Environment Monitoring Report

Project Number: 35354-013
December 2015

PRC: Lanzhou - Chongqing Railway Development Project

Prepared by Beijing OASIS Environmental Protection Technology Co., Ltd.

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New Project Developed with Loan from Asian Development Bank

New Lanzhou-Chongqing Railway Development Project

Environmental Monitoring Report

(Year 2015)

Beijing OASIS Environmental Protection Technology Co., Ltd.

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1. Preface

1.1 Project Overview

1.1.1 Route Trend & Major Technological Standards

Lanzhou-Chongqing Railway starts from Lanzhou terminal of Lanzhou city, Gansu, goes through administration areas such as Dingxi and Longnan of Gansu, Hanzhong of Shaanxi, Guangyuan, Nanchong and Guang'an of Sichuan, and Hechuan District of Chongqing, and ends at Chongqing terminal of Chongqing. A single-line railway branches out from Nanchong to Gaoxing via Guang'an. The railway line goes roughly in the south-north direction. A double-line railway, 819.975 Km in total, shall be built between Lanzhou station and Station of North of Beibei. Of it, 491.437 Km is for the section between Lanzhou and Guangyuan (not included) and 328.538 Km for the section between Guangyuan (included) and Chongqing. The length of single-line railway between Nanchong and Gaoxing via Guang'an is 93.639 Km.

The construction period of this project is 6 years and the estimated total investment for this project is RMB 78.9 billion yuan, of which, 300 million US dollars are the loan from Asian Development Bank.

The main technical standards for the main line of Lanzhou-Chongqing Railway:

Grade of railway	State railway, grade I
Number of main lines	Double-line railway for the section between Lanzhou and Chongqing and single-line railway for the section between Nanchong East and Gaoxing
Limiting Gradient	13‰ for the section between Lanzhou and Guangyuan; 6‰ for the section between Guangyuan and Chongqing and for the section between Nanchong East and Gaoxing
Target speed	200 Km/h for the section between Lanzhou and Chongqing and 160 Km/h for the section between Nanchong East and Gaoxing
Traction mode	electric power
Tractive tonnage	4000t
The minimum curvature radius	3500 m for ordinary railway section and 2800 m for difficult railway section between Lanzhou and Chongqing 200 Km/h; 2000 m for ordinary railway section and 1600 m for the difficult railway section;
Locomotive type	The section between Lanzhou and Chongqing: multi-unit passenger train, SS7E; SS7 cargo train; The section between Nanchong East and Gaoxing: SS7E passenger train and SS7 cargo train.

Effective length from arrival to departure is 850m for single engine and 880m for double engines respectively.

1.1.2 Main Content of the Project

- Total cubic meter of earth and stone for the whole line is 22880.5×$10^4$$m^3$, 17776.82×$10^4$$m^3$ for excavation, 5103.68×$10^4$$m^3$ for filling; there are 433 Super-major bridges, major bridges and medium bridges with total length of 181788 linear meters of whole line; there are 267 tunnels, 596.8Km long through the line; there are 11 tunnels more than 10Km long with length of 168Km; the track laying of main track is 819.975Km, and that for hinge and link lines is 180Km; 23 traction substations; the whole line covers land of 5218.2hm^2, land of permanent use covers 3289.7hm^2 and the land of temporary use covers 1928.5 hm^2.

- 42 new stations will be built and 15 stations will be renovated along the whole line.

- Pavements 1445.1 Km in length will be built.

- There are 324 sensitive points for noise and vibration treatment along the whole line. Besides functional replacement is needed for 115 places, acoustic barriers (40310m) or sound -insulating windows (83120m^2) will be arranged at 209 places. The total investment on noise treatment will be 202.433 million yuan.

1.2 Characteristics of this Project

Lanzhou–Chongqing Railway goes through, from the north to the south, such three geomorphic units as Loess Plateau, high and medium mountains of the Qinling Mountains and low mountain and hill zone and spans such four climate zones as the arid climate area in the mid-temperate zone of Loess Plateau, sub-humid climate zone of mid-temperate zone, North Asia tropical humid zone in the high and medium mountains in the Qinling Mountains and Middle Asia tropical humid zone in Sichuan Basin.

Along Lanzhou-Chongqing Railway, there are many kinds of vegetation. The horizontal and vertical distribution of vegetation is obvious. Roughly, Qinling Mountains taken as the dividing line, the south where the Yangtze river basin located is bio-diversified much more than the Yellow River basin. The area of water and soil erosion in the Yellow River basin, in which the railway goes through, is large, and the erosion extent is mainly medium, but for some sections it is serious or extra serious. The erosion variety takes the water conservancy erosion as the main and such gravity erosions as mud-stone flow and landslide etc. often occur in the earth and stone and mountain area. The ecological environment along the line sections in the Yangtze River basin is comparatively better, and, basically no obvious erosion or only light erosion can be seen for soil erosion.

Along the line, there are rich resources of wildings as well as cultural relics, which are mainly distributed in the natural reserves , the famous scenery and historical spots forest parks, important marshes and the cultural relic protection zones and are greatly affected by the human activities. Key protection will impose to Ancient Xiaguanying relic, ancient Shannashuzha relic, Yuhe Natural Reserve of Gansu Province, Sichuan Maozhai Natural Reserve, Wetlands Natural Reserve of Jialingjiang River Source, Myxocyorinus Asiaticus of Natural Reserve, etc.; eco-environmental protection will mainly imposed to cultural heritage, the vegetation, rare animal and land resources, etc. along the line. It is the important contents for environment monitoring work to strictly implement the relevant state laws and regulations, abide by the requirements and replies from the relevant state and local departments as well as various levels of departments for cultural relics, water conservation, forestry, environmental protection and fishing administration etc. and strictly execute the various measures specified in the EIA (environmental impact assessment) report during the construction.

The railway line crossed many big rivers including the Yellow River, the Wei River, the Tao River, the Bailong River, the Jialing River, the Fu River and the Qu River etc. Since high roadbeds will be replaced by bridges for this project, there is much bridge construction engineering for the whole line. The land occupation and disposed earth from the sub-grade for non-river-crossing bridges has certain impact on the ecological environment along the line, so has the construction of river-crossing bridges on the water quality and hydro bios of rivers.

The total earth and stone workload along this line is large and the volume of disposed earth is far bigger than the volume of taken earth, so it is vitally important to further optimize the allotment of earth and stone cubage, reduce the earth-taking and earth-disposing volumes and occupied land areas, take such preventive measures as land reclamation and afforestation etc. in accordance with the land reclamation program and design for temporary land use and prevent the generation of new land erosion.

1.3 Environment Monitoring

The environment monitoring is to supervise and inspect the execution of environmental protection measures during construction of the project on the basis of the design and environment evaluation report of this project and

to affirm the achievements, find out existing problems and give suggestions on countermeasures. The environment monitoring is to ensure the execution of the "simultaneous design, simultaneous construction and simultaneous construction" system by means of intensifying process control. It reflects the dynamic implementation status of environmental protection work on the construction site during the construction activities so as to confirm whether the relevant rules and regulations for environmental protection have been satisfied and whether the requirements from Ministry of Railways and Asian Development Bank have been met. Key points that attention should be paid to during environment monitoring include:

- Whether the environmental impact during construction is consistent with the environmental problem put forward in the environmental impact evaluation report;
- The accomplishment of environmental protection measures given in environmental impact evaluation report;
- Identify and find out any unpredicted environmental problems and put forward recommended solutions;

The environmental monitoring of Lanzhou-Chongqing Railway is taken by Beijing OASIS Environmental Protection Technology Co., Ltd. The service range is the main line of Lanzhou-Chongqing Railway from Lanzhou to North Beibei, which is 818.71 Km long in total. The cycle of environment monitoring work is the construction period of the whole line and within the two years after putting into operation after completion. For every half year of the construction period and for every year of the two years after completion, one environment monitoring report (in both English and Chinese) should be prepared by OASIS Company on the basis of the on-site survey and collected monitored data and submitted to Material Department of China Railway Corporation, Lanzhou-Chongqing Railway Co., Ltd., Planning and Statistics Department of China Railway Corporation and Asian Development Bank.

The monitoring report should contain the following content:

- Impacts on the ecological environment imposed by construction of stations, tunnels, bridges and roadbed inside key ecological environmental protection zones such as natural preservation zones, scenic spots, forest park and ancient cultural relics etc. as well as the recovery and treatment measures;
- Impacts of arrangement, protection, reclamation and afforestation measures for the spoil ground on the water and soil conservation facilities, disturbance imposed by construction to vegetation and recovery and treatment measures;
- Impacts of tunnel construction on ambient environment and implementation status of protective measures;
- Impacts on the surface water body from the bridge construction and the implementation status of preventive measures;
- The implementation and result of the protection measures for the roadbed slope.
- Impact and prevention of noise, sewage water, dust and solid waste created in the construction camps, on the pavements, on the temporary engineering site and in beam construction and storage yards and rail construction bases, and recovery measures of land for temporary use.
- Implementation status of various environment protection measures adopted for the project (including the noise prevention engineering, sewage treatment and electromagnetism, etc.).
- Propaganda on sanitation in the construction camp and health of construction personnel.

2. Brief of Engineering

2.1 Project Implementation Unit, Construction Companies and Supervisor of Lanzhou-Chongqing Railway

The project implementation unit of Lanzhou-Chongqing Railway is Lanzhou-Chongqing Railway Co., Ltd. There are 16 bid sections, 19 contractors and 13 supervisors for the project. Table 2-1 lists the contractors and supervisors for each bid section.

Table 2-1: Contractors and Supervisors of Various Bid Sections of Lanzhou-Chongqing Railway

S.N.	Bid Section No.	Contractor	Supervisor	Construction mileage	Length of bid section (Km)
1	LYS-1	China Railway 10th	Engineering Consultancy	DK30+000—	73.14

		Bureau Group Co., Ltd. and China Railway 19th Bureau Group Co., Ltd.	& Supervision Co., Ltd. of FSDI.	DK103+150	
2	LYS-2	China Railway 16th Bureau Group Co., Ltd.	Gansu Tieke Construction Supervision Co., Ltd.	DK103+150-DK173+200	69.96
3	LYS-3	China Railway Tunnel Group and China Railway 7th Bureau Group Co., Ltd.	Beijing Tiecheng Construction Supervision Co., Ltd.	DK173+200-DK259+510	83.74
4	LYS-4	China Railway 11th Bureau Group Co., Ltd. and China Railway 13th Bureau Group Co., Ltd.	Beijing Tieyan Construction Supervision Co., Ltd.	DK259+510-DK352+759	93.65
5	LYS-5	CCCC Second Highway Engineering Co., Ltd.	Supervision Company of Lanzhou Jiaotong University	DK352+759-DK391+800	33.45
6	XQLS1	China Railway 18th Bureau Group Co., Ltd.	Sichuan Tieke Construction Supervision Company	DK391+800-DK423+915 (right line)	32.11
7	XQLS2	China Railway Tunnel Group	Sichuan Tieke Construction Supervision Company	DK391+800-DK423+915(left line)	32.11
8	LYS-6	CCCC First Harbor Engineering Co., Ltd.	Inner Mongolia QinYuan Engineering Consultancy Co., Ltd.	DK423+915-DK501+005	76.94
9	LYS-7	China Railway 21st Bureau Group Co., Ltd.	Gansu Xinda Construction Supervision Co., Ltd.	DK000+000-DK30+000	29
10	LYS-8	China National Coal Group Corporation	Zhengzhou Zhongyuan Construction Supervision Co., Ltd.	DK569+385-DK577+450	8.065
11	LYS-9	China Railway 18th Bureau Group Co., Ltd.	Zhengzhou Zhongyuan Construction Supervision Co., Ltd.	DK606+710-DK615+725	9.015
12	LYS-10	China Railway Erju Group Co., Ltd.	China Railway Eryuan Engineering Consultancy & Supervision Co., Ltd.	DK615+725-DK647+300	31.575
13	LYS-11	Road and bridge construction	Beijing Fangda Construction Supervision Co., Ltd.	DK647+300-DK754+000	105.617
14	LYS-12	First Highway Engineering Bureau of CCCC	Beijing Fangda Construction Supervision Co., Ltd.	DK754+000-DK881+400	108.354
15	LYS-13	China Railway 1st Bureau Group Co., Ltd.	Henan Changcheng Construction Supervision Co., Ltd.	ID2K770+955.51-ID2K860+092	Not within the monitoring range
16	LYS-14	China Railway 10th Bureau Group Co., Ltd.	Beijing Tiecheng Construction Supervision Co., Ltd.	DK881+400-DK952+110.299	70.713

2.2 Engineering Progress

The construction kickoff meeting for this railway line was held on September 26, 2008, on which the construction of this project starts officially. In October 2008, construction of 28 Km-long Xiqinling Tunnel started, which is the control project of the whole line; in March 2009, Xiaguanying-Guangyuan section started for construction; in July 2009, the bidding documents for Guangyuan-Chongqing section were opened and the contractors concerned arrived at the site; in September 2009, commencement began in succession in all construction and supervision bid sections. At present, the Gaoxing Branch line had been completed, the section from Weituo to Chongqing had been cut through on Dec. 30, 2014; The static and dynamic acceptance has been completed. The section from Guangyuan to Weituo of Lanzhou-Chongqing Railway, being implemented the joint debugging and testing and is expected to be cut through at the end of this year. At present, the main engineering of Lanzhou-Chongqing Railway in 2015-2016 is the construction for a small amount of difficult tunnels and the remaining track-laying engineering caused by a small amount of tunnels not cutting through.

