and the night hours from 22:00 to 7:00 the next day.</p>
	<p>Solid waste pollution</p>	<ol style="list-style-type: none"> 1. Construction Solid Wastes <ol style="list-style-type: none"> ① Construction solid wastes generated in the construction period should be removed in time to avoid secondary pollution in the process of stockpiling. ② Some package bags generated in the construction process need to be classified and stockpiled, with the reusable parts adequately recycled and the other parts incorporated into and treated together with domestic solid wastes. ③ Earthwork construction should be carefully designed and organized to achieve substantial earthwork excavation and fill balance and avoid long haulage; waste concrete and bricks discarded on site should be removed in time. ④ Solid wastes should be subject to classified treatment. Reusable construction solid wastes, such as steel rebar, should be recycled to avoid waste of resources while the non-reusable construction solid wastes need to be dumped at designated sites. ⑤ Vehicles transporting bulk materials and wastes should be properly sealed, fastened and covered to avoid spillage on the way; vehicles transporting soil should travel along designated route in the specified time period. Spoil disposal should be conducted in a concentrated period and avoid storm season and be accompanied with simultaneous compacting. ⑥ Vehicles transporting construction solid wastes and debris should be washed and cleaned in time to make sure that they leave the sites clean and tidy; transportation vehicles should be properly covered to achieve air-tight transportation and prevent possible spillage and leakage on roads. ⑦ Vehicle washing equipment should be installed at the entrances and exits of construction sites to make sure all transportation vehicles are washed and cleaned and dust and dirt removed before leaving site to keep the access roads and the surrounding area in a clean condition; ⑧ The project schools should strictly abide by the requirements of local authorities on treatment of construction solid wastes. 2. Domestic solid wastes <p>The construction contractors should properly carry out the collection and stockpiling of domestic solid wastes and remove the domestic solid wastes out of the construction sites in a timely manner. Education to the construction workers should be strengthened and civilized construction should be promoted to put an end to uncontrolled dumping of domestic solid wastes and assure the environmental quality on construction sites and the surrounding areas. Closable classified garbage bins should be provided in the temporary living areas and the domestic solid wastes should be collected and transported on a daily basis to the adjacent garbage collection stations and then by the environmental sanitation authority to municipal domestic solid wastes landfills for hygienic landfill.</p> 3. Management Requirements for Waste Paint Buckets

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>①The construction units of all project schools should give priority to the water-based paint. If non-water-based paint is required, the waste paint buckets should be managed in strict accordance with the "Management Requirements for Waste Paint Buckets" in this report.</p> <p>②Management requirements for waste paint buckets: The temporary storage sites of waste paint buckets generated during decoration fall under the category of "Facilities Used for Temporary Storage by Hazardous Waste Generating Units". Therefore, waste paint buckets need to be stored separately. Moreover, the temporary storage site of waste paint buckets is forbidden to be close to the protection area prone to kindling and high voltage electricity. Warning signs should be set up in the storage site and rainproof, fire prevention and seepage prevention measures should be taken. The temporary storage site should be equipped with lighting and fire fighting facilities. The temporary storage site should be equipped with lighting and fire fighting facilities. At the same time, the construction unit should establish a collection, transfer and storage ledger to record the whole process from the generation, collection and temporary storage of waste paint buckets until they are delivered to the manufacturer for recycling. See Table 5-5 and Table 5-7 for detailed record tables.</p>
	Ecological impact	<p>1. Ecological Resource Protection and Management Measures</p> <p>①Construction site layout and arrangement should be reasonable and optimized to minimize the scope of construction activities and land damages caused during project implementation;</p> <p>②Bricks, stone, sand, cement, timber among other construction materials needed and outsourced for the construction works should be transported to the construction site at time intervals and in loads roughly matching the actual demand on site to minimize land area occupied by material stockpiles; upon completion of the construction works, residual materials should be removed out of site in time to enable landscaping of construction sites;</p> <p>③Temporary protective fences should be erected around trees remaining on the construction site before the construction works commence based on the results of construction site investigation;</p> <p>④Neither should the trees be attached with marks and labels other than the identification label nor should the tree protection zones have construction materials stockpiled or stored and construction plants and equipment parked in their immediate adjacency;</p> <p>⑤Temporary intercepting ditches should be constructed on construction sites and floodways should be built to replace surface runoff passage damaged by the Project to divert rain season flood and prevent the construction works from erosion by surface runoffs;</p> <p>⑥On the premise that construction quality is assured, the construction contractors should take all possible actions to shorten the time of temporary land occupation, control the construction time of earthwork and maintain stable cut and filled slope to minimize impacts outside the scope of the construction works.</p> <p>2. Soil Erosion Control Measures</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>1) Engineering Measures</p> <p>①Leveling and backfill: including measurement of backfill area and depth, backfill bulk density and rolling bulk density, determination of backfill rolling method, determination of forecast and protection measures of possible subsidence and its hazards;</p> <p>②Planning of transportation routes of backfill material and top soil;</p> <p>③Depression backfill and utilization: waste soil and ballasts should be adequately utilized for depression backfill so that the depressions are properly backfilled and leveled and waste materials are used up. Terrain, construction conditions and area among other factors should be considered upon determining backfill method. Normally, manual backfill and mechanical backfill are integrated and used simultaneously, with bulldozers used to level off large depressions in rectangular partitions and manual methods used to handle small depressions, corners and edges that are not accessible for mechanical operation;</p> <p>④Upon rough leveling, the key backfill positions should be identified first based on the terrain and topographical features and the backfill height of the project area. Then, bulldozers or other construction plants are used to move the fill materials to the depression backfill zone. During backfill operation, the fine and particulate sand and gravel materials should be placed on bottom layers while aggregates of larger particle sizes on the top before rolling and compacting. After rough leveling is over, shovels and spaces should be used to manually handle and level off the disturbed edges and corners of the construction zones and small depressions left over from mechanical leveling until the final leveling effect required in the design document is achieved.</p> <p>2) Temporary Measures</p> <p>Since the civil works of each project school are of a large scale, it is necessary to stockpile the sand and aggregates needed for building foundation excavation, backfill and construction works for a long time. In order to avoid wind and water erosion, it is necessary to have the stockpiles temporarily covered and protected. Such temporary covering and protection measures include temporary covering with dust screen, water spraying, etc.</p> <p>①Covering : Temporary covering measures should be taken to prevent the exposed parts of the temporary stockpiles from wind and water erosion. Dense dust screen may be selected as the covering material. Dust screen should not be removed until the earthwork backfill commences and should be rolled up backward from the ground pit position and fully removed and recovered after the backfill operation is completed.</p> <p>②Water spraying : 1 or 2 passes of water spraying should be conducted on the leveled construction sites. When the water infiltration depth reaches about 2cm, a surface crust with an effective wind erosion resistance thickness will be formed to facilitate restoration of water and soil conservation function.</p> <p>3) Vegetation Measures</p> <p>Native species should be selected for vegetation restoration on construction sites and spoil disposal areas upon the completion</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		of the construction works. Introduction of alien species should be avoided.
	Social impact	<ol style="list-style-type: none"> 1. The implementation agency should develop construction worker management methods with the specific circumstances of the project schools taken into account and submit such methods to the project schools for review. The construction workers should not enter the school buildings without prior approval and should not cause interferences and disturbances to normal teaching activities; 2. The “Environmental Codes of Practices on Safety and Health” for construction workers must be strictly followed to not only safeguard the health and safety of construction workers, but also prevent introduction of infectious and epidemic diseases into the campuses; 3. A stable and transparent communication channel should be established by GDoE, Gansu Provincial PMO and the project school management to address the various problems encountered in the operation period of the Project. 4. It is recommended that the PMO opens commuting bus lines between LND TVET Park and Lanzhou Urban Center and develops reasonable bus routes, stops and time table to reduce waiting time and allow easy commuting for teachers and provide preferential fare to students. 5. Regarding the potential grievances from some teachers of the 2 merged schools, in addition to active efforts in promoting the Project, the respective project schools should set up a sound communication mechanism and a grievance redress mechanism and create a comfortable working and living environment for the teachers so as to enable them to get free from family worries and concentrate on teaching activities ; 6. As a part of the competence building activities under the Project, specific contents should be designed for teachers pending transformation to promote their competence and help them adapt themselves to the new specialties at the fastest possible speed. Regarding students pending specialty adjustment, the concerned project schools should adjust the affected students to new specialties based on market demand and free will of students, and, if necessary, provide them with psychological counseling. 7. It is recommended that the project schools provide more part-time jobs for poverty-stricken students. 8. It is recommended that the schools take advantage of their geographical location and establish off-campus practice and practical training bases to provide not only training but also more opportunities of employment for the students. 9. It is recommended that the LND government authorities continue improving the pension insurance and unemployment insurance policies and consult the LND enterprises or institutions on providing preferential policies and safeguards for local land-depleted farmers to get long-term and stable jobs. The project schools can also provide employment opportunities during the implementation of the Project to local land-depleted farmers, in particular, women, poor households and disabled individuals. In addition, stronger efforts should be made in training for land-depleted farmers to increase their employment rate.
	Cultural relics	1. immediately suspend the work at the construction site where such cultural relics are discovered and reinforce site protection;

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
	protection	<ol style="list-style-type: none"> 2. immediately report the police and cultural relics administration for verification and further actions; 3. immediately have the protection area determined once the cultural relics discovered are verified by experts; 4. carry out rescue excavation of the cultural relics in case of urgent construction progress or risks of natural damages; 5. Rescue excavation of cultural relics should be carried out by professionals using professional equipment and should not be conducted by the contractors on their own; 6. The cultural relics authority needs to determine the level of protection of the respective cultural relics. If the respective cultural relics are determined as county level, corresponding protection measures should be taken and the construction contractor should not resume the construction until an instruction to resume construction is received from the Cultural Relics Bureau; if the respective cultural relics are determined as provincial or national level, a report needs to be submitted to the State Cultural Relics Bureau and corresponding protection measures should be taken and the construction contractor should not resume the construction until an instruction is received from the Cultural Relics Bureau. 7. If the discovery is deemed as a significant cultural relics discovery, the Project will need to go through the process of re-siting justification.
	Health and safety	<ol style="list-style-type: none"> 1. All the buildings on construction sites should be kept in good integrity; the temporary buildings and structures should be structurally safe and reliable to resist impacts of local bad weathers and have appropriate sunlight and proper facilities for partial isolation of dust and noises; the floors should be kept level, flat and slip-resistant. 2. The construction contractors should assure availability of first aid complying with the respective standard. Appropriate first aid toolkits should be provided on construction sites; a written emergency response procedure should be available and cover the full process till the patients are finally transferred to an appropriate medical institution. 3. Occupational health and safety training should be provided to all new construction workers to introduce to them the basic working rules and personal protection rules on construction sites and teach them how to prevent injuries to other workers; the training contents should include basic knowledge of hazards and dangers, specific hazards present in work places, codes of safe operation, fire emergency response procedures, evacuation procedures and natural disaster response procedures (the final contents will be determined based on actual needs). The training should include detailed introduction of specific hazards and their color codes in work places. 4. Correct signs should be provided in hazardous areas (e.g. power distribution rooms, etc.), devices, materials, safety measures and emergency exits and actions should be taken to prevent unauthorized access to such areas; the signs should conform to the international standards and be easy to understand for staff, visitors and general public (to be determined depending on actual circumstances). 5. If a worker holding a handheld or electrical tool feels vibrations on his/her hands and arms or a worker standing or sitting on a vibrating surface feels vibration in the whole body, such vibration should be controlled through equipment selection,

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>installation of vibration reduction gaskets or devices or limiting exposure time;</p> <ol style="list-style-type: none"> 6. Appropriate personal protection devices should be determined and provided by the construction contractors to the construction workers to assure that the workers, their colleagues and occasional visitors are adequately protected and no unnecessary inconvenience is caused to the users; 7. Clamping hazards should be eliminated upon design of machinery and actions should be taken to prevent possible physical harms by the machinery projections in normal operation; 8. Warning signs should be installed on all live electrical devices and wires; all the electricity wires, cables and handheld electrical tools should be inspected to identify any damaged or exposed wires and the maximum allowable working voltage of handheld tools should be determined according to the manufacturer's recommendations; all electrical equipment used in humid (or possibly humid) environment should be equipped with double insulation / grounding; all electrical wires buried under the ground should be identified and marked before any digging operation commences. 9. Actions should be taken to prevent the construction workers from overexertion. Training should be provided to workers on how to correctly move and handle materials during construction and demolition activities, including specifying the upper limit of load a single operator can handle (and the requirement of mechanical aid or double operation beyond the upper limit) ; The layout plan of the construction site should be so developed to avoid, to the best possibility, needs for manual movement of heavy objects; tools should be so selected and work table so designed to reduce, to the best possibility, the level of force and the duration of handholding needed and facilitate the workers to keep the correct position (and, when necessary, use the users' and adjusted worktable). 10. Actions should be taken to prevent trip-over and fall-over. A sound site cleaning and management system should be implemented to, for example, classify the scattered building materials and demolished parts and place them in areas away from walkways, remove excessive wastes and spilled liquids on a periodical basis, place electrical wires and ropes in public areas and labeled corridors and use skid-resistance mats. 11. Safety protection requirements for high-altitude operation: Temporary fall protection measures should be taken, e.g. providing handrails and foot baffles around scaffolds and at the edges of other high-altitude operation areas to prevent fall of materials; training should be provided to the workers on actual operation of the fall prevention devices which are used during operations of high altitude of or more than 2m from the ground or on occasions with the possibility of falling into machines in operation, water or other liquids or hazardous substances or falling from an opening on the working face; training should be provided to the workers on actual operation of personal fall prevention equipment, e.g. full-body harness and buffering lanyard capable of carrying a load of 5000lb; rescue procedures should be developed to rescue workers successfully prevented from falling. The connecting points of fall prevention equipment should also be able to carry a load of 5000lb; control zone and safety supervision system should be set up to warn the workers against the presence of a fall hazard zone in the adjacency and covers

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<p>of openings on floors, ceilings and walkway pavements should be reinforced, marked and indicated.</p> <p>12. Safety protection requirements on preventing hit by objects: Solid wastes should be discarded and discharged at designated and restricted areas. Wastes should be conveyed safely through the chutes from upper floors to lower floors; appropriate protective devices and fastening methods should be used during sawing, cutting, welding, grinding, polishing, chiseling and carving operations; passages and corridors should be kept unblocked and actions should be taken to avoid heavy-duty machinery travelling on scattered wastes; temporary fall protection measures should be taken, e.g. providing handrails and foot baffles around scaffolds and at the edges of other high-altitude operation areas to prevent fall of materials; appropriate personal protection devices (e.g. safety glasses with protective edges, masks, safety helmets and safety boots) should be used.</p> <p>13. Safety protection requirements for moving machinery: The vehicle travelling, machinery operation and personnel walking areas should be planned and zoned; one-way traffic rules should be adopted to control vehicle traffic; speed limit should be stipulated; and on-site traffic should be guided by trained signalmen (wearing obvious vests or jackets); Personnel working or walking in the operation zones of heavy-duty machinery should wear visible vests to increase visibility and training should be provided to teach workers how to have eye contacts with equipment operators before approaching a vehicle in operation; it should be assured that back-up buzzers are installed on moving equipment; hoisting equipment (e.g. cranes) should be properly inspected, maintained and confirmed suitable to move on road before they are used to lift heavy objects up to a higher working level for fastening.</p> <p>14. Dust protection requirements: All dust removal methods, e.g. water spraying or non-toxic chemical agents, should be used to reduce dust raised by vehicles; where excessive amount of dust is present, personal protection devices (e.g. dust masks) should be used.</p> <p>15. The construction contractors should develop procedures and systems for reporting and recording the following contents: occupational accidents and diseases, hazardous circumstances and accidents. Such systems should enable the construction workers to immediately report to their own direct superintendent any circumstances causing serious hazards to life and health. When the construction workers are caught in any occupational injuries and risks, suspicious occupational diseases, dangerous situations and accidents, an immediate report should be submitted to the top management; the top management should investigate into all reported occupational accidents, occupational diseases, risks and incidents, during which assistance should be sought from professionals with knowledge and competences of occupational safety.</p> <p>16. Health education should be provided to the construction workers, e.g. execution of information communication strategy, strengthening face-to-face consultation, addressing systematic problems affecting individual behavior, encouraging use of personal protection devices, avoiding spread of disease to others, etc. In addition, the construction workers should be encouraged to use mosquito repellent, clothing and mosquito nets and other blocking methods to avoid spread of diseases from mosquito bites.</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		17. Health examinations should be organized for construction workers to prevent the spread of infectious and epidemic diseases.
	Suggestions on Camp Layout and Construction Route Management	<p>1. When each project school is signing a contract with the construction contractor, the contract contents should include but not limited to the following:</p> <ul style="list-style-type: none"> ① Sort out the environmental protection measures in the EMP Report and incorporate the environmental protection measures into the contract; ② The contract should specify whether the school allows the contractor to set up living camps, kitchens, toilets, office camps, material processing plants and other sites within the scope of the school construction site, and specify the corresponding solutions and environmental protection requirements, which should be strictly implemented after the construction team enters. It is recommended that contractors arrange accommodation and meals for construction personnel by renting private houses. Under restrictions by conditions, if living areas must be set up on campus, the contractors must be required to manage domestic wastewater, domestic garbage and kitchen waste, and make clear relevant terms and conditions, so as not to pollute the campus environment; ③ The contract should specify the requirements for the layout of the construction site, requirements for the construction driving route, requirements for traffic organization and management, and requirements for the management of camps and personnel; ④ The contract should explicitly require the contractors to provide medical first aid kits, which should contain commonly used drugs and that contractors should provide relevant medical supplies such as disinfection, hemostasis and bandaging required for emergency treatment of minor injuries; ⑤ The contract should explicitly require the contractors to strictly implement the relevant policies and regulations of the World Bank on epidemic prevention and control. <p>2. When the general layout design of the construction is carried out at the construction drawing phase of the Project, the design unit should communicate with the school and the EIA unit in a timely manner, and verify the feasibility of the layout scheme of the construction camps in all aspects. The Project should not be commenced until it meets the World Bank's requirements for environmental protection.</p>
Operation stage	Water pollution	<p>1. Domestic sewage of the project schools should be pretreated in septic tanks to meet Class III standard limits specified in the Comprehensive Discharge Standard for Wastewater (GB8978-1996) before discharged into the local municipal sewage pipelines.</p> <p>2. Each of the project schools should implement separate stormwater and sewage drainage system, with stormwater collected and discharged into the municipal stormwater pipeline and domestic sewage treated in septic tanks and diverted via the municipal sewer pipelines into the adjacent WWTP to be treated according to the respective standard before final discharge.</p> <p>3. The sewage pipelines, in particular the pipe connections and elbows, should be inspected on a periodical basis to prevent environmental pollution caused by leakage of domestic sewage.</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Environmental Problem	Mitigation and Protection Measures
		<ol style="list-style-type: none"> 4. Septic tanks should be periodically dredged and maintained, with the dried sludge delivered to the municipal domestic solid wastes landfills for hygienic landfill. 5. Each of the project schools should develop a special emergency response plan and assign a special responsible person so that any sewer blockage, leakage or abnormalities are resolved immediately to prevent contamination to the surrounding environment.
	Noise pollution	<ol style="list-style-type: none"> 1. Rubber shock pads should be placed beneath the practical training equipment to reduce impacts from equipment vibration and noise. 2. Landscaping should be used as a measure for controlling noises. Areas around the buildings should be landscaped to not only absorb sound and reduce noise, but also stop dust and beautify environment. 3. Double-glazed windows should be used. Double-glazed windows (with a thickness of 150mm) may reduce indoor noise by 10 to 25 dB(A).
	Solid waste pollution	<ol style="list-style-type: none"> 1. Classified garbage collection bins should be provided in the project area to achieve classified recovery of domestic solid wastes such as paper scrap, metals, glass, and corresponding management measures should be developed: <ol style="list-style-type: none"> ① A sound management system should be developed to define responsibilities and achieve periodical cleaning and collection of garbage; ② Degradable garbage bags should be used as a general requirement for garbage collection; ③ Reasonably garbage collection and transportation routes should be planned and protective measures taken to minimize spillage during transportation. 2. Solid wastes should be removed in time and subject to proper disposal. Upon completion, the domestic solid wastes to be generated by teachers and students and other workers in the project schools will be ordinary solid wastes. Such solid wastes should be regularly collected by in-campus cleaners and stockpiled at existing domestic solid waste stockpiling sites in schools and then transported out of the campus by the local environmental sanitation authority on a periodical and timely basis for centralized hygienic landfill or incineration. The temporary solid waste stockpiling sites should be subject to periodically sterilization and pest control. 3. Stronger management actions should be taken to prohibit littering. Garbage collection facilities should be reasonably arranged in the project area for the sake of convenient garbage discharge. In addition, stronger management actions should be taken by providing obvious signs or directives to avoid littering. 4. The sludge dredging frequency of septic tanks should be determined based on the technical standards of the septic tanks, which are usually dredged every 90 days, 180 days or 360 days. The dredged sludge may be used as organic fertilizers or delivered for harmless disposal.