Refer to Table 2-2 and Table 2-3 for the completed workload of the project along whole line and the completion status of key engineering, Xiqinling Tunnel by October 25, 2015.

As the residual engineering workload of Lanzhou-Chongqing Railway is not large and has small influences on the surrounding environment, the environmental monitoring report in 2015 and 2016 shall be submitted and reported to Asian Development Bank, China Railway Corporation and Lanzhou-Chongqing Railway Company in a form of annual report.

Table 2-2: Summary of Completed Engineering Works

Name		Unit	Designed Workload	Qty. Completed since Construction Commencement	Proportion of Completed Volume in Design (%)
Investment		10000 Yuan	9923808	9056706	91.26
Earthwork for roadbed		$1\times10^4m^3$	15536.5	14363.4	92.4
Bridges	Super-major, major and medium bridge	Linear meters	229280	223639.5	97.5
Tunnels		Meters of finished hole	611157	608034.5	99.5
Installing rail		km	2633.3	1855.8	70.5

Table 2-3: Completion Details of Key Tunnels

Tunnel name	Designed Length (m)	Qty. Completed since Construction Commencement (Meters of finished hole)	Completion Rate (%)
Xiqinling Tunnel	28236	28225	99.96

3. Environmental Management

3.1 Environmental Management System

As the implementation unit of this railway line, Lanzhou-Chongqing Railway Co., Ltd. is responsible for the environmental protection of this line. The Environmental Protection Bureaus of Gansu (Lanzhou, Dingxi and Longnan cities), Shanxi (Hanzhong city), Sichuan (Guangyuan, Nanchong and Guang'an cities) and Chongqing (Hechuan District) are responsible for supervision and management of environmental protection in their respective jurisdiction regions.

Environmental monitoring for main line of Lanzhou-Chongqing Railway shall be undertaken by Beijing OASIS. The contractors and supervisors are responsible for daily monitoring and supervision during construction. The implementation unit and OASIS are responsible for collection of monitoring data, and then OASIS shall compile the environmental monitoring report and submit it to China Railway Corporation and Asian Development Bank. The environment monitoring procedures for this railway line are shown in block diagram 3-1.

According to the characteristics of this project and frequent environmental problems in the construction, the monitoring unit advises to conduct the environmental protection and management from the following aspects:

- Advise the project management department of each bid section to have the full-time (part-time) worker for environmental protection. They need the pre-posting training of environmental protection, take charge of supervising and managing the environmental problem during construction process, and assist environmental administrative department to do well the environmental protection work.

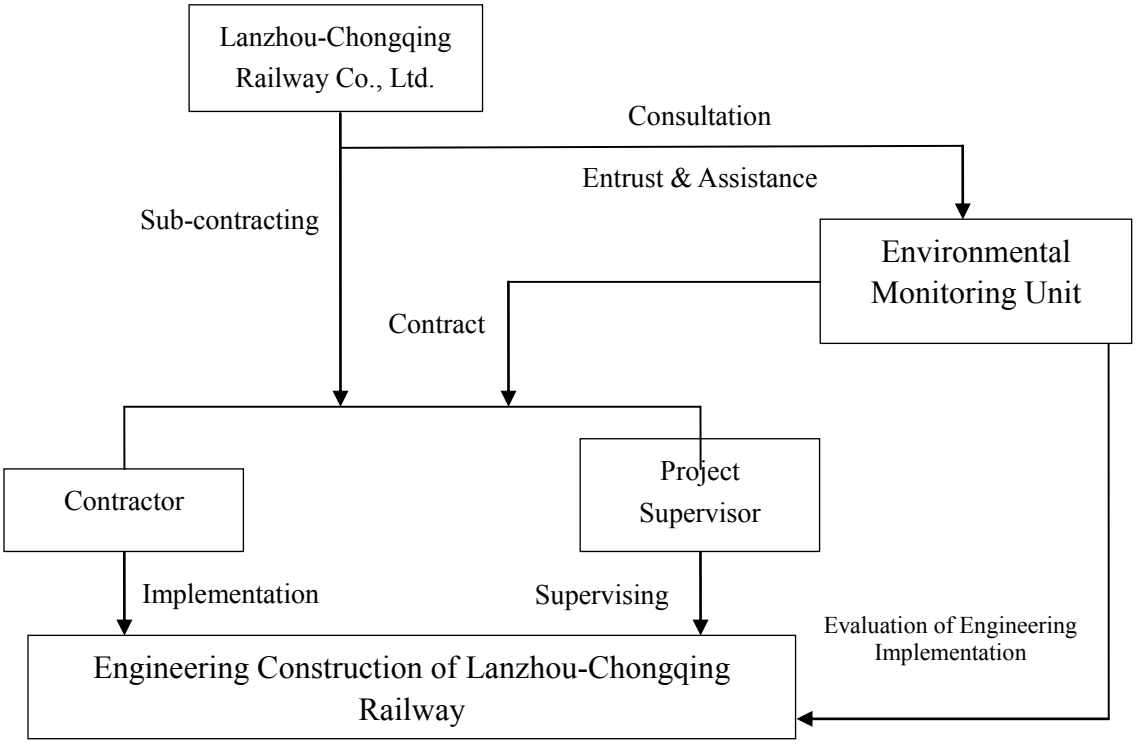

Figure 3-1: Block Diagram of Environment Monitoring Procedures

Notes:

Lanzhou-Chongqing Railway Co., Ltd.: As the implementation unit, entrust the supervisors to complete the whole –line monitor to the project, and when the contract is awarded, they will enter into the agreement regarding environmental protection requirements with the contractors and supervisors.

Contractor: Implement the project and environmental protection as required in the contract.

Supervisor: It supervises the engineering quality and environmental protection processing according to contractual requirements.

Environmental monitoring unit: As an external monitoring unit, it evaluates the implementation of environmental engineering and submits the monitoring reports to Lanzhou-Chongqing Railway Co., Ltd., China Railway Corporation and Asian Development Bank.

- Each contractor is advised to fulfill the corresponding promise of environmental protection in construction contract. Formulate corresponding measures for environmental protection pursuant to the environmental protection requirements specified in the design document, protect the environment around construction site, and avoid and reduce environmental pollution or damage due to improper methods of construction. Upon occurrence of environmental damage, adopt measures actively for treatment, and invite relevant experts and units immediately for solution if independent solution is not available.

- The supervisor is required to be responsible for daily environmental monitor work in accordance with the environmental protection requirements under the construction contract. Once an environmental problem occurs during the construction, it should urge the relevant contractor to solve it and include the environmental protection into the engineering quality supervision system.

3.2 Environment Management of Lanzhou-Chongqing Railway Co., Ltd. in 2015

3.2.1 Monitoring of Water and Soil Conservation

In 2015, Lanzhou-Chongqing Railways Co., Ltd. continued to entrust the Scientific Institute of Water and Soil Conservation of Gansu Province, Gansu Green Ecological Engineering Consulting Co., Ltd., Sichuan Provincial Water and Soil Conservation Ecological Environmental Monitoring Centre and Chongqing Water and Soil Conservation Ecological Environmental Monitoring Centre to conduct the monitoring for the water and soil conservation of the engineering of the newly built railway from Lanzhou to Chongqing and the monitoring work report of water and soil conservation in 2015 has been completed at present.

The existing problems and suggestions proposed in the report on Lanzhou-Chongqing Railways in 2015 (Gansu Section) are as follows:

The retaining and blocking measures for spoil grounds mainly are to set up the retaining walls for the discarded slag, however, the quantity of the retaining walls are not enough and the individual retaining wall cannot meet the requirements of blocking. The implementation unit is recommended to clearly propose this requirement to the construction side again, that is, the construction side shall restore and build the slag retaining walls (or blocking dregs dam) that meet the requirements of water and soil conservation and engineering safety on all the spoil grounds during the construction period of engineering.

（1） In 2014, grading slope, decelerating slope, rolling and flattening slag surface, and building slope protection are done to part of super high spoil grounds. But still several slope of spoil ground is too steep and high. It is recommended to decelerate the slope and reduce the height.

（2） Borrow pit is not fully rectified, flattening and protection measures are seriously delayed. It is recommended for the using borrow pits, blocking, interception and drainage measures should be taken, for the borrow pits that are no longer used, flattening, recultivation and vegetation restoration measures shall be taken.

（3） The contractor shall strengthen waste slag protection.

（4） It is recommended that the construction side strengthen advocation of soil and water conservation. Not only the responsible personnel should be clear but also all administrators and construction site personnel should know the meanings and responsibilities of soil and water conservation and should consciously do well the soil and water conservation work.

（5） Interception and drainage measures of the spoil ground are not perfect. It is recommended to pay attention to the spoil ground protection and build interception and drainage project conforming to the rquirements of soil and water conservation thereafter.

（6） For the spoil grounds and borrow pits whose discarding and borrowing work have been completed, not only the blocking measures shall be completed in time, but also the land reclamation shall be done in time in

future work. The Reclamation shall be done by the owner (or unit) according to the greening requirements.

（7） The catchment area of part of channels and spoil grounds is relatively large, waste lag location and pile method are not reasonable, interception and drainage, and blocking methods are missing or damaged, therefore, there is the possiblity of debris flow and water and soil loss disasters. The implementation unit is recommended to build protection measures, and clean and move the spoil ground whose location is not proper.

（8） The implementaiton unit is recommended that the construction unit perfect the construction design and alternation procedures of soil and water conservation.

The problems and advice presented in the 2015 Report on Lanzhou-Chongqing Railway (Shanxi section):

（1） The main blocking measure of the spoil ground is using waste slag for the retaining wall. But the quantity is not enough and some parts cannot meet the blocking requirements, of which Wangjiahe Tunnel entrance 2 spoil ground still has no blocking measures at all. As per the principle and requirements of blocking first and discarding second, before discarding any waste slag into the spoil ground, the blocking project shall be built first. It is recommended the implementation unit clearly put forward the requirements to the construction side, that blocking walls (or blocking dregs dam) conforming to the requirements of soil and water conservation and engineering safety should be built in all spoil grounds.

（2） Waste slag of the Shangyuanli Tunnel is discarded along the river, and there is no slag blocking embankment or blocking wall, and there is serious soil and water loss. It is recommended that the contractor should promptly clean up and build the slag blocking embankment to strengthen the protection of waste slag.

（3） There is no blocking project and interception and drainage project built for Wangjiahe Tunnel entrance 2 spoil ground, meanwhile, the waste slag slope is too steep and too high and there is the possibility of instability and collapse, which causes serious hidden danger. It is recommended that the implementation unit request contractor immediately make rectification, build blocking project and interception and drainage project conforming to requirements, grading slop and decelerating slope as per the design requiremnts.

（4） Part of tunnel is used for slag tapping during building the pioneer road and slag transportation road. A part of sideroad slope is going through earth-debris flow, which destructs the vegetation and the vegetation is flowed into the channel and causes damages. It is recommended the implementation unit build blocking project at the slope toe and clean up and rectify.

（5） It is recommended the construction unit strengthen advocation to soil and water conservation. Not only the responsible personnel should be clear but also all administrators and construction site personnel should know the meanings and responsibilities of soil and water conservation and should consciously do well the soil and water conservation work.

3.2.2 Work Progress of environmental and water protection of Lanzhou-Chongqing Railway Co., Ltd.

I. Environmental management work of the Guangyuan to Weituo section during operation period

After Lanzhou-Chongqing Railway (Guangyuan to Weituo section) is completed, Lanzhou-Chongqing Railway Co., Ltd. will entrust operations management to Chengdu Railway Bureau for unified management according to the territorial principle. Chengdu Railway Bureau has a complete environmental management system to supervise and control the whole railway administrations of the environmental protection work. Environmental protection and energy-saving emission reduction work of Chengdu Railway Bureau is seperately controlled by the chief engineer and the railway administration leader, specifically by setting energy conservation and environmental protection office (section) under the plan census and statistics department, and equipping with full-time management personnel.

II. Static acceptance of the environmental and water protection project

The static acceptance team of the environmental and water protection project, which is formed by Chengdu Railway Bureau and Lanzhou-Chongqing Railway Co., Ltd., conducted static preliminary acceptance during July 20~ 25, 2015, and conducted static review during August 20~25, 2015.

III. Conclusion on the static acceptance:

The design documents, environmental impact report, soil and water conservation plan and the determined environmental protection and water and soil conservation measures in the reply have been basically completed for the newly-built Lanzhou-Chongqin railway (Guangyuan to Weituo section), which meets the design requirements

and acceptance criteria and meets the static acceptance and joint adjustment requirements. At present, the static acceptance report has been reviewed by Chengdu Railway Bureau.

IV. Under the construction of Lanzhou-Chongqin Railway, according to *Laws and regulations of Environmental Impact Report*, Comments of Examination, *Environmental Protection of the Construction Project*, etc., Lanzhou-Chongqin Railway Co., Ltd. strictly executes simultaneous design, simultaneous construction and simultaneous construction of the environmental protection project and the main project, uses environment impact assessment to guide the design, construction and enviromental management principle, establishes environmental protection system, conscientiously implements the environmental protection measures, strengthens the process control, and consciously accepts the supervision from environmental protection departments of the governments at all levels, makes efforts to mitigate and reduce the impact of construction on the ecological environment, and strives to build Lanzhou-Chongqin Railway into a resource-saving and environmental friendly railway.

4. Supervision and Inspection of Affected Points

On October 5, 2015, OASIS Environmental Protection Technology Co., Ltd. submited the Executive Plan for Environmental Monitoring and Survey of Lanzhou-Chongqing Railway for 2015 to Lanzhou-Chongqing Railway Co., Ltd., reporting the key points and the executive plan of this monitoring activity.

From November 2 to 11, 2015, Jiao Jvsheng coming from the company who is accompanied by Wu Wanyong, the Engineer of Engineering Department of Lanzhou-Chongqing Railway Co., Ltd., inspected several construction sites of bid sections along the whole line, mainly for 23 spoil grounds and 6 super major and major bridges, 4 subgrades, 8 stations, 6 environmental protection facilities, 3 campsite temproray ground, 50 work sites in total.

Primary work sites inspected were as follows:

Borrow pits and spoil ground (23 sites):

Donggulu Spoil Ground; spoil ground at exit of Mount Shouyang Tunnel; spoil ground at exit of Longjiamen Tunnel; Muzhailing Tunnel Taiping Spoil Ground with rail; Luzha newly added spoil ground of Muzhailing Tunnel; spoil ground at exit of Zhifang Tunnel; Xinchengzi Tunnel Taishuigou Spoil Ground; Luotuoxia Spoil Ground; spoil ground at exit 2 of Tianchiping Tunnel; spoil ground at exit 1 of Tianchiping Tunnel; spoil ground at exit of Huama Tunnel; Jugan Tunnel Hengdong spoil ground; Dayuanba Spoil Ground; Ligouyuan Spoil Ground at exit of West Qinling; spoil ground at entrance of Yangjiashan Tunnel; Guanziling Tunnel Spoil Ground; Taoshuping Tunnel 2# Spoil Ground; spoil ground at exit of Xiongdongwan Tunnel; 2#spoil ground at exit of Xiongdongwan Tunnel; 1#spoil ground at exit of Xiongdongwan Tunnel; spoil ground at entrance of Meilingguan Tunnel; spoil ground at entrance of Xuanzhenguan Tunnel; DK712+400 subgrade of spoil ground.

Bridge (6 sites):

Taohe River 2# Super Major Bridge; Yayuan Super Major Bridge; Chenjiaba Super Major Bridge；Bailongjiang 3# Super Major Bridge； Mujiajiao Miaozigou Double Track Major Bridge.

Subgrades (4 sites):

Subgrade at exit of Mount Shouyang Tunnel; DK136+376 cutting; DK712+410 subgrade; DK712+270 cutting.

Stations (8 sites)

Weityuan Station; Zhangxian Station; Longnan Station; Yaodu Station; Langzhong Station; Nanchong Station;Wusheng Station; Hechuan Station.

6 environmental protection facilities:

Taigong Station s-300 Constructed Wetlands; sound barrier of DK711+814~712+080 Wangyue Major Bridge; sound barrier of DK712+080~712+190 subgrade; Constructed Wetlands Project of Nanchong North Station; Constructed Wetlands Project of Wusheng Station; Constructed Wetlands of Hechuan Station.

3 construction sites for temproray-use

Construction living quarters at exit of Longjiamen Tunnel; Taishuigou camp buildings at Xinchengzi Tunnel; Fourth Division Campsite of China Railway 10th Bureau Group Co., Ltd.

This report is the environment monitoring and evaluation report of Lanzhou-Chongqing Railway of Year 2015.

Compiled by: Jiao Jvsheng

4.1 Implementation Details of the Environmental Protection Measures of All Bid Sections

Refer to Tables 4-1 to 4-18 for 2015 environmental protection conditions of the bid sections.

Table 4-1: Implementation Details of Environmental Protection of Various Bid Sections (LYS-1-1)

Contractor: Project management department of Lanzhou-Chongqing Railway of Second Engineering Co., Ltd. of China Railway 10th Bureau Group Co., Ltd.				Supervisor: Supervision Company of Engineering Limited Liability of FSDI, Gansu		
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Sandunying Village, Gancaodian Town	For centralized treatment	Treatment in settling basin	5	163	Rent

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Entrance of Nanping Tunnel	DK61+966～DK64+159.5	2193.5	DK61+300

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Super – major Bridge over Wanchuan River in Xujiatai	DK34+587～DK35+383	796	They are collectively stored for roadbed engineering.
	Super-major Bridge over Wanchuan River in Jiejiazui	DK36+127～DK37+172	1045	They are collectively stored for roadbed engineering.
	Super-major Bridge over Wanchuan River in Qingshui Township	DK40+075～DK41+068	992	They are collectively stored for roadbed engineering.
	Super-major Bridge over Wanchuan River in Gancaodian	DK47+096～DK48+380	1282	They are collectively stored for roadbed engineering.
	Major Bridge in Lijiamo	DK53+911～DK54+097	Finished	The discarded soil is used for constructing access road.
	Major Bridge in Qvercha	DK61+091～DK61+225	135	The discarded soil is used for constructing access road.

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
	Spoil ground at entrance of Nanping Tunnel	DK61+300	$3.5\times10^5m^3$, 87.6mu, retaining wall	35	Retaining wall and slope protection has been completed.
Investigation Situation					

Table 4-2: Implementation Details of Environmental Protection of Various Bid Sections (LYS-1-2)

Contractor: Engineering project department of Lanzhou-Chongqing Railway of China Railway 19th Bureau Group Co., Ltd.	Supervisor: Supervision station of Lanzhou-Chongqing Railway of Supervision Company of Engineering Limited Liability of FSDI, Gansu

	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
Construction Camp	Yinchuan Village in Longquan Township of Yuzhong County	Deposit in category and at fixed point.	Set sewage sedimentation tank.	37	48	Self-built
	Luozitan Village in Longquan Township of Yuzhong County	Deposit in category and at fixed point.	Set sewage sedimentation tank.		62	Self-built
	Changfeng Village in Fuchuan Town of Anding District	Deposit in category and at fixed point.	Set sewage sedimentation tank.		650	Self-built
	Miliang Village in Fuchuan Town of Anding District	Deposit in category and at fixed point.	Set sewage sedimentation tank.		214	Self-built
	Wenchang Village in Neiguan Town of Anding District	Deposit in category and at fixed point.	Set sewage sedimentation tank.		119	Self-built
	Baitupo Village in Qinqi Township of Weiyuan County	Deposit in category and at fixed point.	Set sewage sedimentation tank.		41	Self-built

	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
Tunnel longer than 1000 m	Exit of Nanping Tunnel	DK65+733～DK63+850	1573	Spoil ground at exit
	Shangxinzhuang Tunnel	DK68+260～DK66+228	2032	To the spoil ground of the tunnel
	Humaling Tunnel	DK68+626～DK80+400	12760	To the spoil ground of the tunnel
	Jvtou Tunnel	DK82+666～DK84+622	2070	To the spoil ground of the tunnel
	Heishan Tunnel	DK84+955, 8～DK100＋707	15757	To the spoil ground of the tunnel

	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
Super-major Bridge, Major Bridge	Zhoujiagou Major Bridge	DK65+946～DK66+150	204	Unified collection; and discarded to spoil ground
	Major Bridge over Kuhe River	DK82+302～DK82+550	248	Unified collection; and discarded to spoil ground

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Exit of Nanping Tunnel	400m on right side of DK65+733	$26.5\times10^4m^3$, 48.7 mu	18.9	Masonry completed

	Entrance of Shangxinzhuang	800m on left side of DK66+228	$14.2\times10^5m^3$, 32mu	14.2	Completion of building
	No.1 entrance of Humaling	DK68+300	$12.6\times10^4m^3$, 26mu, recultivation and afforestation	11	Completion of building Under restoration
	No.2 entrance of Humaling	DK68+300	$11.7\times10^4m^3$, 16 mu Recultivation and afforestation	10.4	Completion of building Under restoration
	No.3 entrance of Humaling	DK68+550	$30.5\times10^4m^3$, 70 mu Afforestation	19.7	Completion of building Under restoration
	Poshang Inclined Shaft	1300m on right side of DK71+900	$31\times10^4m^3$, 158mu	35.4	Masonry completed
	Inclined shaft No. 1 and 2 of Lvzigou	1100m on right side of DK73+800	$46\times10^4m^3$, 115mu	46	Completion of building
	Donggulu Inclined shaft	766m on left side of DK77+830	$33.6\times10^4m^3$, 63mu	33.4	Under construction
	Inclined shaft of Xiedishan Mountain	700m on left side of DK79+500	$33\times10^4m^3$, 25mu	37.4	Under construction
	Exit of Humaling	200m on right side of DK85+200	$28.8\times10^4m^3$, 82mu	19.8	Masonry completed
	Entrance of Jvtou	200m on left side of DK82+550	$10\times10^4m^3$, 45mu	6.7	Masonry completed
	Exit of Jvtou	1500m on right side of DK85+600	$18\times10^4m^3$, 45mu	18	Under construction
	Entrance of Heishan Mountain	1200m on left side of DK85+000	$60\times10^4m^3$, 73mu	36.3	Under construction
	Inclined shaft of Lvjiatan	1500m on left side of DK90+945	$50\times10^4m^3$, 141mu	62.1	Under construction
	Inclined shaft No. 1 of Hongzhuang	80m on left side of DK92+700	$13\times10^4m^3$, 20mu	13	Masonry completed
	Inclined shaft No. 2 of Hongzhuang	400m on left side of DK93+900	$32\times10^4m^3$, 70mu	32	Masonry completed
	Inclined shaft No. 1 of Yanjiaping	Ditch on left side of DK95+800	$44.4\times10^4m^3$, 76mu	44.4	Masonry completed
	Exit No. 1 and 2 of Heishan Mountain	On left side of DK101+350	$45\times10^4m^3$, 124mu	37.9	Masonry completed
Investigation Situation	Donggulu Spoil Ground Waste slag is completed, according to the requirements of Department of Water Resources of Gansu Province's Approval Letter on Impacts of Lanzhou-Chongqing Railway Humaling Tunnel 3# and 5# Inclined Shaft Spoil Ground on the Safe Operation and Design Plan of Eliminating and Reinforcement of the Silt Dam, retaining wall is built, spillway at the top of the spoil ground is built, and the ground is flattened.				