Table 7-2 Environmental Impacts and Mitigation Measures for Specific Sites

Project Stage	Name of Specific Component	Mitigation and Protection Measures
Construction stage	Gansu Vocational College of Energy and Chemical	<ol style="list-style-type: none"> 1. One centralized construction camp should be set up at the northeastern corner of the campus used for construction of Buildings No. 30, 31, 32 and 33. The construction camp and the three construction sites should be separated from the surrounding dormitory buildings with closeable fences. Another centralized construction camp should be set up in an unoccupied area in the middle east of the campus for construction of Building No. 4 and No. 24. A fully closed management system will be adopted for the construction sites. 2. Special personnel should be assigned to carry out tour inspections around the construction area. Construction workers should not be allowed to enter the student dormitory buildings and practical training buildings without due authorization while non-constructional personnel should not be allowed to enter the construction area without due authorization. 3. Stronger efforts should be made in inspection in the construction sites around student dormitories, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites. 4. Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours. 5. Low-noise pneumatic or spiral pile drivers should be used. 6. The construction site of Practical Training Building No. 4 is located very close to Practical Training Building No. 3 and the noise standard is exceeded by 10.46dB(A). In order to assure effective noise reduction, sound insulation retaining walls (with a noise reduction of 6-10dB(A)) should be provided around the construction site and sound insulation windows should be installed to avoid impacts from construction noise and assure that the sound environment in the Practical Training Building complies with the standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the western and northern sides of the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction. 7. Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization. 8. Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety. 9. No honking is allowed when construction vehicles travel on campus. 10. Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road 11. Temporary toilets and septic tanks should be provided in construction camps and night soil should be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<p>12. The construction contractors should remove and transport the construction solid wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District.</p> <p>13. Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou New District.</p> <p>14. It is required to strictly implement mitigation measures for sensitive protection targets and traffic safety protection regulations.</p> <p>15. It is required to strictly implement World Bank's policies on COVID-19 prevention and control.</p>
	<p align="center">Gansu Finance and Trade Vocational College</p>	<p>1. A centralized construction camp should be set up in the southeastern corner of the campus for construction of school buildings. Closeable fences are required to separate it from the construction area.</p> <p>2. The construction site in Area C of Dormitory Building No. 22 should be fenced up. A temporary gate should be opened on the east side of the site near the road for construction workers and vehicles to pass through under closed-off management. Anti-falling frames should be set up above the road on the west side of the site to prevent falling objects from harming people.</p> <p>3. Special personnel should be assigned to carry out tour inspections around the construction area. Construction workers should not be allowed to enter the student dormitory buildings and practical training buildings without due authorization while non-constructional personnel should not be allowed to enter the construction area without due authorization.</p> <p>4. Stronger efforts should be made in inspection in the construction sites around student dormitories, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites.</p> <p>5. Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours.</p> <p>6. Low-noise pneumatic or spiral pile drivers should be used.</p> <p>7. Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization.</p> <p>8. Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety.</p> <p>9. No honking is allowed when construction vehicles travel on campus.</p> <p>10. Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road.</p> <p>11. Due to campus environment restrictions, it is necessary to provide a special road on the construction site of Building No. 18 as a construction transportation access road connecting the East Gate. Therefore, a reasonable route planning is needed and it is recommended that fences are installed to separate pedestrian from traffic.</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<ol style="list-style-type: none"> 12. Based on the layout of the school buildings, it is recommended to close roads adjacent to the construction area on the east side of the campus and arrange all students and faculty to use roads on the west side of the campus. 13. Temporary toilets and septic tanks should be provided in construction camps and night soil should be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment. 14. The construction contractors should remove and transport the construction solid wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District. 15. Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou New District. 16. It is required to strictly implement mitigation measures for sensitive protection targets and traffic safety protection regulations. 17. It is required to strictly implement World Bank's policies on COVID-19 prevention and control.
	<p align="center">Gansu Senior Technical School of Mechanics</p>	<ol style="list-style-type: none"> 1. A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the southern side of the construction site far away from the teaching building, dormitory building and practical training rooms. 2. Protective fences should be provided along roads around the construction sites to prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order. 3. The tower cranes should be located with the surrounding buildings and pedestrian safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians. 4. Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours. 5. Noises generated by the construction activities exceed the standard by 16.48dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows are installed to effectively avoid impacts of construction noises and assure compliance with the sound environment standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction for high-rise buildings. 6. Low-noise pneumatic or spiral pile drivers should be used. 7. In order to avoid health impacts by construction dust on those exercising on the sport ground, it is recommended that the school should adjust the teaching schedule to avoid teaching activities on the sport ground in the ground excavation stage with high incidence of dusting; double-layer dust screens should be used and water should be sprayed in the other construction periods

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<p>to minimize dust generation.</p> <ol style="list-style-type: none"> 8. Special personnel should be assigned to guide construction vehicles entering the construction site via the East Gate and make sure the vehicles strictly follow the designated routes on site. Pedestrians on the road should be diverted to assure traffic safety. 9. No honking is allowed when construction vehicles travel on campus. 10. A reasonable time schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided. Large transportation vehicles should not be allowed to enter the campus before 20:00. 11. Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage will be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Tianshui Municipal WWTP for compliance treatment. 12. Construction solid wastes must be collected at designated locations and subject to centralized disposal by Tianshui Environmental sanitation Bureau at designated solid wastes landfill sites. 13. Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Tianshui City.
	Lanzhou University of Arts and Science	<ol style="list-style-type: none"> 1. It is recommended that a temporary exit be opened on the side of the construction site on Yanbei Road and the construction site is connected with the school fencing wall to form an independent and closed construction area. All construction plants, vehicles and personnel will enter and leave the construction site via the temporary exit to realize full separation of construction activities from teaching activities, effectively avoid mutual impacts between construction workers, construction vehicles and pedestrians and vehicles in campus and minimize impacts on normal teaching activities on campus and the dense pedestrian flows appearing in the morning, noon and evening peak hours at the existing gate. 2. A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the northeastern side of the construction site far away from the teaching building and practical training rooms. 3. Protective fences should be provided along roads south of the construction site at the entrance and exit of the Practical Training Building to prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order. 4. The tower cranes should be located with the surrounding buildings and pedestrian safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians. 5. High-noise construction activities should be avoided in class hours. 6. Noises generated by the construction activities exceed the standard by 20dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<p>(with a noise reduction of 10-15dB(A)) are installed to effectively avoid impacts of construction noises and assure compliance with the sound environment standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the building to be constructed and be able to move with the floors under construction.</p> <ol style="list-style-type: none"> 7. Foundation excavation should be carried out manually 8. Special personnel should be assigned to guide construction vehicles entering the construction site and strictly travel along designated routes on site. No honking is allowed when construction vehicles travel on campus. 9. A reasonable time schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided. Large transportation vehicles should not be allowed to enter the campus before 20:00. 10. Active efforts should be made to coordinate and negotiate with the traffic police about the need of traffic safety management at the front gate and early installation of video camera surveillance equipment. 11. The construction contractors should have all their staff on site registered and filed at the School Security Department and rent residential houses in the neighborhood as the accommodation of construction workers. 12. Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage should be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Lanzhou Municipal WWTP for compliance treatment. 13. Construction solid wastes should be declared and reported to Lanzhou Urban Management and Administrative Law Enforcement Bureau and a Letter of City Image and Environmental Sanitation Responsibility should be signed. Lanzhou Urban Management and Administrative Law Enforcement Bureau will be responsible for supervising and managing the disposal of all construction solid wastes of the proposed project. 14. Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou City.
	Wastewater Treatment and Water Recycling Center of LND TVET Park Zone A	<ol style="list-style-type: none"> 1. The TVET Park Administration Committee should strengthen the supervision of the construction progress of this Wastewater Treatment and Water Recycling Center and assure that it is put into service before the LND schools are completed and commissioned to enable effective collection of domestic sewage in these schools. 2. Upon the completion of the Center, an online water quality monitoring system should be installed according to the requirement of LND EPB to conduct regular monitoring on a quarterly basis and submit the monitoring results via PMO to the World Bank so as to assure that the collected sewage complies with the water quality standard after treatment.
	Mitigation measures for sensitive protection objects	<ol style="list-style-type: none"> 1) Transportation dust control: ①Transportation management should be strengthened and actions should be taken to assure the transportation vehicles travel at specified speed; ②transportation routes should be selected in a scientific way; ③transportation roads should be sprayed with water on a periodical basis; ④powdery materials should be packed in tanks or

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<p>bags while fly ash should be packaged and transported in the wet method; Overloading is prohibited during transportation of soil, cement and lime, which should be covered with tarpaulin, with any spills en route immediately cleaned and removed.</p> <p>2) Construction dust control: ① Reasonable arrangements should be made for the mixing plants to achieve centralized mixing; lime soil mixing plants should not be located upwind of environmentally sensitive points; mixing plant operators should be provided with health protection services and masks and protective goggles; cement concrete should be outsourced from commercial concrete suppliers, if possible, and no cement mixing plant should be constructed. ② Material stockpiles should be located downwind of the sensitive areas and covered with tarpaulins; materials in storage should be reduced in volume and utilized in time. Fences should be provided when necessary and water should be sprayed on a periodical basis for dust prevention.</p> <p>3) Traffic noise control: ① Construction sites of the proposed project should be reasonably selected so that the sensitive zones in the adjacency are avoided and noise pollution problems are avoided at the time of planning. ② Measures such as erecting “No Honking” and speed limit signs may be taken along sensitive road sections with schools, hospitals, and residential areas and nursing homes on both sides and in campus. ③ Workers in high-noise working environment should take self-protection measures.</p> <p>4) Construction plant noise control: ① High-noise plants in the living area of construction workers and in the construction sites should be located as far away from sensitive points as possible and, in the meanwhile, measures such as silencing, insulation and damping should taken against strong noise sources. ② Construction technologies with low noise vibration should be selected.</p> <p>5) Control of noise from construction activities adjacent to environmentally-sensitive areas: Temporary sound insulation fences should be installed on the boundary of the construction site; high-noise operations should be scheduled in such a way that the class hours and noon time resting hours are avoided; high-noise operations including pile driving should be suspended in night time. Where continuous operation is necessary, a request should be submitted to the local environmental protection authority for approval and a notice should be issued to teachers and students on campus as well as residents in the neighborhood; some specific high-noise operations may be implemented during the fixed festivals and holidays or winter and summer school holidays.</p>
	Code of practice on road traffic safety protection	<p>1. Stronger efforts should be made in traffic safety knowledge education to students. Students should receive traffic safety knowledge education in diversified forms to increase the safety awareness of both teachers and students and enable students to learn the traffic rules in detail.</p> <p>2. A traffic safety duty system should be established and implemented at school intersections. The project schools should develop and strictly enforce the school gate and key intersection safety duty system based on their specific circumstances, with duties defined and personnel assigned. In the after-class peak hours, teachers and students should be assigned to guide traffic and</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<p>make sure traffic rules are followed by students and duty shift records maintained.</p> <ol style="list-style-type: none"> 3. The PMOs of the project schools should set up and implement a system for regular inspection of key roads in campus and at school gates that students travel on their way to and from classes in the construction period. The schools should set up road inspection teams headed by the school officer in charge and with fixed positions and fixed personnel and fixed sections of responsibility. A responsibility-based management mechanism should be implemented in campus and special personnel assigned to inspect and keep records of the student compliance of traffic rules in campus and at school gates in the before-class and after-class peak hours. 4. The project schools should incorporate road section safety guard and in-campus road inspection in the construction period into their staff management system and target appraisal of students, classes and teachers and develop and publish weekly statistics and monthly reports. 5. Visible warning signs should be provided at school gates and road intersections with dense student pedestrians to warn construction vehicles to slow down at school gates and keep unauthorized vehicles away from campus. The construction area should be separated from the teaching areas and residential areas and warning signs should be erected around the construction area; teachers and students should neither enter the construction sites or operation areas (and students are banned to enter the construction area) nor stay or stick around the construction areas and should leave the aforesaid areas as soon as possible if they have to pass such areas out of necessity. 6. A traffic safety target responsibility system and accountability system should be established and strictly enforced, with the school principals as the primary responsible person. The project schools should set up a sound and operable safety responsibility system based on their specific circumstances, under which tasks are broken down and assigned to specific personnel so as to realize the standardization and institutionalization of student traffic safety management and achieve the prevention-oriented management objectives. In case of a traffic accident, the student victims should be sent to hospitals for timely rescue and responsible personnel investigated and identified. 7. Windows and doors should be properly shut in classes to reduce noise impacts. Students should be advised to distract their attention from construction operations, construction noises construction activities. Teachers should make all efforts to properly guide the students and organize the lectures in class. 8. Construction material transportation is an essential part of the construction process to meet the needs of the construction works. All teachers and students passing the construction areas need to watch for vehicles and loading and unloading operations to avoid being hit or hurt by vehicles or construction materials. When traffic is affected by any ongoing loading or unloading operation at the entrances, teachers and students should stop and wait till it is safe to pass. 9. All construction workers should follow the codes of conducts of civilized construction and must not litter and defecate indiscriminately. Vehicles should be parked at designated positions in good order. All construction workers should attach

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<p>paramount importance to traffic safety of students and teachers and take all measures and actions to guarantee construction safety as well as teacher and student safety. During construction, crane operation should be suspended in the morning, noon and evening peak hours when teachers and students enter and leave the campus. Safety briefings should be organized periodically so that problems are identified or handled in time to prevent and avoid safety accidents of whatever nature in the construction period.</p>
Operation stage	Gansu Vocational College of Energy and Chemical	<ol style="list-style-type: none"> 1. Garbage collection bins should be provided in the practical training rooms and the waste oil rags generated in the teaching process are collected and mixed with domestic solid wastes for disposal according to uniform requirements. 2. Gas collecting hood, special flue and fume purifiers should be provided in the canteen operation rooms to assure that the cooking fume collected by the gas collecting hood enters via the special flue into the fume purifier for purification treatment to the Emission Standards of Cooking Fume (Trial) (GB18483-2001) before final emission. The flue ventilator should be positioned on the roof to achieve high-altitude emission. 3. The canteen flue ventilators should be located on the side far away from the student dormitories. 4. Outdoor oil separating tanks should be constructed as a part of the canteen to assure that the cooking wastewater generated from the canteen is treated in the outdoor oil separating tank and then delivered to the septic tank for digestion treatment before finally discharged into the municipal sewers. 5. The canteen should provide special collection bins for kitchen wastes. Such collection bins should be leak proof and properly sealed to prevent emission of odor and leakage during transportation. Special personnel should be assigned in the canteen to collect garbage and make sure the collected garbage is handled according to the disposal requirements of LND EPB. 6. The “Natural Gas Risk Prevention Measures” should be strictly enforced.
	Natural gas risk prevention measures	<ol style="list-style-type: none"> 1. Underground pipelines should be identified using warning boards erected on the ground while aboveground pipelines should be painted in one uniform warning color to promote public awareness of protection. 2. Problems discovered during periodical inspection, maintenance and normal operation of pipelines and valves should be rectified in a timely manner to avoid accidents arising from equipment failures; 3. Operators should strictly abide by the codes of operation to avoid accidents caused by operation errors; 4. Operational management should be strengthened through periodical training to improve the operating skills of pipeline workers; 5. Fire protection and extinguishing devices should be inspected regularly and assured in normal operation. 6. In case of a fuel gas leak, valves should be shut off and windows should be opened for immediate ventilation while open flames, telecommunication tools of whatever kinds and on/off operation of lights or electrical appliances and metal frictions should be avoided. 7. In case of a fire accident due to fuel gas leakage, wet rags should be placed over the fire point and valves shut off after the fire

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project Stage	Name of Specific Component	Mitigation and Protection Measures
		<p>is completely extinguished. Never attempt to shut off the valves before the fire is extinguished because backflow may occur and lead to explosion when shutting off a valve immediately upon a fire.</p> <p>8. Immediately evacuate personnel in the building and call 119 in case of a serious fire.</p> <p>9. Intelligent fire alarm controllers should be selected for the fire alarm system.</p> <p>10. The project schools should develop a detailed emergency response plan to make sure that emergency response actions are implemented under uniform command, responsible persons and departments are assigned and their duties and responsibilities defined and emergency accidents are put under control in the shortest possible time to reduce environmental and personal harms caused by natural gas leakage risks. Such emergency response plans should mainly include the following contents:</p> <ul style="list-style-type: none"> ① Alarm call, contact information; ② Tiered response procedure; ③ Emergency environmental monitoring, emergency rescue, first aid and control measures; ④ Personnel emergency evacuation, evacuation organization plan; ⑤ Restoration measures; ⑥ Emergency response training plan.