Table 4-3: Implementation Details of Environmental Protection of Various Bid Sections (LYS-2)

Contractor: China Railway 16th Bureau Group Co., Ltd.			Supervisor: Gansu Tieke Construction Engineering & Supervision Co., Ltd.			
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Beizhai Town, Weiyuan Couty	Transport to the designated location for burying.	Periodically clean after sedimentation	12	460	Self-built
	Yufeng village, Qiaoyu Township	Transport to the designated location for burying.	Sedimentation tank , septic tank	With environmental protection on bulletin board	132	Self-built
	Gujiping Village, Lianfeng Town	Transport to the designated location for burying.	Sedimentation, filtration	5	27	Self-built
	Shagou Village in Yihuqiao Township of Zhang County	Transport to the designated location for burying.	The camp has a sedimentation tank , septic tank and With Water Drainage Facilities	With environmental protection on bulletin board	35	Self-built
	Zhulingou Village in Yihuqiao Township of Zhang County	Transport to the designated location for burying.	The camp has a sedimentation tank , septic tank and With Water Drainage Facilities	With environmental protection on bulletin board	100	Self-built
	Gujiping Village, Lianfeng Town, Weiyuan County	Transport to the designated location for burying.	The camp has a sedimentation tank , septic tank and With Water Drainage Facilities	With environmental protection on bulletin board	85	Self-built
	Jinzhong Town, Zhang County DK160+350	Setting up solid garbage basin for land-filling	The camp has a sedimentation tank , septic tank	Available	17	Self-built
	DK162+777 in Jinzhong Town of Zhang County	Setting up solid garbage basin for land-filling	The camp has a sedimentation tank , septic tank	Available	90	Self-built
	DK163+206 in Jinzhong Town of Zhang County	Setting up solid garbage basin for land-filling	The camp has a sedimentation tank , septic tank	Available	90	Self-built
	DK168+100 in Dacaotan Township of Zhang County	Setting up solid garbage basin for land-filling	The camp has a sedimentation tank , septic tank	Available	31	Self-built
	Sixth branch of Lanzhou-Chongqing Railway	Centralized processing and burning in the waste collection pool	Sedimentation tank	Available	40	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Caojiagou Tunnel	DK104+955~DK108+903	3948 (Cut through)	Spoil ground at entrance and exit of Majiapo
	Majiapo Tunnel	DK113+222~DK119+052	5562	Spoil ground at entrance and exit of Caojiagou
	Kezhai Tunnel	DK121+380 -DK122+970	1590 (Cut through)	Kezhai Tunnel Dumping Site

	Yangjiawan Tunnel	DK130+615- DK133+270	2655 (Cut through)	Discard waste slag in the Dumping Site of Qiaoyu Township
	Longjiamen Tunnel	DK133+635~DK136+200	2565 (Cut through)	Spoil ground at entrance and exit of Longjiamen
	Shouyangshan Tunnel	DK137+214~ DK141+019	3805 (Cut through)	Spoil ground at entrance and exit of Shouyang Mountain
	Gujiping Tunnel	DK142+310~ DK151+500	9190 (Cut through)	Spoil ground at entrance and exit of Gujiping
	Hujiawan Tunnel	DK153+005~DK155+867	2862 (Cut through)	Spoil ground at entrance and exit of Hujiawan
	Houshanping Tunnel	DK156+130~ DK162+777	6647 (Cut through)	Spoil ground at entrance and exit of Houshanping
	Dongzhagou Tunnel	DK163+206~DK171+410	8204 (Cut through)	Spoil ground at entrance and exit of Dongzhagou and spoil ground of inclined shaft in Huigou

	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
Super-major Bridge, Major Bridge	Qinqihe Major Bridge	DK103+914.52~DK104+294.35	379.83 (Completed)	
	Nuanyanggou Super-major Bridge	DK108+915.75~DK110+439.95	1524.2 (Completed)	
	Baijiawan Major Bridge	DK111+094.55~DK111+261.47	166.92 (Completed)	
	Madiwan Major Bridge	DK112+197.65~DK112+372.35	174.7 (Completed)	
	Super-major Bridge over Cuijia River	DK119+191.7～DK121+325.74	2134.4 (Completed)	Discarded to spoil ground of Cuijia River
	Super-major Bridge over Qingyuan River	DK123+151.87～DK124+197.7	1045.83 (Completed)	Discrded to spoil ground at exit of Kezhai
	Super-major Bridge over Qiaoyu River	DK125+735.61~DK128+478.80	2743.19 Completed	Discarded to spoil ground of Qiuyuhe River
	Super-major Bridge over Puchuan River	DK136+547.83～137+214.17	633.4 (Completed)	Discarded to spoil ground at entrance of Shouyang Mountain
	Tiegouhe Major Bridge over River in Zhoujiazhuang	DK151+506.8～DK151+845.2	338.38 (Completed)	Discarded to: spoil ground of Gujiping Tunnel
	Dongzhagou Major Bridge	DK162+820~DK163+206	386 (Completed)	
	Dacaotan Major Bridge	DK172+464.8~DK172+589.2	124.34 (Completed)	

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Entrance of Caojiagou Tunnel (spoil ground)	60m on right side of DK104+955	$26.7\times10^4m^3$, 34.6mu, and recultivation and afforestation	26.7	Retaining wall completed
	Exit of Caojiagou Tunnel (spoil ground)	50m on left side of DK108+900	$26.5\times10^4m^3$, 37.9mu, and recultivation and afforestation	26.5	Retaining wall completed
	Entrance of Majiapo Tunnel (spoil ground)	70mm on right side of DK113+200	$39.3\times10^4m^3$, 147mu, and recultivation and afforestation	35.3	Retaining wall completed
	No 1 exit of Majiapo Tunnel (spoil ground)		$12.7\times10^4m^3$, 18.9mu, and recultivation and afforestation	10	Retaining wall completed
	2# Inclined shaft (abandoned) at Majiapo Tunnel		$15\times10^4m^3$, 20.9mu, and recultivation and afforestation	15	Retaining wall completed
	Exit of Majiapo Tunnel (spoil ground)	90m on right side of DK118+920	$39.3\times10^4m^3$,100mu, and recultivation and afforestation	39.3	Retaining wall completed
	Entrance of Kezhai Tunnel	400m on left side of DK121+600	$11\times10^4m^3$, 32mu, 30mu recultivated	14	Retaining wall completed
	Exit of Kezhai Tunnel	200m on left side of DK123+100	$11\times10^4m^3$, 41 mu	15	Retaining wall completed
	Entrance of Yangjiawan Tunnel	On right side of DK131+900	$19.2\times10^4m^3$, 54 mu	26	Retaining wall not built
	Exit of Yangjiawan Tunnel	On left side of DK133+300	$19.2\times10^4m^3$, 128 mu	40	Retaining wall completed
	Entrance of Longjiamen Tunnel	200m on right side of DK133+635	$17.3\times10^4m^3$, 66mu	40	Retaining wall under construction
	Spoil ground at exit of Longjiamen Tunnel	200m on left side of DK136+200	$20\times10^4m^3$, 57mu, and recultivation and afforestation	20	Retaining wall completed
	Entrance of Shouyang Mountain Tunnel	200m on left side of DK137+214	$30\times10^4m^3$, 96mu, and recultivation and afforestation	30	Retaining wall Completed
	Spoil ground at exit of Shouyang Mountain Tunnel	300m on right side of DK141+019	$30\times10^4m^3$, 100mu, and recultivation and afforestation	30	Retaining wall completed
	Entrance of Gujiping Tunnel	300 m on right side of DK142+310	$2.8\times10^5m^3$, 71mu	28	Retaining wall is not built.
	Xuegou Inclined shaft	DK144+800	$45\times10^4m^3$, 65mu, recultivation and afforestation	45	Retaining wall completed
	Exit of Gujiping Tunnel	500m on left side of DK151+500	2.835×10^5 m^3, 100mu, 50mu recultivated, and afforestation	46.5	Retaining wall Completed

	Entrance of Hujiawan Tunnel	300m on right side of DK153+005	49.2×10^{4}m^3, 60mu, 50mu recultivated, and afforestation	43	Retaining wall Completed
	Tizigou Inclined Shaft	200m on right side of inclined shaft opening	5.025×10^{5}m^3, 50mu	46.5	Retaining wall Completed
	Entrance of Houshanping Tunnel	1000m on right side of DK156+120	46.1×10^{4}m^3, 100mu, 73mu recultivated, and afforestation	46	Retaining wall Completed
	Exit of Hujiawan Tunnel	1000m on left side of DK156+120	20×10^{4}m^3, 50mu, and recultivation and afforestation	20	Retaining wall Completed
	Houshanping Tunnel Inclined shaft	DK160+359	2×10^{5}m^3, 20mu, 54mu recultivated, and afforestation	20	Retaining wall under construction
	Exit of Houshanping Tunnel	DK162+777	46.5×10^{4}m^3, 72mu, 54mu recultivated, and afforestation	46.5	Retaining wall Completed
	Entrance of Dongzhagou Tunnel	DK163+206	35.5×10^{4}m^3, 51mu, 68mu recultivated, and afforestation	35.5	Retaining wall under construction
	Huigou Inclined Shaft of Dongzhagou Tunnel	DK168+100	41.7×10^{4}m^3, 65mu, 56mu recultivated, and afforestation	41.7	Retaining wall under construction
	Shizuigou Dumping Site		3,750,000 m^3, 62mu, greening slope of recultivation	37.5	Retaining wall under construction
Investigation Situation	Subgrade at exit of Mount Shouyang Tunnel, spoil ground at exit of Mount Shouyang Tunnel, DK136+376 cutting, construction living quarters at exit of Longjiamen Tunnel, spoil ground at exit of Longjiamen Tunnel, Weiyuan Station, and Zhangxian Station. The greening arch skeleton of the subgrade at exit of Mount Shouyang Tunnel is completed. Retaining wall is built and surface preparation of the drainage ditch is completed in the spoil ground at exit of Mount Shouyang Tunnel. The greening arch skelet of the DK136+376 cutting slope is comppleted. Cultivation of the construction living quarters at exit of Longjiamen Tunnel is restored. Spoil ground at exit of Longjiamen Tunnel is cleaned up. Subgrade of Weiyuan Station is completed. Main construction of station building at Weiyuan Station. Greening grid at the slope of subgrade of Zhangxian Station is completed. Main construction ofplatform of Zhangxian Station.				