8. Environmental Monitoring Plan

8.1 Monitoring Objectives and Principles

The environmental impacts generated by the Project mainly occur in the construction period and include domestic pollution arising from construction workers, noises arising from construction operations and dust caused by earthwork excavation and quarrying and foundation construction and other forms of pollution. In addition, serious local pollution caused by unexpected pollution accidents should also be considered. Therefore, in order to have a full and timely understanding of pollution status in the Project as well as the environmental quality changes in the neighborhood and provide services to regional environment management in the project area, it is necessary to implement environmental monitoring over the Project.

An environmental monitoring plan is developed for the purpose of monitoring the implementation of various measures so as to make timely adjustments to the environmental protection action plan based on the monitoring results and provide a basis for determining the implementation time and developing implementation plan of the environmental protection measures. Monitoring plans are developed based on the predictions of the key environmental factors of the various stages (construction stage or operation stage).

Implementation of the environmental monitoring plan enables timely understanding of the environmental quality of the project implementation area and is helpful to the analysis and implementation of targeted mitigation of environmental impacts caused by project construction to assure that the environmental impacts of the Project are minimized, people's livelihood is not affected and the natural and ecological environment is not damaged. The environmental monitoring plan of the proposed project may be implemented by an agency consigned by the Provincial PMO. This agency should have the required monitoring qualifications and will be responsible for collecting and analyzing monitoring data, producing and submitting the environmental analysis reports to the client, with a copy submitted by the client to the World Bank. See Table 8-1 for the organizational responsibilities of the monitoring plan of the Project.

Table 8-1 Organizational Responsibilities of the Monitoring Plan

Activity to be implemented	Responsible agency
Collecting monitoring data	Environmental monitoring agency with the required monitoring qualifications
Data analysis	Monitoring agency will be responsible for data collection and analysis.
Preparing environmental report	Monitoring agency produces analysis report based on the monitoring data.
The aforesaid monitoring plan may be implemented by an environmental monitoring agency consigned by the Provincial PMO. The environmental monitoring agency will collect and analyze the monitoring data on a quarterly basis and produce and submit to the client an environmental analysis report, with a copy submitted by the client to the World Bank.	
Management plan	After the environmental analysis report is submitted, the Provincial PMO will be responsible for centralized management and filing of the report and distribute the report to the project executive offices of the project schools as the environmental impact summary report of the implementation period of the Project to be used for final acceptance of the Project.

8.2 Monitoring agency

It is recommended that the project management agency will consign a qualified environmental monitoring agency to implement the monitoring plan and undertake instant monitoring of environmental impacts caused by any unexpected pollution accidents. Such arrangement will not only leverage the advantages of existing environmental monitoring organizations in full supply of professional staff and monitoring equipment, but also enable the management agency of the proposed project to save costs and expenditures of monitoring equipment and staff. The implementation agency should sign the construction period monitoring contract with the monitoring agency before the construction commences.

8.3 Environmental monitoring plan

The monitoring plan of this World Bank Project covers two stages, the construction period and the operation period. In the construction period, the key monitoring factor is indoor air quality while, in the operation period, the key monitoring factor is the standard compliance of pollutants including wastewater, exhaust gas and noises. The total monitoring cost is 325,000 yuan, see Table 8-2 for details of the monitoring factors.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Table 8-2 Project Monitoring Plan

Period	Environmental factor	Monitoring content	Monitoring site	Monitoring frequency	Applicable standard	Monitoring cost (CNY10000)	Routine monitoring agency	Periodical monitoring agency
Construction period (before indoor decoration is completed and put into service)	Indoor air quality	HCHO(formaldehyde), NH3, benzene, TVOC, radioactivity	School buildings to be built in Gansu Vocational College of Energy and Chemical	Once	Indoor Air Quality Standard (GB/T18883-2002)	4	Consigned agency with required monitoring qualifications	LND EPB
			School buildings to be built in Gansu Finance and Trade Vocational College			4		
			School buildings to be built in Gansu Senior Technical School of Mechanics			4		Tianshui EPB
			School buildings to be built in Lanzhou University of Arts and Science			2		Lanzhou EPB
Subtotal						14		
Operation period	Wastewater quality	pH, BOD5, COD, SS, animal and vegetable oil, feces coliforms	Main discharge outlet of Gansu Vocational College of Energy and Chemical	Once/year for 5 consecutive years	Class III in Comprehensive Discharge Standard for Wastewater (GB8978-1996)	2.5	Consigned agency with required monitoring qualifications	LND EPB
			Main discharge outlet of Gansu Finance and Trade Vocational College			2.5		
			Main discharge outlet of Gansu Senior Technical School of Mechanics			2.5		Tianshui EPB
			Main discharge outlet of Lanzhou University of Arts and Science			2.5		Lanzhou EPB

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

	Cooking fume	Kitchen fume	Cooking fume emission outlet of Gansu Vocational College of Energy and Chemical	Once/year for 5 consecutive years	Emission Standards of Cooking Fume (Trial)(GB18483-2001)	2.5		LND EPB
	Site boundary noise	LAeq	Boundary of Gansu Vocational College of Energy and Chemical	Once/year for 5 consecutive years	Environmental Noise Discharge Standard on the Boundary of Industrial Enterprises (GB 12348-2008)	1.5	Consigned agency with required monitoring qualifications	LND EPB
Boundary of Gansu Finance and Trade Vocational College			1.5			Tianshui EPB		
Boundary of Gansu Senior Technical School of Mechanics			1.5			Lanzhou EPB		
Boundary of Lanzhou University of Arts and Science			1.5					
Subtotal						18.5		
Total						32.5		

Note:

The charging standard of indoor air quality acceptance monitoring is estimated at 20,000 yuan/time;

Cost of wastewater quality monitoring is estimated at the baseline price of CNY5,000/discharge outlet-time;

Cost of cooking fume monitoring is estimated at the baseline price of CNY 5,000/discharge outlet-time;

Cost of site boundary noise monitoring is estimated at the baseline price of CNY 3,000/time.

9. EMP Information Management

9.1 Information Exchange

Environmental management requirements should be disclosed among the different departments and job positions of the PMOs, the employer, the contractors and the operators through internal information exchange and also published to external parties (the stakeholders and social public, etc.). Internal information exchange may be implemented via diversified channels such as meetings, internal briefings, but 1 formal meeting must be held every month and all exchanged information must be recorded and filed. External information exchange should be conducted semiannually or annually and minutes should be prepared and filed for information exchange with cooperative units.

9.2 Recording Mechanism

In order to assure effective operation of the environmental management system, a robust recording system must be established to keep records of the following aspects:

- (1) Legal and regulatory requirements;
- (2) Licenses and permits;
- (3) Environmental factors and relevant environmental impacts;
- (4) Training;
- (5) Inspection, checking and maintenance activities;
- (6) Monitoring data;
- (7) Effectiveness of corrective and preventive actions;
- (8) Information of stakeholders;
- (9) Audits;
- (10) Reviews.

In addition, the above records must also be subject to necessary controls, including record identification, collection, cataloging, filing, storage, management, maintenance, inquiry, storage life and disposal, etc.

9.3 Reporting Mechanism

The contractors, operators, monitoring agencies, environmental supervision engineers and PMOs should record and report project progress, EMP execution status and environmental monitoring results to the concerned authorities in a timely manner, mainly including contents of the following six aspects:

(1) The Project Environmental Supervision Engineer should record in detail the execution status of EMP on a monthly basis and submit the weekly reports and monthly reports in time to the Project Employer and the project school PMOs. The weekly reports and monthly reports should include execution status of environmental protection measures, progress of environmental monitoring and monitoring data.

(2) The contractors and operators should record in detail the project progress and EMP execution status on a quarterly basis and submit quarterly reports to the project school PMOs with a copy to local EPB.

(3) After the monitoring activities are carried out, the monitoring agency should submit the monitoring report to the contractors (operators) and the environment supervision engineer in a timely manner.

(4) The project school PMOs should submit the Project Progress Report to the Provincial PMO in a timely manner, with a copy to the Provincial EPB. The Project Progress Report prepared by the project school PMOs (e.g. monthly reports, quarterly reports, yearly reports, etc.) must include contents about EMP progress, e.g. progress and outcomes of EMP execution, in particular, environmental monitoring results.

(5) In case of any significant incidents involving environmental protection violations, the Environmental Supervision Engineer and the PMOs should submit a report to the local government authority of environmental protection and, when necessary, to the government authorities of upper levels.

(6) The yearly EMP execution reports of the Project must be finalized and submitted to the World Bank before the 31st of March the next year and such reports may include the following contents:

- ① Implementation status of training plans;
- ② Progress of project implementation;
- ③ Execution status of environmental protection measures, implementation status of environmental monitoring and key monitoring results;
- ④ Records of the key contents, solutions and public satisfaction of public complaints, if any;
- ⑤ EMP execution plan for the coming year.

9.4 File Management

In the implementation process of the EMP, the World Bank, the Provincial Project Management Office, the Project School PMOs, the EIA agency, the Engineer and the

construction contractors shall properly manage the respective files and documents. See Table 9-1 for detail in this regard.

Table 9-1 File Management Requirements for the Concerned Institutions

Name of institution	File management
1. Construction contractors	<ol style="list-style-type: none"> 1) Preparing, archiving and submitting to the Construction Engineer records of construction progress on a weekly basis; 2) Completing, together with the Construction Supervision Engineer, the construction site checklists prior to commencement of construction works and having them archived and submitted to the project school PMOs; 3) Preparing detailed records of the implementation status of construction works in case of any emergency and unexpected circumstances and having such records archived and submitted to the Construction Supervision Engineer; 4) Carrying out rectification within 3 working days (or 10 working days where coordination is required from the management agency) as of the receipt of the Rectification Notice, with the respective documents put into archives.
2. Construction Supervision Engineer	<ol style="list-style-type: none"> 1) Preparing, archiving and submitting to the project school PMOs records of information reported by construction contractors on a weekly basis; 2) Completing, together with the Construction Contractor, the construction site checklists prior to commencement of construction works and having them archived and submitted to the project school PMOs; 3) Preparing detailed records of the implementation status of construction works in case of any emergency and unexpected circumstances and having such records archived and submitted to the project school PMOs; 4) Proposing and following up with rectification solutions to environmental protection problems encountered by the contractors in the construction activities, including issuing Rectification Notice and rectification checklists and putting the inspection documents into archives;
3. Organizations with EIA qualifications for construction projects	<ol style="list-style-type: none"> 1) Preparing the contents of the EMP and putting the first draft, the draft for review and the draft for approval into archives.
4. Project School PMOs	<ol style="list-style-type: none"> 1) Organizing theme studies or surveys and having documents of workshops and surveys well managed and put into archives; 2) Properly maintaining, managing and archiving records of complaints arising in the construction and operation process of the Project; 3) Recording and archiving information reported by the Construction Supervision Engineer on a quarterly basis and submitting reports (statements) to the Provincial PMO; 4) Receiving site checklists submitted by the construction contractors and construction supervision engineers and verifying and archiving environmentally sensitive problems; 5) Sorting and putting into archives submitted Rectification Notices.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

5. Provincial PMO	<ol style="list-style-type: none">1) Preparing and supervising the implementation status of EMP and putting it into archives;2) Summarizing, on a semi-annual basis, information reported the project school PMOs and submitting relevant reports to the World Bank; putting the reports into archives;3) Coordinating with the other concerned authorities to address significant environmental issues and maintaining records and archives of the specific actions taken;
6. World Bank	<ol style="list-style-type: none">1) Recording and archiving, on a half-year basis, information reported by the Provincial PMO.

10. Cost Estimation

10.1 Environmental Protection Investment Estimation for Gansu Vocational College of Energy and Chemical

Table10-1 Environmental Protection Investment Estimation for Gansu Vocational College of Energy and Chemical

SN	Usage	Content	Investment (CNY10000)	Remarks
Construction Period				
1.1	Wastewater Management	Temporary sedimentation tank and oil separating tank for construction wastewater	1.0	1 No.
		Wastewater collection tank and oil separating tank for domestic sewage	1.0	1 No.
		Temporary toilets, septic tanks	5	1 No.
1.2	Solid Waste Management	Closeable classified garbage bins	0.4	4 Nos.
1.3	Dust Control	Dust screen, dust reduction through water spraying, shielding tarpaulin, paved access roads, etc.	20	
		Construction fences, 1000m per site	25	Totally 5 sites
1.4	Noise Management	Entrance and exit signs, traffic guidance	0.5	
		Colored steel sheet sound insulation retaining wall	20	
1.5	Subtotal		72.9	
Operation period				
2.1	Solid wastes	Domestic solid waste collection bins	2	20 Nos.
2.2	Noise management	Aluminum alloy insulating glass window	/	Already included in construction investment
2.3	Exhaust gas management	Ventilation fans	/	
		Gas collecting hood, fume purifier, special flue	50	
2.4	Wastewater management	In-building wastewater collection system	/	Already included in construction investment
		Canteen oil separating tank	10	
2.6	Subtotal		62	
3	Overheads	Supervision cost	10	Construction period supervision
		Management and labor cost	3	Labor costs and expenses
		Equipment procurement and material cost	3	Office expenses during management
4	Monitoring cost	Indoor air quality monitoring	4	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

		Operation period wastewater quality monitoring	2.5	
		Operation period fume monitoring	2.5	
		Operation period noise monitoring	1.5	
5	Landscaping cost		/	Already included in construction investment
6	Environmental protection knowledge training		4.6	
7	Contingencies		16.6	Calculated at a percentage of 10%
Total			182.6	

10.2 Environmental Protection Investment Estimation for Gansu Finance and Trade Vocational College

Table10-2 Environmental Protection Investment Estimation for Gansu Finance and Trade Vocational College

SN	Usage	Content	Investment (CNY10000)	Remarks
Construction Period				
1.1	Wastewater Management	Temporary sedimentation tank and oil separating tank for construction wastewater	1.0	1 No.
		Wastewater collection tank and oil separating tank for domestic sewage	1.0	1 No.
		Temporary toilets, septic tanks	5	1 No.
1.2	Solid Waste Management	Closeable classified garbage bins	0.4	4 Nos.
1.3	Dust Control	Dust screen, dust reduction through water spraying, shielding tarpaulin, paved access roads, etc.	20	
		Construction fences, 1000m per site	20	Totally 4 sites
1.4	Noise Management	Entrance and exit signs, traffic guidance	0.5	
1.5	Subtotal		47.9	
Operation Period				
2.1	Solid wastes	Domestic solid waste collection bins	2	20 Nos.
2.2	Noise management	Aluminum alloy insulating glass window	/	Already included in construction investment
2.3	Exhaust gas management	Ventilation fans	/	Already included in construction investment
2.4	Wastewater management	In-building wastewater collection system	/	Already included in construction

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

				investment
2.5	Subtotal		2	
3	Overheads	Supervision cost	10	Construction period supervision
		Management and labor cost	3	Labor costs and expenses
		Equipment procurement and material cost	3	Office expenses during management
4	Monitoring cost	Indoor air quality monitoring	4	
		Operation period wastewater quality monitoring	2.5	
		Operation period noise monitoring	1.5	
5	Landscaping cost		/	Already included in construction investment
6	Environmental protection knowledge training		4.6	
7	Contingencies		7.85	Calculated at a percentage of 10%
Total			86.35	

10.3 Environmental Protection Investment Estimation for Gansu Senior Technical School of Mechanics

Table 10-3 Environmental Protection Investment Estimation for Gansu Senior Technical School of Mechanics

SN	Usage	Content	Investment (CNY10000)	Remarks
Construction Period				
1.1	Wastewater Management	Temporary sedimentation tank and oil separating tank for construction wastewater	1.0	1 No.
		Wastewater collection tank and oil separating tank for domestic sewage	1.0	1 No.
		Temporary toilets, septic tanks	5	1 No.
1.2	Solid Waste Management	Closeable classified garbage bins	0.4	4 Nos.
1.3	Dust Control	Dust screen, dust reduction through water spraying, shielding tarpaulin, paved access roads, etc.	20	
		Construction fences, 1000m per site	5	1 site
1.4	Noise Management	Entrance and exit signs, traffic guidance	0.5	
		Colored steel sheet sound insulation retaining wall	20	
1.5	Subtotal		52.9	

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Operation period				
2.1	Solid wastes	Domestic solid waste collection bins	2	20 Nos.
2.2	Noise management	Aluminum alloy insulating glass window	/	Already included in construction investment
2.3	Exhaust gas management	Ventilation fans	/	Already included in construction investment
2.4	Wastewater management	In-building wastewater collection system	/	Already included in construction investment
		100m ³ septic tank	10	
2.5	Subtotal		12	
3	Overheads	Supervision cost	10	Construction period supervision
		Management and labor cost	3	Labor costs and expenses
		Equipment procurement and material cost	3	Office expenses during management
4	Monitoring cost	Indoor air quality monitoring	2	
		Operation period wastewater quality monitoring	2.5	
		Operation period noise monitoring	1.5	
5	Environmental protection knowledge training		4.6	
6	Contingencies		9.35	Calculated at a percentage of 10%
Total			102.85	

10.4 Environmental Protection Investment Estimation for Lanzhou University of Arts and Science

Table 10-4 Environmental Protection Investment Estimation for Lanzhou University of Arts and Science

SN	Usage	Content	Investment (CNY10000)	Remarks
Construction Period				
1.1	Wastewater Management	Temporary sedimentation tank and oil separating tank for construction wastewater	1.0	1 No.
		Wastewater collection tank and oil separating tank for domestic sewage	1.0	1 No.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

		Temporary toilets, septic tanks	5	1 No.
1.2	Solid Waste Management	Closeable classified garbage bins	0.4	4 Nos.
1.3	Dust Control	Dust screen, dust reduction through water spraying, shielding tarpaulin, paved access roads, etc.	20	
		Construction fences, 1000m per site	5	1 site
1.4	Noise Management	Entrance and exit signs, traffic guidance	0.5	
		Colored steel sheet sound insulation retaining wall	20	
1.5	Subtotal		52.9	
Operation period				
2.1	Solid wastes	Domestic solid waste collection bins	2	20 Nos.
2.2	Noise management	Aluminum alloy insulating glass window	/	Already included in construction investment
2.3	Exhaust gas management	Ventilation fans	/	Already included in construction investment
2.4	Wastewater management	In-building wastewater collection system	/	Already included in construction investment
2.5	Subtotal		2	
3	Overheads	Supervision cost	10	Construction period supervision
		Management and labor cost	3	Labor costs and expenses
		Equipment procurement and material cost	3	Office expenses during management
4	Monitoring cost	Indoor air quality monitoring	2	
		Operation period wastewater quality monitoring	2.5	
		Operation period noise monitoring	1.5	
5	Environmental protection knowledge training		4.6	
6	Contingencies		8.15	Calculated at a percentage of 10%
Total			89.65	

10.5 Summary of Environmental management Cost

As shown in Table 10-5, the total cost of environmental management amounts to a total of 4.6125 million yuan.