Table 4-4: Implementation Details of Environmental Protection of Various Bid Sections (LYS-3-1)

Contractor: Engineering headquarters of LYS-3 section of China Railway Tunnel Group			Supervisor: Supervision station of Lanzhou-Chongqing Railway of Beijing Tiecheng Construction Supervision Co., Ltd.			
	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
Construction Camp	Entrance of Muzhailing Tunnel (Jiudianzi Village of Dacaotan Township)	Set up the garbage treatment pond, and specific person cleans and buries it regularly.	Set up sedimentation tank and septic tank; clean it regularly; the ditch is open.	5	125	Self-built
	Shijvgou Inclined Shaft of Muzhailing Tunnel (Shijvgou Village of Dacaotan Township)	Set up 2 garbage treatment ponds in the living quarters, and specific person is arranged to clean and bury it regularly.	Set up sedimentation tank and septic tank; clean it regularly; the ditch is open.	9	379	Self-built
	Daping Inclined Shaft of Muzhailing Tunnel (Daping Village of Dacaotan Township)	Set up 1 garbage treatment pond in the living quarters, and specific person is arranged to clean and bury it regularly.	Set up sedimentation tank and septic tank; clean it regularly; the ditch is open.	8	297	Self-built
	Nanshuigou and Daping Inclined Shaft with rail	Centralized land-filling	Treating wastewater in sewage settling tank	8	93	Self-built
	Mozha Inclined Shaft	Digging pits for burying	After being settled in two stages, discharging into flood relief channel	6	112	Self-built
	Dazhangou of Meichuan Town in Min County	Burying after sterlization	Production wastewater is discharged after three-stage filtration and settlement; domestic wastewater is discharged after treatment in septic tank	3	78	Self-built
	Dengjiamo in Hadapu Town of Dangchang County	Land-filling after being burnt	Being settled in settling tank for recycling	9	60	Self-built
	Shangluo Village in Hadapukai Town of Dangchang County	Deeply buried for treatment	Settled for treatment	7	164	Self-built
	Entrance of Tongzhai Tunnel	Building garbage treatment yard, arranging special person for clearing and returning it to the tank in time	Treating construction wastewater through settling tank and sewage treatment tank	6	236	Self-built

	Exit of Qinggang Tunnel	Building garbage treatment yard, arranging special person for clearing and returning it to the tank in time	Treating construction wastewater through settling tank and sewage treatment tank	8	255	Self-built
	Jiahe Township in Dongchang County of Longnan City of Gansu Province	Building garbage treatment tank to burn solid wastes before deep burying.	Implementing three-stage treatment before discharging	7	8	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Muzhailing Tunnel	DK173+280-DK192+375 (Left)-DK192+395(Right)	36715	10 spoil grounds of each carve opening and inclined shaft
	Hadapu Tunnel	DK233+000-237+086 DyK233+000-237+086	8172	Spoil ground of inclined shaft in Dengjiamo
	Majiashan Tunnel	DK239+696-DK247+131	7435	Spoil ground at entrance and exit and that of inclined shaft in Shangluo
	Tongzhai Tunnel	DK247+308-DK256+135	8464	Spoil ground at entrance and exit and that of inclined shaft in Xiaduogou
	Qinggang Tunnel	DK256+440-DK259+490	3050	Spoil ground at entrance and exit

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Major Bridge over Qiumohe River	DK239+328～DK339+632	350	After sedimenting in slurry pond, discard to the pointed place for treatment.
	Major Bridge over Lichuanhe River	DK247+120～DK247+299.4	160	
	Youfanggou Major Bridge	DK256+135～DK256+440	180	

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
	Entrance of Muzhailing Tunnel	100m on right side of DK173+500	59.2×10^4 m^3, 62mu, recultivation and afforestation.	37	Retaining wall completed
	Shijvgou Inclined Shaft	300m on right side of DK175+800	$31.9\times10^4m^3$, 60mu, recultivation and afforestation	47.4	According to construction progress, the partial retaining engineering has been built.
	Daping Inclined Shaft	1500m on left side of DK177+000	$6.27\times10^5m^3$, 105mu, recultivation and afforestation	36.2	According to construction progress, the partial retaining engineering has been built.
	Daping Inclined Shaft with rail	600m on left side of DK179+600	$6.27\times10^5m^3$, 105mu, recultivation and afforestation	28.3	The land acquisition has not been finished and retaining wall is to be built.
	Nanshuigou Inclined Shaft with rail	600m on left side of DK183+600	$2.61\times10^5m^3$, 63mu, recultivation of 50mu and afforestation of 13mu	33.5	According to construction progress, the partial retaining engineering has been built.
	Luzha Kuorong Spoil Ground at Dagouzhuang Inclined Shaft	On right side of DK185+200	$26\times10^4m^3$, 63 mu, recultivation and afforestation	29.5	Retaining wall completed

	Mozha Inclined Shaft	500m on right side of DK185+800	$40\times10^4m^3$, 80mu, recultivation and afforestation	40.1	Retaining wall completed
	Dagouzhuang Inclined Shaft	900m on right side of DK187+600	46×104m3, 75mu, recultivation and afforestation	47.1	Retaining wall completed
	Dazhangou	On right side of DK187+900	$37.6\times10^4m^3$, 80mu, recultivation and afforestation	38.7	Retaining wall completed
	Majiagou	On right side of DK190+000	$25.4\times10^4m^3$, 81mu, recultivation and afforestation	54.5	Retaining wall completed
	Exit of Muzhailing Tunnel	On right side of DK192+390	$41.1\times10^4m^3$, 87mu, recultivation and afforestation	35	Retaining wall completed
	Dengjiamo Inclined Shaft	326m on right side of DK236+010	$84.9\times10^4m^3$, 152mu, recultivation and afforestation	84.9	Retaining wall completed
	Entrance of Majiashan Tunnel	On right side of DK240+800	$30.4\times10^4m^3$, 65mu, recultivation and afforestation	9.1	Retaining walis unnecessary
	Shangluo Inclined Shaft	1000m on right side of DK242+348	$32.3\times10^4m^3$, 89mu, recultivation and afforestation	71	Retaining wall completed
	Exit of Majiashan Tunnel	DK247+030	$34\times10^4m^3$, land covering of 64mu, recultivation and afforestation	25.6	Retaining wall completed
	Entrance of Tongzhai Tunnel	200m on right side of DK247+200	$37.8\times10^4m^3$, 96mu, recultivation and afforestation	35.7	Engineering of retaining is being built.
	Xiaduogou Inclined Shaft of Tongzhai Tunnel	On left side of DK254+200	$42.2\times10^4m^3$,78mu, recultivation and afforestation	54	According to construction progress, the partial retaining engineering has been built.
	Exit of Tongzhai Tunnel	On left side of DK255+580	$39\times10^4m^3$, land covering of 90mu, recultivation and afforestation	28	According to construction progress, the partial retaining engineering has been built.
	Entrance of Qinggang Tunnel	On left side of DK256+200	$2.04\times10^5m^3$, 74mu, recultivation and afforestation	23	Retaining wall completed
	Exit of Qinggang Tunnel	500m on right side of DK259+900	$20.4\times10^5m^3$, 42mu, recultivation and afforestation	18	Engineering of retaining is built.
Investigation Situation	Taiping Spoil Ground with rail and newly added Luzha Spoil Ground. Debris retaining dam and drainage ditch are built at the Taiping Spoil Ground with rail. Vegetation already grows at the newly added Luzha Spoil Ground.				

Table 4-5: Implementation Details of Environmental Protection of Various Bid Sections (LYS-3-2)

Contractor: China Railway 7th Bureau Group Co., Ltd.				Supervisor: Beijing Tiecheng Construction Supervision Co., Ltd.		
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Min County of Gansu Province	Transported out to garbage area	Discharged to sedimentation tank for treatment	163	720	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Guzishan Tunnel	DK193+155-DK195+668	2457	
	Zhifang Tunnel	DK201+817～DK206+952	4873	Discarded to Zhifang Spoil Ground
	Entrance of Hadapu Tunnel	DK220+486～DK233+000	22158	Spoil ground at entrance of tunnel, and Spoil ground of A'wu Inclined Shaft, Hada Inclined Shaft, Xidie Inclined Shaft, and Xigu Inclined Shaft

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Suzigou Super-major Bridge	DK192+401.67～DK2192+957.83	Finished	Transported out to pointed place for treatment
	Yejiapo Super-major Bridge	DK199+0.58～DK200+235.67	Finished	Transported out to pointed place for treatment
	No. 1 Super-major Bridge over Taohe River	DK195+681.58～DK198+614.32	Finished	Transported out to pointed place for treatment
	No. 2 Super-major Bridge over Taohe River	DK201+211.22～DK201+767.03	Finished	Transported out to pointed place for treatment
	No. 1 Super-major Bridge over Diezang River	DK206+950.06-DK208+407.79	Finished	Transported out to pointed place for treatment
	Super-major Bridge over Xihe River	DK209+71.93-DK209+674.49	Finished	Transported out to pointed place for treatment
	No. 2 Super-major Bridge over Diezang River	DK213+508.55-DK213+639.45	Finished	Transported out to pointed place for treatment
	Layingou Major Bridge	DK214+525.54-DK214+769.83	Finished	Transported out to pointed place for treatment
	No. 3 Super-major Bridge over Diezang River	DK219+583.51-DK220+100.51	Finished	Transported out to pointed place for treatment

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Entrance of Guzishan Tunnel	On right side of DK193+120	$17.5\times10^4m^3$, 40mu, 25mu recultivated and 15mu afforested	13	Design 8545 m^3 Build 5700 m^3
	Exit of Guzishan Tunnel	On left side of DK195+800	$8.8\times10^4m^3$, 86mu, 50mu recultivated and 36mu afforested	1.5	It's already been cancelled because the local authority does not agree.
	Exit of Guzishan Tunnel (newly added)	On right side of DK195+800	$25.4\times10^4m^3$, 106 mu	28	Design 15468 m^3 Already built 5156 m^3
	Entrance of Zhifang Tunnel	On right side of DK201+800	$24\times10^4m^3$, 28mu, 15mu recultivated, and 7 mu afforestation	22	The designed concrete retaining wall 6437 m^3 is already completed, ditch at the top slag is not completed yet.
	Exit of Zhifang Tunnel	DK207+600	$60\times10^4m^3$, 180mu, 40mu recultivated and 63mu afforested	15 Slag is used by the local authority	Used for the inclined shaft and exit of Zhifang Tunnel,and Xiaheyang Tunnel. Slag is not discarded yet.
	Xia'ayang Tunnel	600m on left side of DK208+700	$9\times10^4m^3$, 61mu, 42mu recultivated and 19mu afforested	5	Cancelled
	Maposhan Borrow Pit	On right side of DK211+300	37mu and 20mu afforested	5	It becomes permanent land acquisition and is handled to County Forestry Bureau for restoration
	Jiangouyangpo Borrow Pit	On right side of DK212+300	58.29mu and 58.29mu afforested	26.7	In use
	Xiaowanshanzui Borrow Pit	On right side of DK213+500	95.15mu and 50mu afforested	40.2	Under restoration
	Lashegou Borrow Pit	On right side of DK214+640	33.74mu and 33.74mu afforested	11.9	Under restoration
	Lashegou Borrow Pit	On right side of DK215+750	92.99mu and 92.99mu afforested	45.5	Under restoration
	Dongpoyangpo Borrow Pit	On right side of DK219+600	28mu and 28mu afforested	13.5	Under restoration
	Entrance of Hadapu Tunnel	DK220+486	$70\times10^4m^3$, 77mu, 27mu recultivated, and 50mu afforestated	44.6	Masonry completed

	A'wu Inclined Shaft of Hadapu Tunnel	DK227+153.4	41.4×10^{4}m^3, 88mu, 70mu recultivated and 18mu afforested	41.4	Design mansonry completed Left 10×10^{4}m^3 of discarded slag is transferred to Hada inclined shaft of spoil ground
	Hada Inclined Shaft of Hadapu Tunnel	DK228+530.1	30.7×10^{4}m^3, 105mu, 11mu recultivated, and 94 mu afforestation	29.2	Design 22969 m^3 Masonry completed
	Xidie Inclined Shaft of Hadapu Tunnel	DK229+900	35.4×10^{4}m^3, 81mu, 10mu recultivated, and 23 mu afforestation	35.4	Design 17797 m^3 Masonry completed
	Xigu Inclined Shaft of Hadapu Tunnel	DK231+509.11	33.2×10^{4}m^3, 69mu, 48mu recultivated and 21mu afforested	32.5	Completion of building

Cultural Relic	Name	Mileages	Design Measures	Implementation Details
	Shannashuzha Site in Min County	DK198+614, 32~ DK199+0, 58	The alteration of road to bridge is passed	Bridge completed

Investigation Situation	Taohe River 1# Super Major Bridge, spoil ground at exit of Zhifang Tunnel, and Taohe 2# Super Major Bridge. Taohe River 1# Super Major Bridge is completed and underbridge is restored. Drainage ditch is built at the spoil ground at exit of Zhifang Tunneland and earth covering is being implemented. Taohe 2# Super Major Bridge is completed and underbridge is restored.