Table 10-5 Summary of Project Environmental Management Budget

Name of Project	Environmental Monitoring Cost (CNY10000)	Environmental Mitigation Measures (CNY10000)	Training Cost (CNY10000)	Contingency (CNY10000)	Total (CNY10000)
World Bank Loan Gansu TVET Project	32.5	368.5	18.5	41.75	459.25

11. Public Participation and Information Disclosure

11.1 Objectives of Public Participation & Information Disclosure

Public participation in the EIA process aims to improve the quality of EIA and provide more information and suggestions to make the EIA of a construction project more democratic and public, enable the public directly or indirectly connected to the project to participate in the EIA and assure the transparency and credibility of EIA decisions and provide the public with a chance of expressing their opinions and views to make the EIA more robust and fair.

Public participation is an important part of the EIA process and also an effective approach to sound and scientific decision. Public participation in a construction project is an important approach to improving bidirectional communications between the project implementation agency, the EIA agency and the general public. Through extensive public participation, the public directly or indirectly affected by the construction of a project is provided with a chance to fully understand the environmental impacts likely to arise from, the related environmental protection and mitigation measures as well as the economic benefits and social benefits to be brought by the construction project; in addition, extensive public participation enables the public to actively give feedbacks and opinions, contribute suggestions and advices and jointly identify solutions to problems existing in the project so as to minimize the environmental impacts, avoid pollution disputes arising in the construction and operation period of the project and realize better coordination between development and environmental protection. The key objectives of public participation are:

(1) Through public participation, public opinions are analyzed and incorporated in the environmental protection management measures and also used as a guide to future actions in the construction process of the Project.

(2) Through public participation, a bridge of bidirectional communication between the public and the implementation agency, a detailed introduction about the project overview, pollution condition, management measures, EIA prediction results are given to the public and public opinions and suggestions are fed back to the implementation agency as a basis of program revision.

(3) Through public participation, public attitudes and opinions on the Project are known and a basis is determined for safeguarding the vital interests of the public; feasibility recommendations are adequately considered in the EIA process; and public concerns due to lack of communication are reduced and adverse impacts on public benefits minimized, with necessary compensation provided.

(4) Post-EIA appraisal mainly relies on public surveillance. Active public participation, an important component of the environmental management mechanism, facilitates protection of ecological environment, promotion of the Project's environmental and economic benefits and improvement of environmental quality and assures smooth implementation of the sustainable development strategy.

11.2 Identification of Stakeholders

The World Bank initiated the concept of "stakeholder" and defined stakeholder groups in its assistance strategy. Stakeholders refer to "those affecting the actions and policies of and affected by the World Bank" (World Bank 1994:1). Based on the characteristics of impacts generated by the civil works of this World Bank Project, the stakeholders related to the Project are grouped in this EIA as follows: (1) students and faculty of the project implementation schools; (2) individuals and social groups outside the schools; (3) government departments and related organizations.

(1) Students and faculty of the project implementation schools

Stakeholders most directly connected to the Project are the students and faculty of the 4 schools. Since the civil works of the Project will be directly constructed in campus, noises, dust, wastewater, construction solid wastes and construction traffic safety issues generated by the construction activities will generate direct impacts on school students and faculty. Therefore, this EIA, in the public participation process, will focus on the detailed study of the opinions and requests of this stakeholder group on environmental management in the construction period and the operation period and incorporate them into this EMP.

(2) Individuals and social groups outside the schools

The participants of public participation are mainly the public directly or indirectly affected by the Project. Apart from the students and faculty of the 4 schools, the general public outside the schools (including local residents, schools, hospitals and social groups, etc.) are also affected by the project construction to different degrees. Since this part of the public are distributed in a large geographical scope and affected to different degrees, it is necessary to identify this part of the affected public to make the public participation more pertinent.

Based on the characteristics of the impacts of construction projects, the impacts of this World Bank Loan Project mainly cover the environmental and social impacts in the construction period and the operation period. The scope and degree of such impacts are described in detail in Table 11-1 and Table 11-2.

Table 11-1 Analysis of Degree of Public Impacts in the Construction Period

Object Impact Distance	Residents	Hospitals	Schools	Social groups
50m	Large	Large	Large	Large
50-100m	Medium	Medium	Medium	Medium
>100m	Small	Small	Small	Small
Transportation route	Small	Small	Small	Small

Table 11-2 Analysis of Degree of Public Impacts in the Operation Period

Objects Impacts Distance	Residents	Hospitals	Schools	Social groups
50m	Small	Small	Small	Small
50-100m	Small	Small	Small	Small
>100m	Small	Small	Small	Small

It is known from the tables above that it is in the construction period that a Project generates its largest impacts, in particular on those in a distance of less than 50m from the construction sites, followed by those in a distance of 50m to 100m. Therefore, the key objects of public participation are the affected individuals and social groups outside the project schools in a distance of 100m from the construction sites of the Project, including local residents, hospitals and social groups. Although the public outside the 100m distance and along the transportation routes are subject to relatively smaller impacts, they are still affected by the project construction and their opinions and requests will also be considered in this public participation survey.

The aforesaid survey objects are mainly individuals at and above the age of 18 with different occupations, different educational backgrounds and different age groups. The role that women play in environmental protection will also be considered.

(3) Government Departments and Related Organizations

During the construction of the Project, environmental management, solid waste treatment and supportive wastewater treatment in the construction period and the operation period will be involved, making it necessary to consult the opinions and requirements of related departments and organizations. Table 11-3 shows the government departments and related organizations to

be consulted under the Project.

Table 11-3 List of Government Departments and Related Organizations to be Consulted under the Project

Name of department	Relation with the Project
Local government	Competent authority of the administrative district that the project schools belong to
Local education bureau	Competent authority of each project school
Local EPB	Environmental management authority in the construction period and the operation period
Local environmental sanitation bureau	City administration and solid waste disposal
WWTP	Organization providing supports in wastewater treatment in the construction period

11.3 Methods and Contents of Public Participation

According to the requirements of the Law of the People’s Republic of China on Environmental Impact Assessment, the Provisional Methods of Public Participation in Environmental Impact Assessment published by Ministry of Environmental Protection and the Operational Policy of the World Bank (OP4.01), two rounds of public consultation and information disclosure activities were conducted in our EIA process, with Round 1 carried out after identification of environmental issues and before finalization of the terms of reference of EIA and Round 2 in the finalization stage of Draft EIA Report.

11.3.1 Methods

The methods of public participation and consultation mainly include:

- (1) Posting announcements around project schools;
- (2) Visiting local residents around project schools;
- (3) Issuing public survey questionnaires;
- (4) Inviting public representatives, teacher and student representatives and NGO representatives to discussions;

11.3.2 Contents

- (1) Posting announcements

To introduce to the public around the project schools about the basic information of the Project as well as the environmental impacts likely to arise in the construction period and operation period of the Project; to inform the public of impacts that the Project might generate

on the environment and on their daily life, to announce contact information for receiving public consultations and feedbacks;

(2) Discussions and interviews

Such discussions mainly aim to introduce to the participants about the progress of project construction and key contents of environmental protection and listen to their opinions and suggestions in these regards.

(3) Questionnaires

Main contents of the questionnaires of the Project are shown in Attached Table 3.

11.4 Public Opinions and Suggestions

11.4.1 Summary of Public Survey on EMP

See Table 11-4 for details of public surveys carried out on the environmental management plan.

11.4.2 Summary of Public Survey on Social Impact Assessment

See Table 11-5 for details of public surveys carried out on the social impact assessment.

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Table 11-4 Methods and Contents of EMP Public Consultation and Participation

Stage	Time	Method	Location	Objects of Consultation	Contents
Gansu Senior Technical School of Mechanics					
1 st Round Public Participation and Information Disclosure	March 30, 2016 - April 13, 2016	Posting announcements	Sensitive protection targets such as project school gates, affected residential areas, hospitals, schools	Stakeholders	Public Consultation Information Disclosure of World Bank Loan Gansu TVET Project includes project construction site, construction component, environmental impacts likely to arise in the construction period and operation period, contact information and feedback channels of implementation agency and EIA agency
	March 30, 2016	Site investigation	Project schools, Municipal EPB	School members, PMO responsible person	Investigations are carried out in local environmental conditions to find out facts about the existence of WWTPs, final destination of domestic solid wastes, disposal requirement of construction solid wastes, sensitive points in the neighborhood and stakeholders' environmental concerns and their opinions and requirements on the Project.
	March 30, 2016	Discussions	Project school conference room	EPB, EB, Resident Committee, School PMO responsible persons and teacher and student representatives	Local environmental management requirements are studied; the basic information and possible impacts of the Project are introduced; participants are consulted about their opinions and requirements.
	March 30, 2016 - April 8, 2016	Questionnaire survey	Affected residential areas, hospitals, schools, NGOs around project sites	Stakeholders	Public consultation questionnaire (individuals) and (units / groups) of World Bank Loan Gansu TVET Project including contents of project construction site, construction component, environmental impacts likely to arise in the construction period and operation period, contact information and feedback channels of implementation agency and EIA agency
2 nd Round Public Participation and Information Disclosure	Aug. 18, 2016	Website information disclosure	Website of Gansu Institute of Mechanical & Electrical Engineering: http://www.gsjdxy.com/Article/tzgg/201608/5221.html	The general public	Project introduction, key EIA conclusions, notice on public participation invitation, contact information, full document download link of the Environmental and Social Management Plant of World Bank Loan Gansu TVET Project (Chinese version)
	Sept. 16, 2016	Posting announcements	School gate and bulletin board	Project school teachers and students and adjacent public	Notice on EMP Full Document Disclosure and Public Participation Invitation of World Bank Loan Gansu TVET Project includes project name, project introduction, key environmental protection measures and conclusions, contact person and information feedback channels.
	Sept. 16,	Discussions	Multimedia classroom	Students and teachers	ESMP is distributed to meeting participants; Head of school PMO

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Stage	Time	Method	Location	Objects of Consultation	Contents
	2016		and teaching research office		introduces the basic information of the Project; EIA Team Members introduce environmental impacts and mitigation measures and discuss with participants about environmental protection measures in ESMP and propose specific amendments.
Lanzhou University of Arts and Science					
1 st Round Public Participation and Information Disclosure	Apr. 1, 2016 - Apr. 15, 2016	Posting announcements	Sensitive protection targets such as project school gates, affected residential areas, hospitals, schools	Stakeholders	Public Consultation Information Disclosure of World Bank Loan Gansu TVET Project includes project construction site, construction component, environmental impacts likely to arise in the construction period and operation period, contact information and feedback channels of implementation agency and EIA agency
	April 1, 2016	Site investigation	Project school	Project school PMO members	Investigations are carried out in local environmental conditions to find out facts about the existence of WWTPs, final destination of domestic solid wastes, disposal requirement of construction solid wastes, sensitive points in the neighborhood and stakeholders' environmental concerns and their opinions and requirements on the Project.
	April 1, 2016	Interview	Project schools and affected residential areas, hospitals, schools, NGOs in the neighborhood	Project school teachers and students and local residents, NGO representatives	The basic information and possible environmental impacts of the Project are introduced to the public; the local public around the project schools are consulted to collect and summarize their attitude toward and opinions on the Project; questionnaires are distributed on campus to consult school faculty and students and the public on campus about their opinions and requirements on school construction.
	April 1, 2016 - April 10, 2016	Questionnaire survey	Affected residential areas, hospitals, schools, NGOs around project sites	Stakeholders	Public consultation questionnaire (individuals) and (units / groups) of World Bank Loan Gansu TVET Project including contents of project construction site, construction component, environmental impacts likely to arise in the construction period and operation period, contact information and feedback channels of implementation agency and EIA agency
2 nd Round Public Participation	Aug. 15, 2016	Website information disclosure	Website of Lanzhou University of Arts and Science: http://news.luas.edu.cn/news/7986.html	The general public	Project introduction, key EIA conclusions, notice on public participation invitation, contact information, full document download link of the Environmental and Social Management Plan of World Bank Loan Gansu TVET Project (Chinese version)
	Sept. 20, 2016	Posting announcements	School gate, library, teaching building, staff	In-school teachers and students and	Notice on EMP Full Document Disclosure and Public Participation Invitation of World Bank Loan Gansu TVET

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Stage	Time	Method	Location	Objects of Consultation	Contents
			dormitory building, residential areas in the neighborhood	adjacent public	Project includes project name, project introduction, key environmental protection measures and conclusions, contact person and information feedback channels.
	Sept. 20, 2016	Discussions	Conference Room of Provincial Art School	Art School students and teachers, adjacent shops	ESMP is distributed to meeting participants; Head of school PMO introduces the basic information of the Project; EIA Team Members introduce environmental impacts and mitigation measures and discuss with participants about environmental protection measures in ESMP and propose specific amendments.
Gansu Vocational College of Energy and Chemical; Gansu Finance and Trade Vocational College					
1 st Round Public Participation and Information Disclosure	April 2, 2016 - April 18, 2016	Posting announcements	Sensitive protection targets such as project school gates, affected residential areas, hospitals, schools	Stakeholders	Public Consultation Information Disclosure of World Bank Loan Gansu TVET Project includes project construction site, construction component, environmental impacts likely to arise in the construction period and operation period, contact information and feedback channels of implementation agency and EIA agency
	Nov. 30, 2020				
	April 2, 2016 - Nov. 30, 2020	Site investigation	Project school, LND TVET Park	LND TVET Park, LND EPB main responsible persons and school PMO members	Investigations are carried out in local environmental conditions to find out facts about the existence of WWTPs, final destination of domestic solid wastes, disposal requirement of construction solid wastes, sensitive points in the neighborhood and stakeholders' environmental concerns and their opinions and requirements on the Project.
	Nov. 30, 2020				
	April 2, 2016 - Nov. 30, 2020	Interview	Adjacent residential areas, existing campuses	Adjacent resident representatives and old campus teacher and student representatives	The basic information and possible environmental impacts of the Project are introduced to the public; the local public around the project schools are consulted to collect and summarize their attitude toward and opinions on the Project; questionnaires are distributed on campus to consult school faculty and students and the public on campus about their opinions and requirements on school construction.
	Nov. 30, 2020				
	April 2, 2016 - April 13, 2016 - Nov. 30, 2020	Questionnaire survey	Affected residential areas, hospitals, schools, NGOs around project sites	Stakeholders	Public consultation questionnaire (individuals) and (units / groups) of World Bank Loan Gansu TVET Project including contents of project construction site, construction component, environmental impacts likely to arise in the construction period and operation period, contact information and feedback channels of implementation agency and EIA agency
	Nov. 30, 2020		Teachers and students		

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Stage	Time	Method	Location	Objects of Consultation	Contents
	2020		impacted by the project		
2 nd Round Public Participation and Information Disclosure	Aug. 18, 2016	Website information disclosure	Website of Gansu Vocational College of Energy and Chemical: http://www.gsnyc.edu.cn/html/news/gonggao/565.html	The general public	Project introduction, key EIA conclusions, notice on public participation invitation, contact information, full document download link of the Environmental and Social Management Plan of World Bank Loan Gansu TVET Project (Chinese version)
	Dec. 18, 2020		Official Website of Gansu Vocational College of Energy and Chemical Industry https://www.gsnh.edu.cn/Info/1/17463/index.aspx		
	Aug. 16, 2016	Website information disclosure	Website of Gansu Finance and Trade Vocational College: http://www.gscmxy.com/index.php?_m=mod_article&_a=article_content&article_id=458		
	Dec. 24, 2020		Official Website of Gansu Finance and Trade Professional College https://www.gscmxy.edu.cn/shjggg/1351.jhtml		
	Sept. 13, 2016	Posting announcements	Main Gate of Gansu Vocational College of Energy and Chemical, adjacent hospitals, residential areas	Project school teachers and students and adjacent public	Notice on EMP Full Document Disclosure and Public Participation Invitation of World Bank Loan Gansu TVET Project includes project name, project introduction, key environmental protection measures and conclusions, contact person and information feedback channels.
	Dec. 18, 2020				
	Sept. 22, 2016	Posting announcements	Main Gate of Gansu Finance and Trade Vocational College, adjacent hospitals,	Project school teachers and students and adjacent public	
	Dec. 24,				

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Stage	Time	Method	Location	Objects of Consultation	Contents
	2020		residential areas		
	Sept. 13, 2016	Discussions	Conference Room of Provincial Vocational College	In-school faculty representatives, student representatives, adjacent public representatives	ESMP is distributed to meeting participants; Head of school PMO introduces the basic information of the Project; EIA Team Members introduce environmental impacts and mitigation measures and discuss with participants about environmental protection measures in ESMP and propose specific amendments.
	Sept. 22, 2016	Discussions	3 rd Floor Multimedia Classroom of Provincial Commerce & Trade School	In-school student representatives, teacher representatives	
	Dec. 18, 2020	Discussions	Conference Room of Gansu Vocational College of Energy and Chemical Industry	In-school student representatives, teacher representatives	
		Discussions	Conference Room of Gansu Finance and Trade Professional College	In-school student representatives, teacher representatives	

Table 11-5 Methods and Contents of Public Consultation and Participation in Social Impact Assessment

Method	Object	Content
Focus group discussion	School teachers and students	Key contents of teacher interviews include school-industry partnership, teaching resources, teacher training, social service, infrastructure, secondary and tertiary TVET integration, etc.; student interviews mainly focus on students' level satisfaction about schools, specialties, fields of employment, school-industry partnership, etc.
Key informant interview	Key informants in school teachers, students, administration staff, government officials, female teachers and students, poverty-stricken students	Information is collected by means of meetings, job interviews and household interviews to obtain more data related to the Project SIA and explore internal information.
Questionnaire	Teachers, students, parents	Questionnaires are used to find out the different attitudes and the different interest demands of different stakeholders to the Project to provide important references needed for correct planning, content design and social assessment of the Project.

11.4.3 Public Consultation Sites

The following photographs show the sites of public consultation carried out as a part of the environmental and social impact assessment process of the World Bank Loan Project.



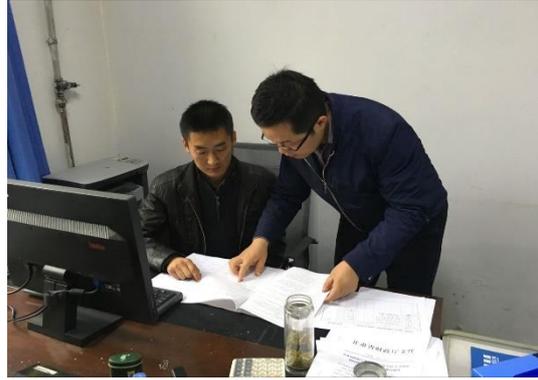
Discussions at Lanzhou University of Arts and Science



Teacher Discussions at Gansu Industrial and Commercial School



Community Interviews at Gansu Senior Technical School of Mechanics



Government Interviews at Gansu Senior Technical School of Mechanics



Household Interviews at Gansu Senior Technical School of Mechanics



Private Business Interviews at Gansu Senior Technical School of Mechanics



Student Discussions at Gansu Economic School



Teacher Discussions at Gansu Finance and Trade School

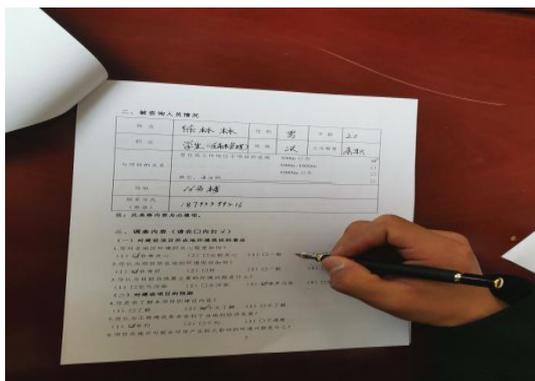


Discussions at Gansu Finance and Trade Professional College

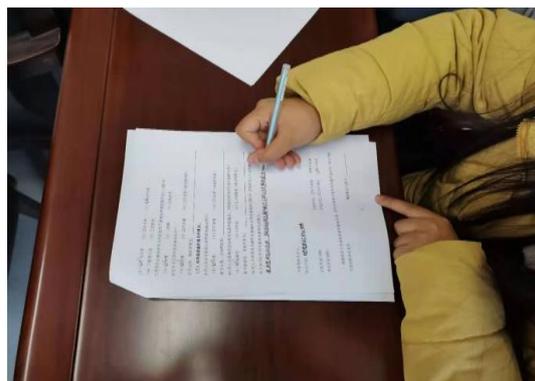


Discussions at Gansu Vocational College of Energy and Chemical Industry

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan



Questionnaire Completion at Gansu Finance and Trade Professional College



Questionnaire Completion at Gansu Vocational College of Energy and Chemical Industry

11.4.4 Statistics and Analysis of Public Participation Results

11.4.4.1 Distribution of Questionnaires and Structure of Respondents

(1) Recovery Rate of Questionnaires

In the process of public participation survey, adequate consideration was given to opinions and suggestions of respondents of different age groups, different professions and different educational background and serious attention was paid to the rationality of male-female proportion in the survey to give equal consideration to female rights and interests. In this public participation survey, totally 400 questionnaires were distributed, with 63, 85, 79, and 67 individual questionnaires distributed respectively in Gansu Finance and Trade Vocational College, Gansu Vocational College of Energy and Chemical, Gansu Senior Technical School of Mechanics and Lanzhou University of Arts and Science and 7 and 4 organization questionnaires distributed respectively in Gansu Finance and Trade Vocational College and Gansu Senior Technical School of Mechanics. The questionnaire recovery rate and effective questionnaire rate both reached 100%.

(2) Respondent Structure Analysis

The questionnaire survey covers respondents of different age groups, different genders and different educational backgrounds and includes both directly affected persons and indirectly affected persons. The great majority of the respondents are Han in terms of ethnic group.

Among the respondents in Gansu Finance and Trade Vocational College, 46% are male and 54% are female; the percentages of male and female respondents are respectively 76% and 24% in Gansu Vocational College of Energy and Chemical, 67% and 33% in Gansu Senior Technical School of Mechanics and 1% and 99% in Lanzhou University of Arts and Science.

70%, 89% and 82% of the respondents respectively in Gansu Finance and Trade Vocational College, Gansu Vocational College of Energy and Chemical, Gansu Senior Technical School of Mechanics and Lanzhou University of Arts and Science are young and middle-aged people in the age group of 18 to 60 years old. Showing the strongest concern about the project construction and environmental condition, the young and middle-aged people will be active supporters and participants in construction of the Project and environmental protection.

In terms of educational background of the respondents, in Gansu Finance and Trade Vocational College, 2%, 66% and 32% of the respondents respectively have an educational background below the level of secondary specialized school, at the level of secondary specialized school / high school and at and above the level of university; in Gansu Vocational College of Energy and Chemical, 74% of the respondents have an education background of

secondary specialized school / senior middle school and the remaining 26% are at and above the level of university; in Gansu Senior Technical School of Mechanics, 7%, 13%, 46% and 34% of the respondents respectively have an educational background below the level of secondary specialized school, at the level of secondary specialized school / senior middle school, at the level of college and at and above the level of university; in Lanzhou University of Arts and Science, the great majority of the respondents are in-school students and teachers in terms of occupation and the respondents have background of secondary and tertiary education and certain level of awareness of environmental protection.

In terms of the relation between respondents and the Project, 46%, 4% and 50% of the respondents in Gansu Finance and Trade Vocational College live or work at a place located in a distance of less than 1km, 1km to 2km and more than 2km from the project site respectively; 64%, 7% and 29% of the respondents in Gansu Vocational College of Energy and Chemical live or work at a place less than 1km, 1km to 2km and more than 2km away from the project site; in Gansu Senior Technical School of Mechanics, 54%, 9% and 37% of the respondents live or work at a place less than 1km, 1km to 2km and more than 2km away from the project site; in Lanzhou University of Arts and Science, 99%, 0% and 1% of the respondents live or work at a place less than 1km, 1km to 2km and more than 2km away from the project site.

11.4.4.2 Questionnaire Statistics and Analysis for Gansu Finance and Trade Vocational College

Table 11-6 Structural Statistics of Consultation Objects for Gansu Finance and Trade Vocational College

	Category	Number of persons	Percentage (%)
Age	Below 18 years old	17	27%
	18-50 years old	46	73%
Gender	Male	29	46%
	Female	34	54%
Ethnic group	Han	54	86%
	Hui	4	6%
	Tibetan	3	5%
	Others	2	3%
Educational background	Below secondary specialized school	1	2%
	Secondary specialized school	42	66%
	At and above the level of university	20	32%
Occupation	Student	43	68%
	Teacher	20	32%
Relation with the Project	Less than 1km	29	46%
	1k to 2km	3	4%
	More than 2km	31	50%

**Table11-7 Statistics of Individual Questionnaire Results for Gansu Finance and Trade
Vocational College**

Questions	Answers	Number of persons	Percentage
1. What's your level of concern about local environment?	(1) Very high (2) Relatively high (3) Average (4) Zero	27 33 3 0	43% 52% 5% 0%
2.How do you evaluate the environmental condition of the project area?	(1) Very good (2) Fine (3) Average (4) Poor	14 28 19 2	22% 45% 30% 3%
3.What do you think is the most serious environmental problem in the project area?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution	29 11 11 12	46% 17.5% 17.5% 19%
4.Do you know about the components of the Project?	(1) Yes (2) Not very well (3) No	46 16 1	73% 25% 2%
5.Do you think the project will benefit local economic development?	(1) Yes (2) No (3) I have no idea.	58 4 1	92% 6% 2%
6.What do you think is the environmental problem that will produce significant impact on yourself after the Project is implemented?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution (5) No impact	13 6 10 13 27	19% 9% 14% 19% 39%
7.What impacts will the project implementation produce on the environmental problems that you are not satisfied with in the project area?	(1) Aggravated (2) Mitigated (3) No impact	5 29 29	8% 46% 46%
8.What's your general attitude toward the Project?	(1) Supportive (2) I don't care. (3) Not supportive	63 0 0	100% 0% 0%
9.Do you think the environmental protection measures proposed under the Project are reasonable?	(1) Reasonable (2) Not sure (3) Unreasonable	61 2 0	97% 3% 0%
10. Can you accept the negative environmental impacts of the Project after the environmental protection measures are taken under the proposed project?	(1) Yes, I can. (2) I am not sure. (3) No, I cannot.	45 16 2	72% 25% 3%

**Table11-8 Statistics of Group questionnaire Results for Gansu Finance and Trade
Vocational College**

Questions	Answers	Number of persons	Percentage
1. What's your level of concern about local environment?	(1) Very high (2) Relatively high (3) Average (4) Zero	6 1 0 0	86% 14% 0% 0%

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

2.How do you evaluate the environmental condition of the project area?	(1) Very good (2) Fine (3) Average (4) Poor	1 3 2 1	14% 43% 29% 14%
3.What do you think is the most serious environmental problem in the project area?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution	5 1 0 1	72% 14% 0% 14%
4.Do you know about the components of the Project?	(1) Yes (2) Not very well (3) No	7 0 0	100% 0% 0%
5.Do you think the project will benefit local economic development?	(1) Yes (2) No (3) I have no idea.	6 0 1	86% 0% 14%
6.What do you think is the environmental problem that will produce significant impact on yourself after the Project is implemented?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution (5) No impact	4 1 0 0 2	58% 14% 0% 0% 28%
7.What impacts will the project implementation produce on the environmental problems that you are not satisfied with in the project area?	(1) Aggravated (2) Mitigated (3) No impact	0 5 2	0% 71% 29%
8.What's your general attitude toward the Project?	(1) Supportive (2) I don't care. (3) Not supportive	6 1 0	86% 14% 0%
9.Do you think the environmental protection measures proposed under the Project are reasonable?	(1) Reasonable (2) Not sure (3) Unreasonable	6 1 0	86% 14% 0%
10. Can you accept the negative environmental impacts of the Project after the environmental protection measures are taken under the proposed project?	(1) Yes, I can. (2) I am not sure. (3) No, I cannot.	3 3 1	43% 43% 14%

1) It is known from statistical analysis of the results of individual questionnaires that:

①Environmental conditions of the project area

The majority of the respondents participating in the questionnaire survey are concerned about the local environmental quality conditions, with respectively 43%, 52% and 5% being highly concerned, relatively concerned and averagely concerned. 22%, 45% and 30% of the respondents respectively evaluate the local environmental quality as very good, fine and average. Air pollution is deemed as the most serious environmental problem in the project area by 46% of the respondents; water pollution by 17.5%, noise pollution by 17.5% and solid waste pollution by 19%.

②Expectations on the construction project

Results of public participation survey indicate that 73% of the public know about the

components of the Project while the remaining 25% do not. The majority of the respondents think that the Project will benefit local economic development. Regarding the environmental problem that will produce relatively significant impact after the Project is implemented, 19%, 9%, 14% and 19% of the respondents choose air pollution, water pollution, noise pollution and solid waste pollution respectively and the remaining 39% choose no impact. 46% of the respondents think that ,thanks to the project implementation, the local environmental problems in the project area will be mitigated and the remaining 46% think no impact will be produced. 8% think it may be worsened: It is known from our return visits that they hold the dust and noises generated from the construction may impact the local environment. We have made detailed interpretations on the preventive measures and management requirements on such problems, and they finally understood and accepted. The public in the neighborhood show a very high support rate towards the Project, with 100% of the respondents supporting the construction of the Project.

③ Comments and suggestions on environmental protection measures

Results of public participation survey show that 97% of the public think that the environmental protection measures proposed under the Project are reasonable and the remaining 3% not sure. The majority of the respondents indicated that they can accept the negative environmental impacts of the Project after the environmental protection measures are taken.

2) Statistical analysis of the group questionnaire survey results

Totally 7 group questionnaires were issued and 7 recovered. The surveyed groups are Gansu Economic and Trade School, Gansu Bank School, Gansu Commercial School, etc. Supportive to the construction of the Project, the surveyed groups believe that the Project will be able to drive local economic growth. In addition, a brief introduction about the Project and the possible environmental problems was made to the responsible persons of the surveyed groups. Showing sincere concerns about the Project, the surveyed groups, in general, believe that the various problems existing in the construction process of the Project should be well addressed based on the specific circumstances of the project schools so as to assure normal construction of the Project in the true sense.

11.4.4.3 Questionnaire Statistics and Analysis for Gansu Vocational College of Energy and Chemical

Table 11-9 Structural Statistics of Consultation Objects for Gansu Vocational College of Energy and Chemical

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Age	Category	Number of persons	Percentage (%)
	Below 18 years old	7	8%
18-50 years old	76	90%	
Above 50 years old	2	2%	
Gender	Male	65	76%
	Female	20	24%
Ethnic group	Han	80	94%
	Others	5	6%
Educational background	Secondary specialized school	63	74%
	At and above the level of university	22	26%
Occupation	Student	63	74%
	Teacher	22	26%
Relation with the Project	Less than 1km	54	64%
	1k to 2km	6	7%
	More than 2km	25	29%

Table 11-10 Statistics of Individual Questionnaire Results for Gansu Vocational College of Energy and Chemical

Questions	Answers	Number of persons	Percentage
1. What's your level of concern about local environment?	(1) Very high	50	59%
	(2) Relatively high	34	40%
	(3) Average	1	1%
	(4) Zero	0	0%
2.How do you evaluate the environmental condition of the project area?	(1) Very good	11	13%
	(2) Fine	34	40%
	(3) Average	36	42%
	(4) Poor	4	5%
3.What do you think is the most serious environmental problem in the project area?	(1) Air pollution	49	58%
	(2) Water pollution	1	1%
	(3) Noise pollution	25	29%
	(4) Solid waste pollution	10	12%
4.Do you know about the components of the Project?	(1) Yes	53	62%
	(2) Not very well	29	34%
	(3) No	3	4%
5.Do you think the project will benefit local economic development?	(1) Yes	80	94%
	(2) No	0	0%
	(3) I have no idea.	5	6%
6.What do you think is the environmental problem that will produce significant impact on yourself after the Project is implemented?	(1) Air pollution	25	23%
	(2) Water pollution	9	8%
	(3) Noise pollution	34	32%
	(4) Solid waste pollution	8	8%
	(5) No impact	31	29%
7.What impacts will the project implementation produce on the environmental problems that you are not satisfied with in the project area?	(1) Aggravated	14	17%
	(2) Mitigated	42	49%
	(3) No impact	29	34%

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

8.What's your general attitude toward the Project?	(1) Supportive (2) I don't care. (3) Not supportive	81 4 0	95% 5% 0%
9.Do you think the environmental protection measures proposed under the Project are reasonable?	(1) Reasonable (2) Not sure (3) Unreasonable	76 9 0	89% 11% 0%
10. Can you accept the negative environmental impacts of the Project after the environmental protection measures are taken under the proposed project?	(1) Yes, I can. (2) I am not sure. (3) No, I cannot.	65 20 0	76% 24% 0%

It is known from statistical analysis of the results of individual questionnaires that:

①Environmental condition of the project area

The majority of the respondents participating in the questionnaire survey are concerned about the local environmental quality conditions, with respectively 59%, 40% and 1% being highly concerned, relatively concerned and averagely concerned. 13%, 40% and 42% of the respondents respectively evaluate the local environmental quality as very good, fine and average. Air pollution is deemed as the most serious environmental problem in the project area by 58% of the respondents; water pollution by 1%, noise pollution by 29% and solid waste pollution by 12%.

②Expectations on the construction project

Results of public participation survey indicate that 62% of the public know about the components of the Project while 34% do not. The majority of the respondents think that the Project will benefit local economic development. Regarding the environmental problem that will produce relatively significant impact after the Project is implemented, 23%, 8%, 32% and 8% of the respondents choose air pollution, water pollution, noise pollution and solid waste pollution respectively and the remaining 29% choose no impact. 49% of the respondents think that, thanks to the project implementation, the local environmental problems in the project area will be mitigated and the 34% think no impact will be produced. The public in the neighborhood show a very high support rate towards the Project, with 95% of the respondents supporting the construction of the Project.

③Comments and suggestions on environmental protection measures

Results of public participation survey show that 89% of the public think that the environmental protection measures proposed under the Project are reasonable and the remaining 11% not sure. The majority of the respondents indicated that they can accept the negative environmental impacts of the Project after the environmental protection measures are

taken.

11.4.4.4 Questionnaire Statistics and Analysis for Gansu Senior Technical School of Mechanics

Table 11-11 Structural Statistics of Consultation Objects for Gansu Senior Technical School of Mechanics

Age	Category	Number of persons	Percentage (%)
	18-50 years old	77	97%
Above 50 years old	2	3%	
Gender	Male	53	67%
	Female	26	33%
Ethnic group	Han	74	94%
	Hui	5	6%
	Others	0	0%
Educational background	Below secondary specialized school	8	10%
	Secondary specialized school / senior middle school	8	10%
	College	36	46%
	At and above the level of university	27	34%
Occupation	Student	17	22%
	Teacher	26	33%
	Worker	12	15%
	Others	24	30%
Relation with the Project	Less than 1km	43	54%
	1k to 2km	7	9%
	More than 2km	29	37%

Table 11-12 Statistics of Individual Questionnaire Results for Gansu Senior Technical School of Mechanics

Questions	Answers	Number of persons	Percentage
1. What's your level of concern about local environment?	(1) Very high	59	75%
	(2) Relatively high	20	25%
	(3) Average	0	0%
	(4) Zero	0	0%
2. How do you evaluate the environmental condition of the project area?	(1) Very good	46	58%
	(2) Fine	19	24%
	(3) Average	14	18%
	(4) Poor	0	0%
3. What do you think is the most serious environmental problem in the project area?	(1) Air pollution	29	37%
	(2) Water pollution	15	19%
	(3) Noise pollution	21	27%
	(4) Solid waste pollution	14	17%
4. Do you know about the components of the Project?	(1) Yes	65	82%
	(2) Not very well	14	18%
	(3) No	0	0%

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

5.Do you think the project will benefit local economic development?	(1) Yes (2) No (3) I have no idea.	75 0 4	95% 0% 5%
6.What do you think is the environmental problem that will produce significant impact on yourself after the Project is implemented?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution (5) No impact	13 7 12 1 46	16% 9% 15% 1% 59%
7.What impacts will the project implementation produce on the environmental problems that you are not satisfied with in the project area?	(1) Aggravated (2) Mitigated (3) No impact	5 19 55	6% 24% 70%
8.What's your general attitude toward the Project?	(1) Supportive (2) I don't care. (3) Not supportive	77 2 0	97% 3% 0%
9.Do you think the environmental protection measures proposed under the Project are reasonable?	(1) Reasonable (2) Not sure (3) Unreasonable	75 4 0	95% 5% 0%
10. Can you accept the negative environmental impacts of the Project after the environmental protection measures are taken under the proposed project?	(1) Yes, I can. (2) I am not sure. (3) No, I cannot.	77 2 0	97% 3% 0%

Table 11-13 Statistics of Group questionnaire Results for Gansu Senior Technical School of Mechanics

Questions	Answers	Number of persons	Percentage
1. What's your level of concern about local environment?	(1) Very high (2) Relatively high (3) Average (4) Zero	4 0 0 0	100% 0% 0% 0%
2.How do you evaluate the environmental condition of the project area?	(1) Very good (2) Fine (3) Average (4) Poor	3 1 0 0	75% 25% 0% 0%
3.What do you think is the most serious environmental problem in the project area?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution	0 3 1 0	0% 75% 25% 0%
4.Do you know about the components of the Project?	(1) Yes (2) Not very well (3) No	4 0 0	100% 0% 0%
5.Do you think the project will benefit local economic development?	(1) Yes (2) No (3) I have no idea.	4 0 0	100% 0% 0%
6.What do you think is the environmental problem that will produce significant impact on yourself after the Project is implemented?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution (5) No impact	0 0 0 0 4	0% 0% 0% 0% 100%

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

7. What impacts will the project implementation produce on the environmental problems that you are not satisfied with in the project area?	(1) Aggravated (2) Mitigated (3) No impact	0 1 3	0% 25% 75%
8. What's your general attitude toward the Project?	(1) Supportive (2) I don't care. (3) Not supportive	4 0 0	100% 0% 0%
9. Do you think the environmental protection measures proposed under the Project are reasonable?	(1) Reasonable (2) Not sure (3) Unreasonable	4 0 0	100% 0% 0%
10. Can you accept the negative environmental impacts of the Project after the environmental protection measures are taken under the proposed project?	(1) Yes, I can. (2) I am not sure. (3) No, I cannot.	4 0 0	100% 0% 0%

1) It is known from statistical analysis of the results of individual questionnaires that:

① Environmental condition of the project area

The majority of the respondents participating in the questionnaire survey are concerned about the local environmental quality conditions, with respectively 75% and 25% being highly concerned and relatively concerned. 58%, 24% and 18% of the respondents respectively evaluate the local environmental quality as very good, fine and average. Air pollution is deemed as the most serious environmental problem in the project area by 37% of the respondents; water pollution by 19%, noise pollution by 27% and solid waste pollution by 17%.