Table 4-6: Implementation Details of Environmental Protection of Various Bid Sections (LYS4-1)

Contractor: China Railway 11th Bureau Group Co., Ltd.			Supervisor: Beijing Tieyan Construction Supervision Co., Ltd.			
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Dangchang County, Gansu Province	Collected in classification and buried collectively	Set up sewage sedimentation tank and periodically clean it.	10	120	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Luosha Tunnel	DK259+846-DK267+843	7997	Spoil ground in Jiangtai Township
	Xinchengzi Tunnel	DK268+010-DK277+168	8939	Spoil ground of Jianzi River
	Maoyushan Tunnel	DK277+312-DK285+816	8434	Linjiangpu Spoil Ground

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Bashangou Major Bridge	DK259+522-DK259+674	152	Set up slurry pond and clean it periodically.
	Major Bridge over Jianzi River	DK267+843-DK268+010	167	Set up slurry pond and clean it periodically.
	Linjiangpu Major Bridge	DK277+174—DK277+312	276	Set up slurry pond and clean it periodically.

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
	Entrance of Luosha Tunnel	3000m to the left of DK259+592	$41.1\times10^4m^3$, land covering of 102mu and 102mu recultivated	41.4	Retaining wall built
	Mantougou Spoil Ground	3000m to the left of DK268+015	103.5×10^4m3, land covering of 202mu and 202mu recultivated	103.5	Retaining wall built
	Laoshuchuan Spoil Ground	4000m on right side of DK271+500	$37\times10^4m^3$, land covering of 85mu and 85mu recultivated	37	Retaining wall built
	Sitougou Spoil Ground	3000m on right side of DK274+100	$63\times10^4m^3$, land covering of 85mu and 85mu recultivated	60	Retaining wall built
	Linjiangpu Spoil Ground	2000m on right side of DK277+312	$87\times10^4m^3$, land covering of 150mu and 150mu recultivated	79	Retaining wall built
	Caijiangtou Spoil Ground	3000m on right side of DK277+312	$15\times10^4m^3$, land covering of 52mu and 50mu recultivated	15	Retaining wall built
	Luotuoxia Spoil Ground	1800m on right side of DK281+200	$66\times10^4m^3$, land covering of 85mu and 85mu recultivated	61	Retaining wall completed

	Ganjiangtou Spoil Ground	1600m on right side of DK285+816	$67.5\times10^4m^3$, land covering of 101mu and 101mu recultivated	67.5	Retaining wall completed
Investigation Situation	Taishuigou Spoil Ground at Xinchengzi Tunnel, Taishuigou construction campsite at Xinchengzi Tunnel, and Luotuoxia Spoil Ground. Taishuigou Spoil Ground at Xinchengzi Tunnel is completed, retaining wall is built along the river, interception ditch is built at the foot of the mountain, and earth covering is being restored. Taishuigou construction campsite at Xinchengzi Tunnel is already tore down and has restored the original landform. Luotuoxia Spoil Ground In April, 2015, the design institute, Longnan Zhi, China Railway 11th Bureau, Water Supplies Bureau of Dangchang County, and Linjiangpu Township Government convenes the workshops and passes the plan of volume expansion of spoil ground. Move outside the original retaining wall, make sure the watercourse width no less than 100meters. Now new construction retaining wall is in preparation.				

Table 4-7: Implementation Details of Environmental Protection of Various Bid Sections (LYS-4-2)

Contractor: China Railway 13th Bureau Group Co., Ltd.				Supervisor: Beijing Tieyan Construction Supervision Co., Ltd.		
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Miaoxia Village in Lianghekou of Subdivision 1	Garbage is collected in classification and stored together, and then handed over to environmental sanitation department.	With Sedimentation and Septic Tanks	12	460	Self-built
	Sixia Village in Shawan Town of Subdivision 2	Garbage is collected in classification and stored together, and then handed over to environmental sanitation department.	With Sedimentation and Septic Tanks	6	326	Self-built
	Sishang Village in Shawan Town of Subdivision 3	Garbage is collected in classification and stored together, and then handed over to environmental sanitation department.	With Sedimentation and Septic Tanks	1	18	Self-built
	Yayuan Village in Shawan Town of Subdivision 4	Garbage is collected in classification and stored together, and then handed over to environmental sanitation department.	With Sedimentation and Septic Tanks	1	182	Self-built
	Shangbaiyangshuba Village in Shimen Township of Subdivision 5	Garbage is collected in classification and stored together, and then handed over to environmental sanitation department.	With Sedimentation and Septic Tanks	7	77	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site

	Tianchiping Tunnel	DK285+975～DK300+503	14528 (Cut through)	Discard soil at spoil ground of DK285+975, DK290+700, DK293+175, DK297+400 DK300+503, DK301+282
	Huama Tunnel	DK301+282～DK313+858	12580 (Cut through)	Discard soil at spoil ground of DK301+282, DK305+700, DK309+700, DK314+185
	Shanghou Tunnel	DK314+490～DK316+915	2413 (Cut through)	Discard soil at spoil ground of DK317+000.
	Luba Tunnel	DK323+846～DK327+825	3971 (Cut through)	Discard soil at spoil ground of DK325+050, DK328+089
	Baicaoba Tunnel	DK331+594～DK332+658	1087 (Cut through)	Discard soil at spoil ground of DK331+583
	Xiaoshanping Tunnel	DK339+670～DK341+834	2160 (Cut through)	Discard soil at spoil ground of DK339+000, DK341+800

	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
Super-major Bridge, Major Bridge	No. 1 Super-major Bridge over Bailong River	DK313+845.09~DK314+481.95	636.86	Discard soil at spoil ground of DK314+185.
	Dazhai Major Bridge	DK316+922.25~ DK317+203.8	281.56	Discard soil at spoil ground of DK317+000.
	Yayuan Super-major Bridge	DK317+858.3~ DK320+191.13	2333	Discard soil at spoil ground of DK323+350.
	Shaba Super-major Bridge	DK320+940.77~ DK323+366.48	2426	Discard soil at spoil ground of DK323+350.
	Bailong River Major Bridge	DK327+821.87~ DK328+232.38	410.51	Discard soil at spoil ground of DK328+225.
	No. 2 Major Bridge over Bailong River	DK332+818.15~ DK333+233.16	406.38	Spoil ground of DK331+583.
	Chenjiaba Super-major Bridge	DK334+032.07~ DK334+671.18	641.44	Discard soil at spoil ground of DK334+700.
	Qingjiaba Super-major Bridge	DK336+258.64~ DK337+856.42	1608.21	Discard soil at spoil ground of DK337+800.
	No. 1 Super-major Bridge of Xiaoshanping	DK338+318.42~ DK338+921.74	603.32	Discard soil at spoil ground of DK339+000.
	No. 2 Super-major Bridge of Xiaoshanping	DK339+071.05~ DK339+672.32	601.27	Discard soil at spoil ground of DK339+000.
	No. 3 Super-major Bridge over Bailong River	DK341+842.07~ DK352+745.54	10903	Discard soil at spoil ground of DK339+000, DK341+800

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites

	Entrance of Tianchiping Tunnel	DK285+975	$41.4\times10^4m^3$, 88 mu, recultivation and afforestation	40.8	Retaining wall Completed
	Dengqiaogou Inclined Shaft	DK290+700	$38.5\times10^4m^3$, 85 mu, recultivation and afforestation	38	Retaining wall Completed
	Tianchiligou Inclined Shaft	DK293+175	$44.5\times10^4m^3$, 120 mu, recultivation and afforestation	44.5	Retaining wall Completed
	Guangpinggou Inclined Shaft	DK297+400	$45.9\times10^4m^3$, 120 mu, recultivation and afforestation	45.9	Retaining wall Completed
	Exit of Tianchiping	DK300+503	$33.8\times10^4m^3$, 150 mu, recultivation and afforestation	33.8	Retaining wall Completed
	Entrance of Huama Tunnel	DK301+282	$43.7\times10^4m^3$, 87.1 mu, recultivation and afforestation	43.6	Retaining wall Completed
	Huamagou Inclined Shaft	DK305+700	$51\times10^4m^3$, 46.8 mu, recultivation and afforestation	51	Retaining wall Completed
	Shijiayuan Inclined Shaft	DK309+700	$49\times10^4m^3$, 69.8 mu, recultivation and afforestation	27.2	Retaining wall Completed
	Exit of Huama Tunnel	DK314+185	$26\times10^4m^3$, 60 mu, recultivation and afforestation	26	Unfinished retaining wall
	Shanghou Tunnel	DK317+000	3.51×10^5m3, 74mu, 63mu recultivated, and afforestation	35.1	Retaining wall Completed
	Dazhai Tunnel	DK317+000	4.3×10^4m3, 20.6mu, and whole afforestation	4.3	Retaining wall Completed
	Xinzhai Tunnel	Xinzhai Village 550m on left side of DK320+200	$10.1\times10^4m^3$, 29.8mu, and recultivation and afforestation	10.1	Retaining wall Completed
	Shaba Tunnel	DK323+350	$4.1\times10^4m^3$, 14 mu, recultivation and afforestation	4.6	Retaining wall Completed
	Entrance of Luba Tunnel	DK323+719	$27.9\times10^4m^3$, 41 mu, recultivation and afforestation	27.9	Retaining wall Completed
	Exit of Luba Tunnel	Gongjiao township 100m on right side of DK328+225	$29.2\times10^4m^3$, 70 mu, recultivation and afforestation	28.16	Retaining wall Completed
	Entrance of Baicaoba Tunnel	DK331+583	$17\times10^4m^3$, 35 mu, recultivation and afforestation	17	Retaining wall Completed
	Entrance of Gangudun Tunnel	DK334+800	13.7×10^4m3, 31.2mu, and recultivation and afforestation	7.7	Retaining wall Completed

	Exit of Gangudun Tunnel	DK336+400	$6.2\times10^4m^3$, 8 mu, undisturbed soil Reclamation, greening	6.2	Retaining wall Completed Site recovery will be done after the main construction is completed
	Exit of Qingjiaba Tunnel	DK337+800	$7.2\times10^4m^3$, 22.9 mu, recultivation and afforestation	7.2	Retaining wall Completed
	Entrance of Xiaoshanping Tunnel	DK339+000	$15\times10^4m^3$, 64 mu, recultivation and afforestation	15	Retaining wall Completed
	Exit of Xiaoshanping Tunnel	DK341+800	$15\times10^4m^3$, 21 mu, recultivation and afforestation	15	Retaining wall Completed
	Spoil ground in No. 3 Super-major Bridge over Bailong River	Slope on right side of DK342+930	$18.5\times10^4m^3$, 33.69 mu, recultivation and afforestation	17.0	Retaining wall Completed
Investigation Situation	2# spoil ground at exit of Tainchiping Tunnel, 1# spoil ground at exit of Tainchiping Tunnel, spoil ground at exit of Huama Tunnel, Yayuan Super Major Bridge, Chenjiaba Super Major Bridge, and Bailong River 3# Super Major Bridge. 2# spoil ground at exit of Tainchiping Tunnel is finished with cleaning up and earth covering. 1# spoil ground at exit of Tainchiping Tunnel is finished with cleaning up and earth covering. spoil ground at exit of Huama Tunnel is used by the local authority and built into Sixia Village Cultural Square Yayuan Super Major Bridge is completed. Chenjiaba Super Major Bridge is completed. Bailong River 3# Super Major Bridge is completed.				