② Expectations on the construction project

Results of public participation survey indicate that 82% of the public know about the components of the Project while 18% do not. The majority of the respondents think that the Project will benefit local economic development. Regarding the environmental problem that will produce relatively significant impact after the Project is implemented, 16%, 9%, 15% and 1% of the respondents choose air pollution, water pollution, noise pollution and solid waste pollution respectively and the remaining 59% choose no impact. 24% of the respondents think that, thanks to the project implementation, the local environmental problems in the project area will be mitigated and 70% think no impact will be produced. The public in the neighborhood show a very high support rate towards the Project, with 97% of the respondents supporting the construction of the Project.

③ Comments and suggestions on environmental protection measures

Results of public participation survey show that 95% of the public think that the environmental protection measures proposed under the Project are reasonable and the remaining 5% not sure. The majority of the respondents indicated that they can accept the

negative environmental impacts of the Project after the environmental protection measures are taken.

2) Statistical analysis of the group questionnaire survey results

Totally 4 group questionnaires were issued and 4 recovered. The surveyed groups are the China Unicom, TianshuiQinzhou District Taxation Bureau, Jiahui Supermarket and Xishili Community Office. Supportive to the construction of the Project, the surveyed groups believe that the Project will be able to drive local economic growth.

11.4.4.5 Questionnaire Statistics and Analysis for Lanzhou University of Arts and Science

Table 11-14 Structural Statistics of Consultation Objects for Lanzhou University of Arts and Science

Age	Category	Number of persons	Percentage (%)
	Below 18 years old	63	94%
	18-50 years old	4	6%
Gender	Male	1	1%
	Female	66	99%
Ethnic group	Han	64	97%
	Hui	1	1%
	Others	2	2%
Educational background	Secondary specialized school	65	97%
	At and above the level of university	2	3%
Occupation	Student	65	97%
	Teacher	2	3%
Relation with the Project	Less than 1km	66	99%
	1k to 2km	0	0%
	More than 2km	1	1%

Table 11-15 Statistics of Individual Questionnaire Results for Gansu Senior Technical School of Mechanics

Questions	Answers	Number of persons	Percentage
1. What's your level of concern about local environment?	(1) Very high	67	100%
	(2) Relatively high	0	0%
	(3) Average	0	0%
	(4) Zero	0	0%
2. How do you evaluate the environmental condition of the project area?	(1) Very good	26	39%
	(2) Fine	0	0%
	(3) Average	41	61%
	(4) Poor	0	0%
3. What do you think is the most serious environmental problem in the project area?	(1) Air pollution	66	99%
	(2) Water pollution	0	0%
	(3) Noise pollution	0	0%
	(4) Solid waste pollution	1	1%

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

4. Do you know about the components of the Project?	(1) Yes (2) Not very well (3) No	65 0 2	98% 0% 2%
5. Do you think the project will benefit local economic development?	(1) Yes (2) No (3) I have no idea.	66 1 0	99% 1% 0%
6. What do you think is the environmental problem that will produce significant impact on yourself after the Project is implemented?	(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste pollution (5) No impact	0 0 41 0 26	0% 0% 61% 0% 39%
7. What impacts will the project implementation produce on the environmental problems that you are not satisfied with in the project area?	(1) Aggravated (2) Mitigated (3) No impact	0 25 42	0% 37% 63%
8. What's your general attitude toward the Project?	(1) Supportive (2) I don't care. (3) Not supportive	67 0 0	100% 0% 0%
9. Do you think the environmental protection measures proposed under the Project are reasonable?	(1) Reasonable (2) Not sure (3) Unreasonable	67 0 0	100% 0% 0%
10. Can you accept the negative environmental impacts of the Project after the environmental protection measures are taken under the proposed project?	(1) Yes, I can. (2) I am not sure. (3) No, I cannot.	67 0 0	100% 0% 0%

It is known from statistical analysis of the results of individual questionnaires that:

① Environmental condition of the project area

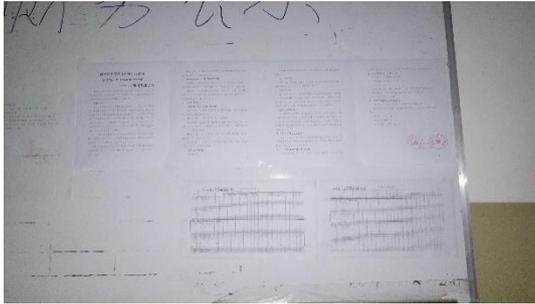
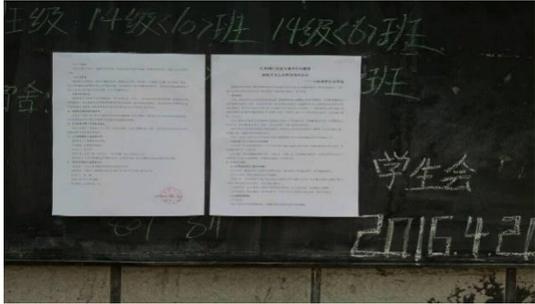
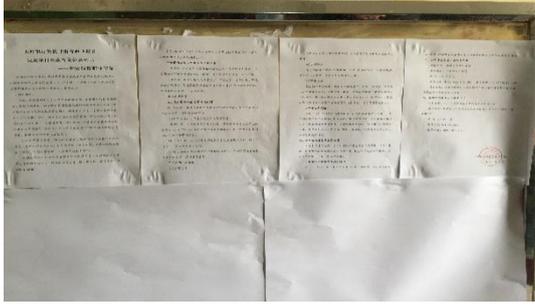
100% of the respondents participating in the questionnaire survey are very highly concerned about the local environmental quality conditions. 39% of the respondents evaluate the local environmental quality as very good while the remaining 61% as average. Air pollution is deemed by 99% of the respondents as the most serious environmental problem in the project area, with the remaining 1% choosing solid waste pollution.

② Expectations on the construction project

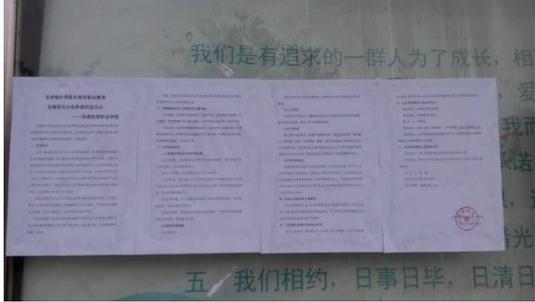
Results of public participation survey indicate that 98% of the public know about the components of the Project while 2% do not. The majority of the respondents think that the Project will benefit local economic development. Regarding the environmental problem that will produce relatively significant impact after the Project is implemented, 61% of the respondents choose air pollution and the remaining 39% choose no impact. 37% of the respondents think that, thanks to the project implementation, the local environmental problems in the project area will be mitigated and 63% think no impact will be produced. The public in the neighborhood show a very high support rate towards the Project, with 100% of the respondents supporting the construction of the Project.

③ Comments and suggestions on environmental protection measures

Table 11-16 List of 1st Information Disclosure

Project School	Location	Photo
Gansu Finance and Trade Vocational College (GFTVC)	Residential area adjacent to GFTVC new campus	
	Bulletin board of Gansu Art Design School	
	Bulletin Board of Gansu Economic and Trade School	
	Bulletin Board of Gansu Industrial and Commercial School	
	Gansu Economic School	

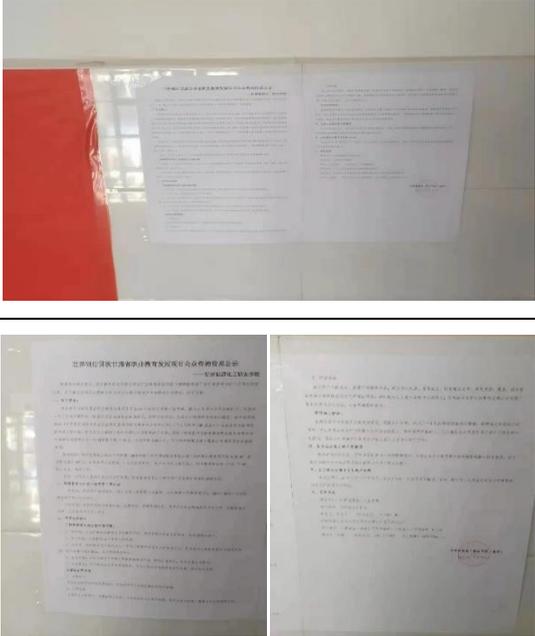
WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project School	Location	Photo
	Gansu Commercial School	
	Bank School	
	Gate of Gansu Finance and Trade Professional College	
	Dormitory Building	 

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

Project School	Location	Photo
Gansu Vocational College of Energy and Chemical (GVCEC)	Construction site of New Campus	
	Bulletin Board of Gansu Senior Technical School of Chemical Industry	
	Main gate of Gansu Construction Material Industry School	
	Residential building in the neighborhood	
	Gansu Coal Industry School	

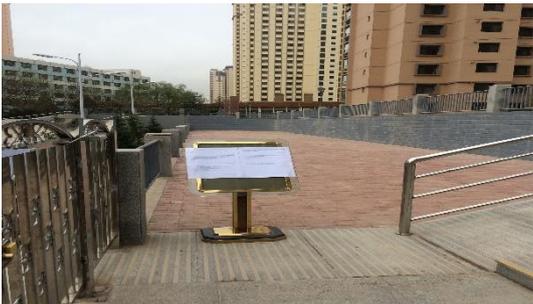
WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project School	Location	Photo
	Residential area in the neighborhood	
	Lanzhou Electronics Industry School	
	Gate of Gansu Vocational College of Energy and Chemical Industry	
	Dormitory Building	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

Project School	Location	Photo
Gansu Senior Technical School of Mechanics	North Campus	
	South Campus	
	Residential building in the neighborhood	
Lanzhou University of Arts and Science	School Gate	
	Hallway of Gansu Art School	

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Project School	Location	Photo
	Residential area in the neighborhood	

11.5.2 2nd Information Disclosure (Full Document Disclosure)

The full document of the Environmental Management Plan was disclosed on websites, public announcements and printed documents available at the Project Management Office after the first draft of the EMP was completed and reviewed by and then revised based on the comments made by the World Bank Safeguard Mission.

The main contents disclosed are:

- 1、 Project Introduction and key EIA conclusions;
- 2、 Notice of Invitation to Public Participation;
- 3、 Download link of the full document of the Environmental and Social Management Plan of World Bank Loan Gansu Technical and Vocational Education and Training Project (Chinese version);

- 4、 Contact information, including the contact person, telephone number, email of the implementation agency and the EIA agency.

Websites of information disclosure are shown in Table 11-17 and 11-18 as follows:

Table 11-17 2nd Information Disclosure on Websites

SN	Name of website	Website	Disclosure Time	Webpage Printscreen of Disclosed Information
1	Gansu Department of Education	http://www.gsedu.gov.cn/Article/Article_36341.aspx	Aug. 24, 2016	
2	Gansu Vocational College of Energy and Chemical	http://www.gsnyc.edu.cn/html/news/gonggao/565.html	Aug. 18, 2016	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

		<p>https://www.gsnh.edu.cn/Info/1/17463/index.aspx</p>	<p>Dec. 18, 2020</p>	
<p align="center">3</p>	<p align="center">Gansu Finance and Trade Vocational College</p>	<p>http://www.gscmxy.com/index.php?_m=mod_article&_a=article_content&article_id=458</p>	<p>Aug. 16, 2016</p>	
		<p>https://www.gscmxy.edu.cn/shjggg/1351.jhtml</p>	<p>Dec. 24, 2020</p>	
<p align="center">4</p>	<p align="center">Lanzhou University of Arts and Science</p>	<p>http://news.luas.edu.cn/news/7986.html</p>	<p>Aug. 15, 2016</p>	

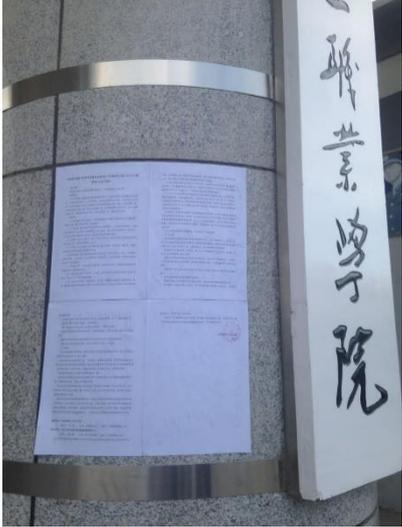
**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

5	Gansu Institute of Mechanical & Electrical Engineering	http://www.gs-jdxy.com/Article/tzgg/2016/08/5221.html	2016.8.18	 <p>The screenshot shows the website of the Gansu Institute of Mechanical & Electrical Engineering. The main content is a public participation notice titled "世界银行贷款甘肃省职业教育发展项目《环境管理计划》全文公示暨邀请公众参与通知". The notice is dated 2016/8/18 and is from the author 梁永信. It mentions that the project includes five schools and aims to improve the teaching system and increase the school's ability to provide services. The notice invites the public to participate in the project.</p>
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<p align="center">世界银行贷款甘肃省职业教育发展项目《环境管理计划》全文公示暨 邀请公众参与通知</p> <p>一、项目名称： 世界银行贷款甘肃省职业教育发展项目——甘肃省能源化工职业学院</p> <p>二、项目简介： 本次“世界银行贷款甘肃省职业教育发展项目”实施内容包含甘肃省能源化工职业学院、甘肃省职业技术学院、兰州文理学院、甘肃省机械高级技工学校、金昌市职业技术学院。其中甘肃省能源化工职业学院总占地面积56080.33㎡，包括：2#教学楼1栋，机房楼2栋14233.06㎡；4#专业实训楼1栋，机房楼2栋14762.83㎡；31#、32#学生宿舍舍2栋，总占地面积20126.42㎡；30#学生宿舍一座，建筑面积6955㎡。</p> <p>三、评价结论： (1)通过对建筑工程环境影响评价，学校在教学建设对环境的影响将来自于施工方面，其建设施工对环境的影响，具体如下： 1) 大气环境：施工过程中运输车辆行驶、建筑材料、土方堆放产生的扬尘，混凝土和砂浆拌合作业过程产生的扬尘，土方、渣土、施工机械扬尘比产生的扬尘，以及施工机械车辆的尾气排放。运营期主要为食堂餐饮油烟。 2) 水环境：施工废水产生、施工人员的生活污水、生活污水及厕所污水及油漆污水及废水污染。运营期主要为生活污水。 3) 声环境：施工机械和运输车辆在施工期产生噪声，如发电机、打桩机、挖土机等机械运行等影响项目周围声环境。 4) 固体废物：施工期的固体废物有建筑垃圾（包括未硬化的土、渣、工地垃圾、包装材料等）、生活垃圾、废水沉淀物（如沉淀池）产生的底物等。运营期主要为生活垃圾、餐厨垃圾等。 a) 安全风险分析：施工及施工机械布置、运输车辆行驶、建筑材料堆放会对校园内师生安全带来隐患。 (2) 针对上述工程对大气环境、水环境、声环境及固体废物处理方面产生的不利影响，分别提出以下防治和减缓措施： 1) 施工过程中洒水降尘、洒水降尘；土方、渣土、建筑垃圾运输车辆，应由洒水、雾炮、吸尘作业装置或喷淋装置、轮胎冲洗和冲刷装置及冲洗装置；加强运输车辆管理，</p>	<p>在车辆驶入施工现场附近时应缓慢慢行，减少车辆行驶时的扬尘，同时限速70km/h。扬尘和施工扬尘的扬尘车辆扬尘问题可采取措施。 2) 施工场地应修建沉淀池并设置洒水系统，经沉淀后的废水可用于施工场地洒水降尘；施工结束后应及时清洗机械、车辆维修点或清洗站，应专业的维修点转移，避免施工场地产生含油污水；机械设备的维护应转移到维修站或维修点。 3) 对于产生较大噪声的机械设置相应的减噪或降噪措施，如：使用防振垫、设置减振器、严格控制施工时间、合理安排工期、避免同一施工区、同一时间多件大型高噪声机械同时作业；设置隔音屏障或隔音墙等设施，将噪声可能超标在禁止工作状态和噪声超标水平；场内设置噪声监测点或噪声监测站；施工运输车辆在施工场地附近减速慢行。 4) 在施工、拆除和材料运输产生的噪声除进行分区设置、将噪声直接控制到最小可再生的材料进行分离回收、再利用，其余部分委托给施工单位清理，监理单位应委托有资质的环境监测单位资质证书；施工中，如噪声超标，必须立即停止施工或采取相应的措施；定期对噪声向中的回音墙进行检测；工程结束后，施工过程中产生的固体废物必须及时清运。 (3) 针对学校安全稳定影响，同时制定以下减缓措施。 1) 施工期 ①在校内北侧设置一次施工围挡约30#、31#、32#楼的施工，并将施工围挡与施工区施工围挡进行封闭围挡，与周围的原有围挡隔离。在校内南侧的施工区设置围挡一次施工围挡约31#、32#楼的施工，施工期要求全封闭管理。 ②在施工现场设置专人值守，施工工人不得随意进出学校宿舍楼、实训楼、食堂、图书馆等教学区。 ③靠近教学区附近的施工场地应设置围挡，由教学区中设置警示牌，应安排有专人负责区域的学生人员的管理，要求学生在施工期施工时，不得在施工现场附近停留。 ④避免在中午12:00-14:00及夜间22:00-07:00施工；避免在上课时间进行高噪声施工。 ⑤避免在课堂的液体式机械式打桩机。 ⑥在施工现场设置噪声监测点，要求在教学区设置噪声监测点。 ⑦车辆统一由校门口大门出入，并严格按照规定路线行驶，未经允许，不得在教</p>
<p>区内随意通行。 ⑧运输车辆驶入校区后应限速行驶，并注意观察路上行人，保障交通安全。 ⑨运输车辆在校区内行驶时，不得鸣笛。 ⑩运输建筑材料及渣土时，应遮盖严密，严禁扬尘，车速不得超过规定。 ⑪施工围挡设置应符合规范和标准，设置围挡高度，建设至学校围墙或围墙外一米处。 ⑫施工在夜间施工时应设置至兰州新区夜间施工围挡规定地点； ⑬施工围挡应设置警示标志，要设置围挡区环卫部门及城管。 2) 运营期 ①食堂厨房设置油烟净化器，将油烟净化后排放至室外高空排放，进入高空排放，按照生活垃圾分类处理的要求进行统一处理。 ②食堂操作间内设置集气罩、专用烟道、油烟净化器，集气罩应建厨房排气罩排气罩收集后经分风器接入油烟净化器净化后经排气罩排放到《饮食业油烟排放标准》(GB18483-2001)标准后排放，并设置油烟净化器出口与室外高空排放，设置高空排放。 ③食堂厨房排气罩应设置与室外高空排放。 ④食堂厨房设置油烟净化器，确保食堂产生的油烟经油烟净化器净化后高空排放，进入高空排放处理，严禁将油烟直接排放。 ⑤食堂厨房设置油烟净化器，油烟经不停净化后可进行排放，防止排放油烟中有害物质和异味，排放应符合有关部门的要求排放，并按照兰州新区环保局的要求进行处理。 通过对本项目实施环境管理计划，结合兰州新区的建设符合国家和地方的相关政策规定，有利于兰州新区经济社会的发展。上述工程建设和运营期的环境影响通过采取合理措施，影响可接受。在建设单位严格执行环境“三同时”制度，落实各项环境管理计划的前提下，本建设项目从环境保护的角度来说是可行的。</p> <p>委托单位：甘肃省能源化工职业学院 联系人：李 强 电话：13893021963 Email: 707138057@qq.com</p> <p>评价单位：兰州大学应用技术研究院有限责任公司 联系人：陈 敏 电话：0931-8912021 Email: cm0931@qq.com</p> <p>您好！本项目的建设和环境影响评价的结论和意见是依据建设项目的环评报告编制与</p>	<p>公众联系，为重要的参与和贡献！ 本项目《环境管理计划》(附件)已报送兰州新区管委会，并提供全文下载(http://www.gnvedu.cn/html/news/gonggao/565.html)，供大家查阅反馈。 甘肃省能源化工职业学院 2016.9</p>