Table 4-8: Implementation Details of Environmental Protection of Various Bid Sections (LYS-5)

Contractor: Project management department of Lanzhou-Chongqing Railway of CCCC Second Highway Company, Ltd.	Supervisor: Supervision station of Lanzhou-Chongqing Railway of Lanzhou Jiaotong University

Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Jishiba Village in Liangshui Town	Collectively transported outside	Discharge it after sedimenting by sedimentation tank.	8	40	Rent
	Huiyazi of Zhongloutan	Collectively transported outside	Discharge it after sedimenting by sedimentation tank.	4	60	Self-built
	Exit of Liangshui Tunnel	Collectively transported outside	Discharge it after sedimenting by sedimentation tank.	3	120	Self-built
	Entrance of Qingshui Tunnel	Collectively transported outside	Discharge it after sedimenting by sedimentation tank.	3	118	Self-built
	Hanwang Town	Garbage unitary treatment	Discharged to the underground sewage conduit after sedimenting of sedimentation tank	3	65	Rent
	Entrance of Jvgan Tunnel	Collectively transported outside	Discharge it after sedimenting by sedimentation tank.	3	0	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Liangshui Tunnel	DK357+082--DK362+090	4828.35 (through)	100m on right side of DK358+200
	Qingshui Tunnel	DK366+092～DK362+443.5	3648.5 (through)	Development zone of Dongjiang Town in Wudu District
	Yangjiaba Liangshui Tunnel	DK374+592～DK376+722	2180 (through)	Development zone of Dongjiang Town in Wudu District
	Jvgan Tunnel	DK380+738～DK388+900	8162 (through)	300m on left side of DK386+000 and 100m on left side of DK388+900

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Bailong River No. 4 Super-major Bridge	DK356+324--DK357+082	758 (Finished)	Discharge the slurry after sedimentation and transport outside the discarded soil. Transport it after covering.
	Super-major Bridge over Beiyuhe River	DK362+106-DK362+747	0	

	Wangjiagou Super-major Bridge	DK374+591～DK373+701, 17	890 (Finished)	Land-filling or outward transport
	Super-major Bridge over Bailong River in Hanwang	DK379+0, 53～DK380+733, 62	1733.09 (Finished)	Construction Preparation Office in Wudu Jail
	Jugan Station Major Bridge	DK389+905～DK389+566	339 (Finished)	Discharge the slurry after sedimentation and transport outside the discarded soil. Transport it after covering.
	Jugan Station Major Bridge	DK389+903～DK390+223	320 (Finished)	Discharge the slurry after sedimentation and transport outside the discarded soil. Transport it after covering.
	Super-major Bridge over Bailong River in Jvgan	DK390+880--DK391+805	925 (Finished)	Discharge the slurry after sedimentation and transport outside the discarded soil. Transport it after covering.

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Spoil ground at entrance of Liangshui Tunnel	On Left side of DK353+600	$29.6\times10^4m^3$, 61.3 mu, afforestation	29	Retaining wall Completed
	Spoil ground at exit of Liangshui Tunnel	On left side of DK354+600	$10.4\times10^4m^3$, 38.6 mu, afforestation	9.3	Retaining wall Completed
	Spoil ground at entrance of Qingshui Tunnel	DK358+200	$60.27\times10^4m^3$, 100 mu, recovery of original landform and afforestation	60.27	Retaining wall Completed
	Spoil ground at exit of Qiangshui Tunnel	DK372+040	$24.4\times10^4m^3$, 30 mu, recovery of original landform and afforestation	24	Building foundation for filling
	Yangjiaba Liangshui Tunnel Spoil ground of Cangyuan Tunnel	DK379+163	$40.7\times10^4m^3$, 145.3 mu, recovery of original landform and afforestation	41	Building of retaining wall
	Spoil ground at entrance of Jvgan Tunnel	DK380+600	$34.9\times10^4m^3$, 94 mu, recultivation and afforestation	34.9	Building of retaining wall for 506m
	Spoil ground of transverse gallery of Jvgan Tunnel	300m on left side of DK386+000	$34.2\times10^4m^3$, 68mu, recultivation and afforestation	34.2	Retaining wall Completed
	Spoil ground at exit of Jvgan Tunnel	100m on left side of DK388+900	$40.2\times10^4m^3$, 60mu, recultivation and afforestation	40.2	Retaining wall Completed

	Spoil ground of Zhaojiaba Tunnel	150m on left side of DK390+100	$9.2\times10^4m^3$, 8mu, recultivation and afforestation	9.2	Retaining wall Completed
Investigation Situation	Longnan Station and Hengdong Spoil Ground at Jugan Tunnel. Main construction of station building of Longnan Station is going smoothly. Retaining wall is built along the Minjiang River for the Hengdong Spoil Ground at Jugan Tunnel, and earth covering is done for the spoil ground surface and cultivation is restored.				

Table 4-9: Implementation Details of Environmental Protection of Various Bid Sections (XQLS-1)

Contractor: Engineering headquarters of Lanzhou-Chongqing Railway of China Railway 18th Bureau Group Co., Ltd.	Supervisor: Supervision station of Lanzhou-Chongqing Railway of Sichuan Tieke Construction Supervision Co., Ltd.

Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Construction area at entrance: Toufang Village of Wainan Township in Wudu District	Set garbage pond and bury it.	Grade 3 Sedimentation	13	35	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Right line of West Qinling Tunnel	DIyK395+116.582～DIyK423+351.422	268807	Spoil ground of Panjiagou, Dianziping, Liyuangou and Tangjiagou
	Fanjiaping Tunnel	DIK391+815～DIK395+013	3201.8	Spoil ground of Fujingou and Panjiagou

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
	Fujingou	DIK391+500	$44.5\times10^4m^3$, 41 mu	35	Retaining wall completed
	Panjiagou	DIK395+000	$75.4\times10^5m^3$, 88mu, and backfilling	74	Retaining wall completed
	Dianziping	DIK397+000	$70.4\times10^4m^3$, 80 mu	69	Retaining wall completed
	Zhangheba	DIK397+000	$57\times10^4m^3$, 51 mu	53	Retaining wall completed
	Dayuanba	DIK391+500	$20\times10^4m^3$, 20.8 mu	18	Retaining wall completed
Investigation Situation	Dyuanba Spoil Ground Completed, retaining wall is built and the ground is flattened.				

Table 4-10: Implementation Details of Environmental Protection of Various Bid Sections (XQLS-2)

Contractor: China Railway Tunnel Stock Co., Ltd.				Supervisor: Sichuan Railway Sciences Construction Co., Ltd.		
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Exit TBM work area at the Naoyuan Village, Luotang Town, Longnan City	Set up the garbage pond and periodically and collectively bury in depth.	Set the sedimentation tank and septic tank and discharge it after sedimenting.	4	162	Self-built
	TBM work area at exit: Sikewan Village in Luotang Town of Wudu District	Set up the garbage pond and periodically and collectively bury in depth.	Set the sedimentation tank and septic tank and discharge it after sedimenting.	6	21	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Left line of West Qinling Tunnel	DIK395+116～DIK423+352	28750	Discarded to pointed spoil ground

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	No. 1 major bridge of left line over Luotanghe River	DIK423+369.19～ DIK423+503.19	134	Used for filling the construction site
	No. 2 major bridge of left line over Luotanghe River	DIK423+527.15～ DIK423+704.95	417.8	Used for filling the construction site
	Super-major bridge of right line over Luotanghe River	DIyK423+370.98～ DIyK423+944.95	573.97	Used for filling the construction site

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
	Luojiali Spoil Ground (Yousancai Spoil Ground, Luojiali Spoil Ground, Shuyuan Spoil Ground, Tangjiaba Spoil Ground, Luchuping Spoil Ground) (already altered)	on left of DIK413+388 Chongqing direction	Designed waste slag $306\times10^4m^3$, 580mu of land covering, recultivation of 380mu and afforestation of 200mu on sloping surface	269	Retaining wall of spoil ground has been removed;Shuyuan spoil ground has been leveled;and XiaoLuojia spoil ground is leveling
	Exit of tunnel: Liyuangou Spoil Ground	On the right of DIK424+2002, 5Km	$1.2\times10^6m^3$, 195mu, recultivation of 95mu and afforestation	174	Retaining wall completed

	Wangjiagou Spoil Ground (newly added)	3km on right of DIK424+300 Chongqing direction	$80\times10^4m^3$, 121mu, afforestation of 40mu on sloping surface	77.4	Retaining wall completed
Investigation Situation	Liyuangou Spoil Ground. Completed, retaining wall is built, ground is not flattened.				

Table 4-11: Implementation Details of Environmental Protection of Various Bid Sections (LYS-6)

Contractor: Project management department of Lanzhou-Chongqing Railway of China First Harbor Engineering Company Ltd.	Supervisor: Supervision station of Lanzhou-Chongqing Railway of Inner Mongolia Qinyuan Engineering Construction and Supervision Co., Ltd.

Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Yudu Park on Dong'an Road in Guangyuan City (project department)	Collectively treated by property company	Collectively treated by property company	3	27	Rent
	Fengxiang Township in Wudu District of Longnan City	Landfilling	Discharge it after sedimenting of sedimentation tank.	3	42	Self-built
	Pingyuan Village in Yaodu Town (Subdivision 2)	Collectively recycled and handed to local environmental and health department	Set the sedimentation tank.	1	65	Self-built
	Yangmu Town in Chaotian District of Guangyuan City	Collectively treated by local environmental protection department	Collectively treated by local environmental protection department	6	85	Self-built

	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
Tunnel longer than 1000 m	Yangjiashan Tunnel	DK423+938～DK429+768	5664	Yatali, Shanggouli and Chenjiagou
	Guanziling Tunnel	DK431+057～DK433+782	2725	Weihegou
	Fengxiangyuan Tunnel	DK433+982～DK446+181	12012	Weihegou and Caojiahe
	Zizhuyuan Tunnel	DK446+257～DK452+838	6581	Caojiahe
	Liujiahe Tunnel	DK453+250～DK456+445	3195	Roadbed of Yaodu Station
	Longchishan Tunnel	DK457+923～DK469+236	11259	Each spoil ground of Longchishan Tunnel
	Wangjiahe Tunnel	DK470+918～DK478+670	7752	Wangjiahe, Guojiagou and Xiahebagou
	Huashi Tunnel	DK478+765～DK486+184	7419	Xiahebagou and riverway of Toucanhe
	Nanyashan Tunnel	DK486+519～DK491+755	5236	Each spoil ground of tunnel
	Quanzi'e Tunnel	DK493+792～DK499+830	6038	Each spoil ground of tunnel

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Super-major Bridge of Luotanghe River Station	DK430+31.65～DK431+50.35	921	Discarded to the spoil ground of Weihegou

	Weihegou Major Bridge	DK433+789.3～DK433+980.7	165	Discarded to the spoil ground of Weihegou
	Major Bridge over Liujiahe River	DK452+860～DK453+153.5	314.8	Discarded to the spoil ground at exit of Zizhuyuan Tunnel
	Major Bridge over Handaohe River	DK457+502.05～DK457+678.7	164.25	Discarded to the spoil ground at entrance of Longchishan Tunnel
	Super-major Bridge over Jinxihe River	DK469+272.45～DK469+815.55	492.5	Left bank of Jinxihe River; in spoil ground and slurry transported to designated sit by special vehicle
	Major Bridge over Wangjiahe River	DK470+23.85～DK470+264.07	206.9	Slurry transported to designated sit by special vehicle
	Dagouli Major Bridge	DK470+721.52～DK470+891.35	125	Slurry transported to designated sit by special vehicle
	Major Bridge over Toucanhe River	DK486+273.2～DK486+509.05	210.8	The discarded soil and slurry are transported to the spoil ground at exit of Huashi Tunnel by special vehicle.
	Major Bridge over Yangmuhe River	DK492+541.55~DK492+893.45	320.8	The discarded soil and slurry are transported to the spoil ground at exit of Nanyashan Tunnel by special vehicle.
	Hougou major Bridge	DK493+630.72～DK493+774.19	122.9	The discarded soil and slurry are transported to the spoil ground at entrance of Quanziya Tunnel by special vehicle.
	Xiaganzigou Major Bridge	DK499+866.65～DK500+074.32	193.1	The discarded soil and slurry are transported to the spoil ground at exit of Quanziya Tunnel by special vehicle.