Figure 11-2 Schematic Diagram of 2nd Public Announcement

Table 11-18 Public Announcement Posted in the 2nd Information Disclosure

Project School	Location	Photo
Gansu Vocational College of Energy and Chemical	School Gate	
		
	Affected school buildings	

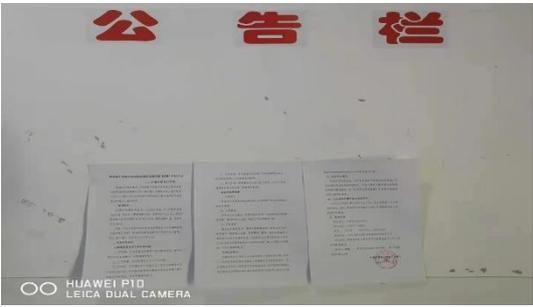
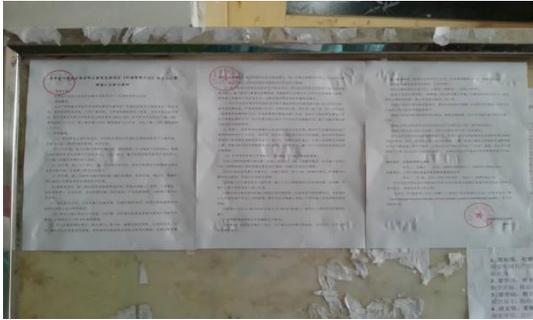
**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

Project School	Location	Photo
		 <p>A photograph showing the entrance of a building. Above the glass doors, there are two red signs with white Chinese characters: '出口' (Exit) on the left and '入口' (Entrance) on the right. Above the entrance, a yellow sign reads '6号公寓楼' (Building 6).</p>
		 <p>A photograph showing the entrance of a building, similar to the one above. Above the glass doors, there are two red signs with white Chinese characters: '出口' (Exit) on the left and '入口' (Entrance) on the right. Above the entrance, a yellow sign reads '7号公寓楼' (Building 7).</p>
	<p>Residential area in the neighborhood</p>	 <p>A photograph of a wall with large, golden Chinese characters '煤校小区' (Mei School Residential Area). A white notice is pinned to the wall below the characters.</p>

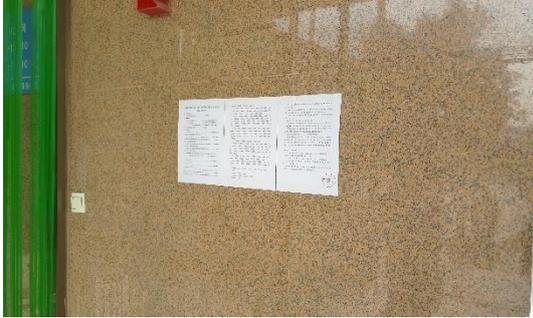
**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

Project School	Location	Photo
	Hospital in the neighborhood	
	Residential area in the neighborhood	
Gansu Finance and Trade Vocational College	School Gate	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

Project School	Location	Photo
	School Bulletin Board	
	School bulletin board	
	Residential area in the neighborhood	
Lanzhou University of Arts and Science	School Gate	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

Project School	Location	Photo
	Gate of school library	
	Main gate of teaching building	
	Main gate to staff residential area	
	Gate of residential area in the neighborhood	

**WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan**

Project School	Location	Photo
Gansu Institute of Mechanical & Electrical Engineering	School Gate	
	School bulletin board	

11.5.3 Summary of Public Participation Opinions and Feedbacks

In the EIA process of the Project, 2 rounds of information disclosure and public participation activities were carried out. In the early stage of public participation survey, opinions and requests of the school stakeholders were collected and environmental mitigation measures (as described in detail in Section 7) were developed for the project schools based on their specific circumstances. Public opinions were incorporated into the ESMP and detailed requirements on management of construction noise, construction dust and construction sites and operation of construction vehicles. The first draft of ESMP was finalized and disclosed in full document and public feedbacks and opinions were further collected and incorporated for the final revision and improvement of ESMP.

Table 11-19 describes in detail the public feedbacks as well as ESMP responses involved in this public participation process.

Table 11-19 Summary of Public Participation Opinions and Feedbacks

Name of schools	Public opinions and suggestions	EMSP responses to public opinions
GVCEC	<ol style="list-style-type: none"> 1) If not properly managed, the construction vehicles will cause impacts on safety of teachers and students in campus. Therefore, the construction vehicles should be required to use the east gate and the entire construction site should be fully closed and separated from the teaching and living areas to assure normal order of teaching and daily life activities. 2) Construction activities adjacent to student dormitories will affect resting of students. Therefore, construction at noon and at night should be suspended and sound insulation walls should be constructed to the west of the Practical Training Building to separate it from the existing buildings and minimize impacts of construction noises. 3) Through adequate discussion and communication, the meeting participants believe that the WB loan construction project is a significant affair for promoting the development of the project school and they understand and support the project. 4) Air pollution, dust, construction waste and domestic waste may be generated during the construction, which requires regular water sprinkling to reduce air pollution. Construction waste and domestic waste should be sorted and cleaned up in time. 5) Do not destroy the plants around the construction site during the construction. 6) Due to the large flow of people in the school, pay attention to the safety of construction workers, teachers and students in the school 	<ol style="list-style-type: none"> 1) One centralized construction camp should be set up at the northeastern corner of the campus used for construction of Buildings No. 30, 31, 32 and 33. The construction camp and the three construction sites should be separated from the surrounding dormitory buildings with closeable fences. Another centralized construction camp should be set up in an unoccupied area in the middle east of the campus for construction of Building No. 4 and No. 24. A fully closed management system will be adopted for the construction sites. 2) Special personnel should be assigned to carry out tour inspections around the construction area. Construction workers should not be allowed to enter the student dormitory buildings and practical training buildings without due authorization while non-constructional personnel should not be allowed to enter the construction area without due authorization. 3) Stronger efforts should be made in inspection in the construction sites around student dormitories, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites. 4) Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours. 5) Low-noise pneumatic or spiral pile drivers should be used. 6) The construction site of Practical Training Building No. 4 is located very close to Practical Training Building No. 3 and the noise standard is exceeded by 10.46dB(A). In order to assure effective noise reduction, sound insulation retaining walls (with a noise reduction of 6-10dB(A)) should be provided around the construction site and sound insulation windows should be installed to avoid impacts from construction noise and assure that the sound environment in the Practical Training Building complies with the standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the western and northern sides of the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction. 7) Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization. 8) Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety. 9) No honking is allowed when construction vehicles travel on campus. 10) Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road. 11) Temporary toilets and septic tanks should be provided in construction camps and night soil should

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

	<p>during the construction.</p>	<p>be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment.</p> <p>12) The construction contractors should remove and transport the construction solid wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District.</p> <p>13) Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou New District.</p> <p>14) It is required to strictly implement mitigation measures for sensitive protection targets and traffic safety protection regulations.</p> <p>15) It is required to strictly implement World Bank's policies on COVID-19 prevention and control.</p>
<p style="text-align: center;">GFTVC</p>	<p>1) The construction activities in the construction period should be scheduled in such a way that construction in the resting periods of students and teachers and at night is avoided.</p> <p>2) The construction area and the teacher and student activity areas should be clearly identified and separated if possible.</p> <p>3) Construction workers should wear working clothes and badges and site access should be strictly controlled;</p> <p>4) Vehicles entering and leaving the site should obey directions and serious attention should be paid to traffic safety;</p> <p>5) Actions should be properly implemented to address dust pollution.</p>	<p>1) A centralized construction camp should be set up in the southeastern corner of the campus for construction of school buildings. Closeable fences are required to separate it from the construction area.</p> <p>2) The construction site in Area C of Dormitory Building No. 22 should be fenced up. A temporary gate should be opened on the east side of the site near the road for construction workers and vehicles to pass through under closed-off management. Anti-falling frames should be set up above the road on the west side of the site to prevent falling objects from harming people.</p> <p>3) Special personnel should be assigned to carry out tour inspections around the construction area. Construction workers should not be allowed to enter the student dormitory buildings and practical training buildings without due authorization while non-constructional personnel should not be allowed to enter the construction area without due authorization.</p> <p>4) Stronger efforts should be made in inspection in the construction sites around student dormitories, in particular in the breakfast, lunch and supper hours, and special personnel should be assigned to manage students in this area. Students should be instructed to stay away from and not to stick around the construction sites.</p> <p>5) Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours.</p> <p>6) Low-noise pneumatic or spiral pile drivers should be used.</p> <p>7) Vehicles should enter and leave the campus via the East Gate and travel along designated routes and should not travel in campus without due authorization.</p> <p>8) Transportation vehicles on campus should follow the guide by special personnel and pedestrians on the road should be diverted to assure traffic safety.</p> <p>9) No honking is allowed when construction vehicles travel on campus.</p> <p>10) Transportation of construction materials and construction debris should occur during class hours with minimal pedestrians on road.</p> <p>11) Due to campus environment restrictions, it is necessary to provide a special road on the construction site of Building No. 18 as a construction transportation access road connecting the East Gate. Therefore, a reasonable route planning is needed and it is recommended that fences are installed to separate pedestrian from traffic.</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT

Environmental and Social Management Plan

		<p>12) Based on the layout of the school buildings, it is recommended to close roads adjacent to the construction area on the east side of the campus and arrange all students and faculty to use roads on the west side of the campus.</p> <p>13) Temporary toilets and septic tanks should be provided in construction camps and night soil should be collected and delivered on a periodical basis to Lanzhou New District Municipal Wastewater Treatment Plant for treatment.</p> <p>14) The construction contractors should remove and transport the construction solid wastes in time to places of storage designated by the environmental sanitation authority of Lanzhou New District.</p> <p>15) Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou New District.</p> <p>16) It is required to strictly implement mitigation measures for sensitive protection targets and traffic safety protection regulations.</p> <p>17) It is required to strictly implement World Bank's policies on COVID-19 prevention and control.</p>
<p align="center">LUAS</p>	<p>1) It is recommended that the traffic police authority will install video cameras at road intersections.</p> <p>2) Dust should be minimized or dust prevention measures should be taken.</p> <p>3) Night construction should be reduced to avoid impacts on student resting.</p> <p>4) Actions are needed to safeguard student safety in the construction period.</p> <p>5) The construction areas in campus should be closed to prevent students from entering the construction sites.</p> <p>6) The construction contractors should have their staff on site registered and filed at the School Security Department.</p>	<p>1) It is recommended that a temporary exit be opened on the side of the construction site on Yanbei Road and the construction site is connected with the school fencing wall to form an independent and closed construction area. All construction plants, vehicles and personnel will enter and leave the construction site via the temporary exit to realize full separation of construction activities from teaching activities, effectively avoid mutual impacts between construction workers, construction vehicles and pedestrians and vehicles in campus and minimize impacts on normal teaching activities on campus and the dense pedestrian flows appearing in the morning, noon and evening peak hours at the existing gate.</p> <p>2) A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the northeastern side of the construction site far away from the teaching building and practical training rooms.</p> <p>3) Protective fences should be provided along roads south of the construction site at the entrance and exit of the Practical Training Building to prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order.</p> <p>4) The tower cranes should be located with the surrounding buildings and pedestrian safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians.</p> <p>5) High-noise construction activities should be avoided in class hours.</p> <p>6) Noises generated by the construction activities exceed the standard by 20dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows (with a noise reduction of 10-15dB(A)) are installed to effectively avoid impacts of construction noises and assure compliance with the sound</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT

Environmental and Social Management Plan

		<p>environment standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the building to be constructed and be able to move with the floors under construction.</p> <p>7) Foundation excavation should be carried out manually.</p> <p>8) Special personnel should be assigned to guide construction vehicles entering the construction site and strictly travel along designated routes on site. No honking is allowed when construction vehicles travel on campus.</p> <p>9) A reasonable time schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided. Large transportation vehicles should not be allowed to enter the campus before 20:00.</p> <p>10) Active efforts should be made to coordinate and negotiate with the traffic police about the need of traffic safety management at the front gate and early installation of video camera surveillance equipment.</p> <p>11) The construction contractors should have all their staff on site registered and filed at the School Security Department and rent residential houses in the neighborhood as the accommodation of construction workers.</p> <p>12) Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage should be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Lanzhou Municipal WWTP for compliance treatment.</p> <p>13) Construction solid wastes should be declared and reported to Lanzhou Urban Management and Administrative Law Enforcement Bureau and a Letter of City Image and Environmental Sanitation Responsibility should be signed. Lanzhou Urban Management and Administrative Law Enforcement Bureau will be responsible for supervising and managing the disposal of all construction solid wastes of the proposed project.</p> <p>14) Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Lanzhou City.</p>
GVTCM	<p>1) Noise and dust impacts on teaching activities should be reduced in the construction period.</p> <p>2) Stronger efforts should be made in management of construction vehicles to prevent traffic accidents.</p> <p>3) Management over construction workers should be strengthened.</p> <p>4) Protective fences should be provided along roads around the construction sites to</p>	<p>1) A reasonable layout plan should be developed for the construction site. Based on the location of the Teaching Building, high-noise equipment including the mixers and cutters, as well as material stockpiling sites easily generating dusts should be located on the southwestern side of the construction site far away from the teaching building, dormitory building and practical training rooms.</p> <p>2) Protective fences should be provided along roads around the construction sites to prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order.</p> <p>3) The tower cranes should be located with the surrounding buildings and pedestrian</p>

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

	<p>prevent high-altitude falling objects and warning signs should be provided. Pedestrians should be prohibited to stick around the respective area and special personnel should be assigned during pedestrian peak hours to maintain order</p>	<p>safety taken into account to prevent safety hazards possibly to arise when materials are hoisted at high altitude over pedestrians.</p> <ol style="list-style-type: none"> 4) Construction should be avoided in the noon hours of 12:00 – 14:00 and night hours of 22:00 – 07:00 the next day; High-noise construction activities should be avoided in class hours. 5) Noises generated by the construction activities exceed the standard by 16.48dB(A) to the maximum. Sound insulation retaining walls (with a noise reduction of 6-10dB(A)) are recommended around the construction sites and sound insulation windows are installed to effectively avoid impacts of construction noises and assure compliance with the sound environment standard. The sound insulation retaining wall should not be lower than 5m in height and should fully surround the building to be constructed. The sound insulation retaining wall should be able to move with the floors under construction. 6) Low-noise pneumatic or spiral pile drivers should be used. 7) In order to avoid health impacts by construction dust on those exercising on the sport ground, it is recommended that the school should adjust the teaching schedule to avoid teaching activities on the sport ground in the ground excavation stage with high incidence of dusting; double-layer dust screens should be used and water should be sprayed in the other construction periods to minimize dust generation. 8) Special personnel should be assigned to guide construction vehicles entering the construction site via the East Gate and make sure the vehicles strictly follow the designated routes on site. Pedestrians on the road should be diverted to assure traffic safety. 9) No honking is allowed when construction vehicles travel on campus. 10) A reasonable time schedule should be developed for vehicles entering and leaving the campus so that transportation is arranged in class hours with little pedestrian flow and the morning, noon and evening peak hours are avoided. Large transportation vehicles should not be allowed to enter the campus before 20:00. 11) Temporary toilets and septic tanks should be provided in the construction camp and connected to the in-campus sewage pipelines. The construction and domestic sewage will be pre-treated in the septic tanks and then delivered to the school sewage and drainage pipelines and finally to Tianshui Municipal WWTP for compliance treatment. 12) Construction solid wastes must be collected at designated locations and subject to centralized disposal by Tianshui Environmental sanitation Bureau at designated solid wastes landfill sites. 13) Domestic solid wastes in the construction period should be collected at designated site and removed by the environmental sanitation authority of Tianshui City.
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11.6 Conclusions and Recommendations of Public Participation

11.6.1 Conclusions of Public Participation

This public participation process enables the EIA agency to collect extensive public information related to the construction of the Project and plays a positive guiding role in coordinating project construction and environmental protection. In addition, the public participation activities also enhanced the public understanding of and supports to the Project and contributed significantly to improvement of project design and promotion of EIA effectiveness, laying a solid foundation for smooth implementation of the Project. It is known from the public participation that the public in the project area and the teachers and students of the project schools are supportive to the Project and believe that the construction of the Project is favorable to the development of local education.

(1) Extensive supports from the concerned government authorities and recognition by the public in the project area create a favorable environment for the implementation of the Project. In addition, public participation, in particular participation by the local government authorities, provides an excellent opportunity of integration for the Project and the regional development and the general public.

(2) The public wishes that the implementation agency will highly recognize the importance of environmental protection, take specific actions to implement environmental protection and management measures and make all efforts to minimize the environmental impacts of the construction period, safeguard the public benefits and maximize the social benefits of the Project.

11.6.2 Relevant Recommendations

Based on the results of the public participation survey, the following recommendations are proposed:

In the construction process of the Project, the construction contractors should strictly follow the environmental protection requirements specified in the EMP and properly address the various environmental impacts and problems arising from construction noise, dust, wastewater and solid wastes in the construction period to enable the Project to benefit not only the development of local education sector but also environmental protection and achieve the coordination of project construction and environmental protection.

12. Summary

12.1 Project Construction Components

The “World Bank Loan Gansu Technical and Vocational Education and Training Project” involves the construction of project components in four project schools, which, in nature, may be further categorized into “hard activities” aiming at infrastructure construction or equipment procurement and “soft activities” aiming at strengthening the development of TVET system and improving the quality and relevance of TVET delivery in Gansu Province. The “hard activities” mainly include construction of school buildings and procurement of associated equipment for the four project schools. The remaining components constitute the “soft activities”. The component involving environmental management plans is the construction of school buildings in the four project schools, including teaching building, practical training building, student dormitory building and canteen of Gansu Vocational College of Energy and Chemical (GVCEC), practical training building, teaching building and student dormitory building of Gansu Finance and Trade Vocational College (GFTVC), the Art Practice Center of Lanzhou University of Arts and Science (LUAS) and the teaching building and teaching and office building of Gansu Senior Technical School of Mechanics (GSTSM).

12.2 Conclusions of Environmental Analysis of the Project

It has been discovered during the identification of the construction components of the Project that the key impacts on environment generated in the school building construction of the four project schools come from the civil works are mainly environmental impacts in the construction period including:

(1) Air environment: dust brought by vehicles travelling on construction sites, dust generated by construction materials and earthwork stockpiling, dust generated in concrete and mortar mixing operations, dust generated in the transportation process of earthwork, debris and construction solid wastes, tail gas emitted by construction plants and vehicles in the construction process. Pollutant in the operation period mainly includes canteen cooking fume.

(2) Water environment: Water pollution caused by construction wastewater, domestic sewage of construction workers, water permeated from ground pit excavation and wastewater containing machine oil and grease. Domestic sewage is the main pollutant in the operation period.

(3) Sound environment: Noise generated by the construction plan and transportation vehicles in the construction period and mechanical operation of power-driven equipment, bulldozers, and excavators will impact the sound environment in the neighborhood of the

project area.

(4) Solid wastes: Solid wastes in the construction period include construction solid wastes (including cement debris, steel, site fencing panels, packaging materials, etc.), domestic solid wastes and wastes generated by wastewater treatment facilities (such as sedimentation tanks). In the operation period, the impact mainly comes from domestic solid wastes.

12.3 Conclusions of Environmental Impact Mitigation Measures

To address the adverse impacts generated by the civil works on the air environment, water environment, sound environment and solid wastes, the following prevention and mitigation measures are proposed:

(1) Necessary site hardening and water spraying should be conducted for dust suppression; fugitive and fine-particle bulk materials should be stored in an airtight way and covering measures should be taken during loading and unloading and handling operations, with remaining particulate materials after stockpile relocation removed in time; stronger efforts should be made in transportation vehicle management. Vehicles should slow down when approaching the construction sites to reduce dust generation and airtight measures should be taken for the loading space of transportation vehicles engaged in earthwork debris and construction solid wastes transportation.

(2) Sedimentation tanks should be constructed on the construction sites for sedimentation of production wastewater and the wastewater after sedimentation may be reused on the construction site or for dust suppression; construction plant and vehicles should not be repaired or washed on construction sites and should be sent to professional repair shops for maintenance to avoid the generation of oil-contaminated wastewater in the construction site; oil or water leaks should be inspected and repaired before the mechanical equipment is put into service.

(3) Mechanical equipment generating strong noises should have shock-absorbing foundations or vibration-reducing pedestals and should be wrapped with damping materials; low-noise equipment needs to be used and construction time strictly controlled. The time table should be reasonably arranged to avoid simultaneous operation of multiple large and high-noise mechanical plants on the same construction site and in the same period; the contractors need to have the construction equipment maintained on a periodical basis and kept in the best working condition and at the lowest noise level; the idle facilities on site must be in an inactive or throttle shock-absorbing state; construction and transportation vehicles must slow down and not honk around the construction sites.

(4) Solid wastes generated from construction, demolition and site clearing processes should be subject to classified treatment. Reusable or recyclable materials should be collected, classified and recycled while the remnants removed out of site by a consigned agency; soil contaminated by any oil or grease spillage in the construction process must be immediately removed; obstructions in the drainage ditches should be removed on a periodical basis and all solid wastes generated in the construction activities must be fully removed after the construction activities are completed.

12.4 Conclusions on Environmental Monitoring Plan

It is necessary to conduct environmental monitoring in order to properly implement environmental protection in the project implementation area, verify the environmental impact prediction and assessment results, and prevent environmental damages caused by unexpected accidents and develop a detailed implementation plan for the environmental protection measures. Environmental monitoring also provides a scientific basis for the activities of environmental pollution control and environmental management in the operation period of the Project as well as the environmental protection work of the region as a whole.

12.5 Conclusions on Public Participation

The stakeholders in the area around the four project schools in general know about, support and have no objections to the implementation of the Project; they believe that the construction of the Project will benefit local economic development and improve quality of local environment and expect that the Project will be implemented as soon as possible according to the respective quality and quantity requirements and the environmental protection activities under the Project will be properly implemented to realize the social, environmental and economic benefits of the Project at the earliest possible date.

12.6 Conclusions on Comprehensive Assessment

According to the implementation results of the EMP under the Project, it is believed that the construction of the Project complies with the relevant national and local policies and plans and will drive local economic and social development. With reasonable measures implemented, the environmental impacts of the civil works in the construction period and in the operation period are acceptable. If the “three-simultaneousness” system is strictly enforced and the various environmental protection measures proposed in this EMP are fully implemented by the implementation agency, the Project is feasible from the perspective of environmental protection.

Attached Table 1

Civil Works Construction Checklist

Serial Number: _____ Contract Number & Description: _____

Name of Project: _____ cc: _____

Construction Stage: _____ Checked by: _____ Date: _____

Check Item	Implemented?			Remarks/ Recommended Action
	Yes	No	N/A	
1. Pre-commencement check				
Has a construction team been employed?				
Is the construction site fully prepared and construction plant in normal condition?				
Are temporary pass permits provided for and carried by the construction workers entering and leaving the construction sites?				
Is the project information disclosed on bulletin boards at and around the construction sites?				
Are masks, earplugs, arc protective glasses and other construction protective devices prepared?				
Are the materials in use environment-friendly and nontoxic?				
Others, please specify:				
2. Air pollution control				
Is water sprayed on construction sites in dry weathers for dust reduction?				
Are vehicles transporting powdery substances covered and washed before leaving site?				
Are dusty sites sprayed with water for dust suppression?				
Are actions taken to assure that water consumption for dust suppression does not affect surface water runoffs or water usage in local communities?				
Are stockpiling sites of powdery materials covered or sprayed with water for dust reduction? Are cement bags opened at places with proper coverage?				
Are cargoes properly covered and firmly fastened in transportation?				
Are impacts of wind direction taken into account upon selection of material stockpiling sites?				
Are windproof and dust suppression actions considered and taken for stockpiling of construction materials?				
Do the construction vehicles abide by the speed limit requirements?				
Are construction vehicles washed before they are allowed to travel on road?				
Are residual powdery and dusty materials removed and cleaned from site after the material stockpile is removed?				
Others, please specify:				
3. Water pollution control				
Are drains and gutters dredged regularly?				
Are domestic sewage of construction workers and wastewater from equipment washing treated by the existing school				

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Check Item	Implemented?			Remarks/ Recommended Action
	Yes	No	N/A	
wastewater treatment equipment (and discharged into existing municipal sewers or treated in existing school septic tanks if no municipal sewers are available)?				
Are the wastewater treatment systems on construction sites (e.g. sedimentation tanks) in normal operation and maintenance?				
Are plants and equipment washed and cleaned before demobilized from construction sites?				
Others, please specify:				
4. Noise pollution control				
Are the relevant noise laws and regulations respected during construction?				
Are effective construction noise permits used for periods of noise prohibition or noise limit?				
Are noise-generating equipment operations enclosed indoors with door closed?				
Are low-noise equipment used during construction?				
Are construction activities implemented within specified working hours to reduce noise pollution?				
Do contractors provide proper maintenance of construction plants to keep them in optimum work condition and lowest noise level?				
Are idle facilities on site in shut-down or throttle damping state?				
Is night construction, if needed, approved by the concerned authority and carried out in approved hours?				
Others, please specify:				
5. Solid waste management				
Are construction sites kept in a clean and well-organized condition?				
Are construction wastes, recyclable wastes and ordinary solid wastes stored on site removed and classified on a periodical basis?				
Are there any oil spills during construction and is the contaminated soil immediately decontaminated?				
Are all residual solid wastes immediately removed out of the construction sites and properly treated upon project completion?				
Are domestic solid wastes transported in covered container or trucks to designated solid waste treatment and disposal sites?				
Is there adequate space on the construction sites for temporary storage of various solid wastes?				
Others, please specify:				
6. Personal health and safety management				
Are fire-fighting equipment provided for camps, on-site facilities and construction sites?				

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Check Item	Implemented?			Remarks/ Recommended Action
	Yes	No	N/A	
Do the machinery operators and vehicle managers have required operation permits?				
Are the construction camps and sites adequately equipped with fire-fighting devices, hoses and hydrants?				
Do the construction workers wear masks, earplugs, arc protective glasses and other protective devices when necessary?				
Others, please specify:				
7. Gansu Vocational College of Energy and Chemical				
Are the construction camps located at the positions designated in the EIA process?				
Are closed fences provided around the construction sites to isolate the construction areas?				
Are special personnel designated for routine inspection of construction safety and management of construction staff on the periphery of construction sites?				
Are vehicles on site travelling according to the requirements and enter and leave the campus via the East Gate?				
Are low-noise pneumatic or spiral pile drivers adopted?				
Are actions taken on No. 30, No. 31, No. 32 and No. 33 construction sites to avoid construction in the hours of 12:00 to 14:00 at noon and 22:00 to 07:00 at night?				
Are actions taken on No. 4 construction site to avoid high-noise construction activities during class hours?				
Are sound insulation fencing walls provided around No. 4 construction site?				
Are temporary toilets and septic tanks provided as required and managed according to the EIA requirements?				
Does the rotation radius of the tower cranes meet the height limits of adjacent buildings and safety requirements for persons beneath?				
Others, please specify:				
8. Gansu Finance and Trade Vocational College				
Are the construction camps located at the positions designated in the EIA process?				
Are closed fences provided around the construction sites to isolate the construction areas?				
Are special personnel designated for routine inspection of construction safety and management of construction staff on the periphery of construction sites?				
Are vehicles on site travelling according to the requirements and enter and leave the campus via the East Gate?				
Are low-noise pneumatic or spiral pile drivers adopted?				
Are actions taken on No. 22 construction site to avoid construction in the hours of 12:00 to 14:00 at noon and 22:00				

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Check Item	Implemented?			Remarks/ Recommended Action
	Yes	No	N/A	
to 07:00 at night?				
Are actions taken on No. 21, 18, 19 and 20 construction sites to avoid high-noise construction activities during class hours?				
Are temporary toilets and septic tanks provided as required and managed according to the EIA requirements?				
Does the rotation radius of the tower cranes meet the height limits of adjacent buildings and safety requirements for persons beneath?				
Others, please specify:				
9. Gansu Senior Technical School of Mechanics				
Are the construction sites arranged according to the EIA requirements?				
Are special personnel designated for routine inspection of construction safety and management of construction staff on the periphery of construction sites?				
Are protective fences and warning signs provided against high-altitude falling objects along access roads?				
Are actions taken to avoid construction in the hours of 12:00 to 14:00 at noon and 22:00 to 07:00 at night and avoid high-noise construction during class hours?				
Are colored steel sheet sound insulation fences moveable with construction floors provided on the periphery of buildings?				
Are low-noise pneumatic or spiral pile drivers adopted?				
Are special personnel designated to guide and assure the construction vehicles to travel according to the respective requirements?				
Are temporary toilets and septic tanks provided as required and managed according to the EIA requirements?				
Does the rotation radius of the tower cranes meet the height limits of adjacent buildings and safety requirements for persons beneath?				
Others, please specify:				
10. Lanzhou University of Arts and Science				
Are the construction sites arranged according to the EIA requirements?				
Are special personnel designated for routine inspection of construction safety and management of construction staff on the periphery of construction sites?				
Are protective fences and warning signs provided against high-altitude falling objects along access roads?				
Are actions taken to avoid high-noise construction activities during class hours?				
Are colored steel sheet sound insulation fences erected around buildings?				

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

Check Item	Implemented?			Remarks/ Recommended Action
	Yes	No	N/A	
Is manual excavation method adopted during construction?				
Are special personnel designated to guide and assure the construction vehicles to travel according to the respective requirements?				
Are temporary toilets and septic tanks provided as required and managed according to the EIA requirements?				
Does the rotation radius of the tower cranes meet the height limits of adjacent buildings and safety requirements for persons beneath?				
Others, please specify:				

Attached Table 3

World Bank Loan Gansu Technical and Vocational Education and Training Project Public Consultation Questionnaire

I. Project Basic Information

Project Name	World Bank Loan Gansu TVET Project		
Nature of Construction	New	Purpose of Construction	School Education
Construction Scope	<p>The “World Bank Loan Gansu TVET Project” involves the construction of project components in four project schools, which, in nature, may be further categorized into “hard activities” aiming at infrastructure construction or equipment procurement and “soft activities” aiming at strengthening the development of TVET system and improving the quality and relevance of TVET delivery in Gansu Province. The “hard activities” mainly include construction of school buildings and procurement of associated equipment for the four project schools. The remaining components constitute the “soft activities”. The component involving EMPs is the construction of school buildings in the four project schools, including teaching building, practical training building, student dormitory building and canteen of Gansu Vocational College of Energy and Chemical involving a total building area of 74295.07m², practical training building and student dormitory building of Gansu Finance and Trade Vocational College involving a total building area of 77759.11m², the Art Practice Center of Lanzhou University of Arts and Science involving a total building area of 6100m², and the teaching building and teaching and office room building of Gansu Senior Technical School of Mechanics involving a total building area of 34782m².</p>		
Key environmental problems arising from project construction	<p>Upon the completion of the Project, impacts will be generated on the environment mainly in the following aspects:</p> <ol style="list-style-type: none"> 1. Sound environment Upon completion, the Project will mainly be used for teaching and student activities and the noises as generated are noises from social activities with little impacts on residents in the neighborhood. 2. Air environment Upon completion, the Project will involve canteen fume from some individual schools and little impacts will be produced on the air environment. 3. Water environment Wastewater generated by the Project upon completion will mainly comprise of domestic wastewater generated from teaching activities and student dormitories, which will be collected and delivered via the municipal wastewater pipeline to local WWTP for treatment, with little impacts on water environment. 4. Ecological environment 		

WORLD BANK LOAN GANSU TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING PROJECT
Environmental and Social Management Plan

	<p>The land used for construction of the Project is in-school constructional land and complies with the land use planning, involving substantially no impacts on the ecological environment.</p> <p>4. Social impacts</p> <p>Construction of the Project will cause certain impacts on teaching activities and the daily life of students and teachers. Upon completion, with teaching as its main function, the Project will facilitate development of local education and promote national quality.</p>
<p align="center">Initial Management Actions</p>	<p>1. Conceptual design</p> <p>The project site selection complies with the school development plan.</p> <p>2. Engineering measures</p> <p>An independent and integral drainage system is included in the design of the Project, which will be connected with the local municipal sewage pipelines for full wastewater collection and avoiding pollution to water environment.</p> <p>3. Environmental protection measures</p> <p>Wastewater and debris generated in the construction period shall not be dumped randomly; construction in windy and rainy seasons shall be avoided or controlled to a certain scope; and actions such as fencing, covering and water spraying shall be taken to reduce dust pollution to the air environment. The key pollutants of the Project upon completion will be domestic wastewater, which will be collected and delivered via the municipal sewage pipelines to local WWTP for centralized treatment to the required standard before discharge. Domestic solid wastes will be collected for centralized disposal according to the requirements of local environmental protection authority. Therefore, little impacts will be generated on environment.</p>
<p align="center">Initial EIA Conclusion</p>	<p>The proposed project meets the requirements of national industrial policy; the project site is reasonably selected; and a series of environmental pollution control measures are taken to meet the requirements of environmental protection. With the environmental protection measures and requirements proposed in this EIA well implemented and scientifically managed, the Project, upon completion, will produce no obvious adverse impacts on the surrounding environment and, therefore, from the perspective of environmental protection, the Project is deemed, after analysis and justification, as feasible.</p>

II. Information of Respondents

Name		Gender		Age	
Occupation		Ethnic group		Education background	
Relation with the Project	Distance from your residence or office to the project site: Less than 1km <input type="checkbox"/> 1 to 2km <input type="checkbox"/> More than 2 km <input type="checkbox"/> Others, please specify <input type="checkbox"/>				
Home address					
Contact information					

Note: This table is compulsory.

III. Questionnaire Contents (Please tick the appropriate box)

(I) Your views about the environmental condition of the project site

1. What's your level of concern about local environment?

(1) Very high (2) Relatively High (3) Average (4) Zero

2. How do you evaluate the environmental condition of the project area?

(1) Very good (2) Fine (3) Average (4) Poor

3. What do you think is the most serious environmental problem in the project area?

(1) Air pollution (2) Water pollution (3) Noise pollution (4) Solid waste

pollution

(II) Your expectations on the construction project

4. Do you know about the components of the Project?

(1) Yes (2) Not very well (3) No

5. Do you think the project will benefit local economic development?

(1) Yes (2) No (3) I have no idea.

6. What do you think is the environmental problem that will produce significant impact on yourself after the Project is implemented?

(1) Air pollution (2) Water pollution (3) Noise pollution

(4) Solid waste pollution (5) No impac

7. What impacts will the project implementation produce on the environmental problems that you are not satisfied with in the project area?

(1) aggravated (2) mitigated (3) no impact

8. What's your general attitude toward the Project?

(1) supportive (2) I don't care (3) not supportive (Please explain the reason)

Please explain your reason if you are not supportive:

(III) Your comments and suggestions about the environmental protection measures

9. Do you think the environmental protection measures proposed under the Project are reasonable?

(1) Reasonable (2) Not sure (3) Unreasonable (Please explain the reason)

Please explain the reason if unreasonable:

10. Can you accept the negative environmental impacts of the Project after the environmental protection measures are taken under the proposed project?

(1) Yes, I can. (2) I am not sure. (3) No, I cannot (Please explain the reason)

Please explain the reason if you cannot accept:

11. Do you think any obstacles or problems will arise during the implementation of the environmental protection measures under the Project? What are they? If possible, please provide other comments or suggestions on environmental protection for the Project.

Questionnaire survey executive person:

Employer:

Date of questionnaire distribution:

Method of distribution: home visits; centralized distribution

Date of questionnaire recovery:

Method of recovery: home visits; centralized recovery

The questionnaire survey executive person assures that no fraudulent behavior is involved in the process of distribution, preparation and recovery of this questionnaire and shall be responsible for the authenticity of information contained therein.

Survey executive person (Signature):