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Entrance of Yangjiashan Tunnel (Lijiagou)	DK423+938	$3.83\times10^5m^3$, 65mu, afforestation	38.3	Finished
	Exit of Yangjiashan Tunnel (Chenjiagou)	DK429+768	$3.83\times10^5m^3$, 80mu, afforestation	37	Finished
	Guanziling Tunnel (Weihegou)	DK432+700	$40.4\times10^4m^3$, 67mu, afforestation	40.4	Finished
	Fengxiangyuan Tunnel (Weihegou)	DK433+982	$74.7\times10^4m^3$, 121mu, afforestation	84.2	Finished
	Fengxiangyuan Tunnel (Caojiahe)	DK443+000	$3.69\times10^5m^3$, 98mu, afforestation	36.9	Finished
	Spoil ground of Caojiahe	DK446+181	$7.8\times10^5m^3$, 164mu, afforestation	80.8	Finished

	Spoil ground at exit of Liujiahe Tunnel	Left of DK456+560	$10.5\times10^4m^3$, 23.5 mu, afforestation	14.3	Finished
	Spoil ground at entrance of Longchishan Tunnel	DK458+500 Left	$16.1\times10^4m^3$, 43.7 mu, afforestation	15.5	Finished
	No. 1 spoil ground of Tian'erwan Inclined Shaft	In desolate gully on right of inclined shaft	$17.65\times10^4m^3$, 45.74 mu, afforestation	16	Finished
	No. 2 spoil ground of Tian'erwan Inclined Shaft	In desolate gully on right of inclined shaft	$39\times10^4m^3$, 70 mu, afforestation	37.5	Finished
	Spoil ground at exit of Longchishan	In desolate gully on right of exit	$4.22\times10^5m^3$, 46.6mu, afforestation	31.8	Finished
	No. 1 spoil ground of Baijialiang Transverse Gallery	In desolate gully on right of exit of transverse gallery	$4.38\times10^5m^3$, 66mu, afforestation	11.9	Finished
	No. 2 spoil ground of Baijialiang Transverse Gallery	In desolate gully on right of exit of transverse gallery	$2.86\times10^5m^3$, 32mu, afforestation	20.1	Finished
	Spoil ground at exit of Zizhuyuan	In desolate gully on right of the tunnel exit	$54\times10^4m^3$, barrage	54	Finished
	No. 1 spoil ground at entrance of Wangjiahe	Two pieces of dry land locating at 200m and 400m on right side of DK470+400	$38\times10^4m^3$, 52mu, and vegetation recovery	38	Finished
	No. 2 spoil ground at entrance of Wangjiahe	Tunnel Portal	$13\times10^4m^3$, 21mu, and vegetation recovery	19.6	Finished
	Inclined shaft's spoil ground of Guojiagou in Wangjiahe	Outside the hole and in Guojiahe	$45\times10^4m^3$, 58mu, and drainage ditch	39	Finished
	Exit of Wangjiahe and entrance of Huashi	Xiaheba gully	$65\times10^4m^3$, 142mu, and drainage ditch	57	Finished
	New spoil ground of Zhangjiahe Inclined Shaft in Huashi Tunnel	300m on right side of DK483+500	$20\times10^4m^3$, 85.8 mu, vegetation recovery	20	Finished
	Spoil ground of Zhangjiahe Inclined Shaft in Huashi Tunnel	500m on right side of DK485+500	$20\times10^4m^3$, 58 mu, vegetation recovery	7	Finished

	No. 1 spoil ground at exit of Huashi Tunnel	DK486+000	$2.3\times10^5m^3$, 79mu	23	Finished
	New spoil ground at exit of Huashi Tunnel	Touchanhe River valley locating at 1.5km on left side of DK486+001	$0.7\times10^5m^3$, 21mu	7	Finished
	New spoil ground at entrance of Nanyashan Tunnel	Col gully locating at 275m on right side of DK486+010	$12\times10^4m^3$, 37mu, afforestation	11	Finished
	No. 1 spoil ground at entrance of Nanyashan Tunnel	Wangjiagou locating at 200m on right side of DK486+500	$1.07\times10^5m^3$, 31mu, afforestation	10.7	Finished
	No. 2 spoil ground at entrance of Nanyashan Tunnel	Huangnipinggou locating at 300m on left side of DK486+800	$13.2\times10^4m^3$, 17mu, afforestation	14.8	Finished
	Spoil ground at exit of Nanyashan Tunnel	50m on west side of DK491+740	$37\times10^4m^3$, 13mu, vegetation recovery	20	Finished
	No. 1 spoil ground at entrance of Quanziya Tunnel	On right side of DK494+200	$14.4\times10^4m^3$, 29 mu	28.2	Finished
	No. 2 spoil ground at entrance of Quanziya Tunnel	Left side at entrance of tunnel	$14.4\times10^4m^3$, 24 mu	14	Finished
	Spoil ground at exit of Quanziya Tunnel	Gully on left side of DK499+830	$48.6.4\times10^4m^3$, 45 mu	45	Finished
Investigation Situation	Yangjia Spoil ground at exit of Yangjiashan Tunnel, Guanziling Tunnel spoil ground, Changyaodu Station, and subgrade of Yaodu Station. Spillway is built for the spoil ground diversion tunnel is excavated at entrance of Yangjia Tunnel. Drainage ditch field is flattened at Guanziling Tunnel spoil ground. Main construction of platform canopies of Yaodu Station is constructed. Slope greening grid of the subgrade of Yaodu Station is completed.				

Table 4-12: Implementation Details of Environmental Protection of Various Bid Sections (LYS-7)

Contractor: Project management of Lanzhou-Chongqing Railway of China Railway 21st Bureau Group Co., Ltd.			Supervisor: Gansu Xinda Construction Supervision Co., Ltd.			
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Project management department		Drainage pipe	2	22	Rent
	Taoshuping and Baijiapo Tunnel	Periodically and collectively treated	Periodically and collectively treated	4	1088	Self-built
	Division I: Fangjiaquan Village	Periodically and collectively treated	Sedimentation tank	4	12	Self-built
	Division IV: beam field	Periodically and collectively treated	Septic Tank	6	33	Self-built
	Taoshuping Mixing Station	Periodically and collectively treated	Sedimentation tank	Available	21	Self-built
	Mixing station of Subdivision 3	Bury	Sedimentation tank	9	15	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Taoshuping Tunnel	DK3+430-DK6+655	2910	Each spoil ground at entrance, exit and inclined shaft
	Baijiapo Tunnel	DK7+284-DK10+382	3098 Finished	Each spoil ground at entrance, exit and inclined shaft

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Fangjiaquan Major Bridge	DK7+56.4-DK7+241.97	185.57 Finished	Discharge the slurry after sedimenting and discarded soil is transported to spoil ground.
	Xigou Bridge	DK10+382.38-DK10+552.32	169.94 Finished	Discharge the slurry after sedimenting and discarded soil is transported to spoil ground.
	Donggou Major Bridge	DK11+200.35-DK11+312.15	101.2	Discharge the slurry after sedimenting and discarded soil is transported to spoil ground.
	Fengjiawan Super-major Bridge	DK11+956.82-DK12+691.80	734.98 Finished	Discharge the slurry after sedimenting and discarded soil is transported to spoil ground.
	Jinjiaping No.1 Major Bridge	DK13+136.27-DK13+301.23	164.96 Finished	No mud and spoil

	Jinjiaping No.2 Major Bridge	DK13+845.10-DK14+248.82	403.22 Finished	No mud and spoil
	Shijiaping Super-major Bridge	DK14+883.03- DK15+860.97	977.94 Finished	Slurry is for united discharging and discarded soil is transported to spoil ground for treatment
	Zhangjiawan Major Bridge	DK17+061.99-DK17+520.88	458.89 Finished	No mud and spoil
	Longergou Major Bridge	DK18+411.13-DK18+582.27	171.14 Finished	No mud and spoil
	Lujiaya Super-major Bridge	DK19+460.81- DK20+261.73	800.92 Finished	Slurry is for united discharging and discarded soil is transported to spoil ground for treatment
	Liangjiaxinzhuang Major Bridge	DK22+216.25-DK22+371.68	155.43 Finished	No mud and spoil
	Yaergou Major Bridge	DK23+366.75-DK23+839.50	472.75 Finished	No mud and spoil
	Gaojiaya Major Bridge	DK25+180.15-DK25+915.50	435.38 Finished	No mud and spoil
	Super-major Bridge Group over Wanchuanhe River in Wangjiaya	DK26+113.82~DK28+548.88	2435.06 Finished	Bury it after sedimenting and discarded soil is used for creating land.
	Longkeshang gaojiaya Super-major Bridge over Wanchuan River	KSDK26+113.82~KSDK28+260.49	2146.67 Finished	No mud and spoil
	Longkexia gaojiaya Major Bridge over Wanchuanhe River	KSDK25+180.24~KSDK25+628.77	448.57 Finished	No mud and spoil
	Lanhuoshangshangwangjiaya Super-major Bridge over Wanchuan River	HSDK26+390.24~HSDK27+790.48	1440.24 Finished	No mud and spoil
	Lanhuoxiawangjiaya Super-major Bridge over Wanchuan River	HXDK26+018.4~HXDK27+790.48	1772.08 Finished	No mud and spoil

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Entrance, No. 0, 1, 2 and Taoshuping Tunnel	Gully on right side of DK4+500	$60.5\times10^4m^3$, 52 mu	32	Partial retaining wall is built.
	Taoshuping No. 4 Inclinedd Shaft, exit of Taoshuping, entrance of Baijiapo and Baijiapo No. 1 Inclined Shaft	Gully on right side of DK7+100	$35.5\times10^5m^3$, 64 mu, and afforestation	30.5	Not built

	No. 2 and 3 Inclined Shaft of Baijiapo Tunnel	Dry land on right side of DK8+800	$24.5\times10^4m^3$, 38.4 mu	20.5	Not built
	No. 4 inclined shaft and exit of Baijiapo Tunnel and entrance of Laizibao Tunnel	Gully on left side of DK10+100	$24\times10^5m^3$, 53 mu, and afforestation	23.89	No blocking and protecting
	Spoil ground of Fengjiawan	on left side of DK11+580 500	$45\times10^4m^3$, 144 mu	43	Gully filled
	Jinjiaping	On left side of DK12+800 500m	$38\times10^5m^3$, 83.2 mu, flattening recovery	26	No blocking and protecting
	Yaergou Borrow Pit	DK23+400	$22\times10^4m^3$, 114mu, flattening recovery	20	flattening completed
	Guodianzi Village	DK25+300	$40.9\times10^4m^3$, 99.4 mu	40	No blocking and protecting
	Gaojiaya	300m on right side of DK25+800	$45.5\times10^4m^3$, 113.8 mu	40	No blocking and protecting

Noise-sensitive Point	Name	Mileages	Design Measures	Implementation Details
	Mechanical noise Processing factory at exit of Taoshuping Tunnel	DK6+655	Reduce nightwork	Well
	Mixing plant		Set far away from villages, crowds, and residence.	Implemented well
	Xiaguanying beam field	DK29+80-DK30+300	Beam fabrication and storage yard is set at the rural open space, sound barrier is only installed at the construction living quarters.	Well

Cultural Relic	Description	Mileages	Design Measures	Implementation Details
	Relics of ancient Xiaguanying	DK27+500	Archaeology shall be done first, then it shall be inspected and approved by Provincial Cultural Relics Bureau before construction	Well
Investigation Situation	Taoshuping Tunnel 2# spoil ground is completed, the ground is hardened, and the local authority has delovloped it into commercial buildings.			

Table 4-13: Implementation Details of Environmental Protection of Various Bid Sections (LYS-8)

Contractor: China Coal NO. 3 Construction (group) Corporation LTD.			Supervisor: Zhengzhou Zhongyuan Construction Supervision Co., Ltd.			
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Haokou Village at exit of Xiongdongwan Tunnel	Collected and buried	Discharge it after grade 3 sedimentation.	8	70	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Xiongdongwan Tunnel	DK569+523～DK576+515	6992	To spoil grounds at entrance and exit

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Ganxigou Major Bridge	DK569+399.45～ DK569+515.25	115.8	Discarded at entrance of spoil ground
	Haokou major brdge	DK577+149.05～ DK577+300	151.95	Discarded at entrance of spoil ground

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
	No. 1 spoil ground at entrance	200m on left side of DK570+000	$11.5\times10^4m^3$, 24.6mu, afforestation	11.5	Built
	No. 2 spoil ground at entrance	150m on left side of DK570+000	$60\times10^4m^3$, 70.5mu, afforestation	60	Built
	Spoil ground at exit	200m on right side of DK577+000	$80\times10^4m^3$, 139 mu, and recultivation	80	Retaining wall is builr and drainage culvert is inbuilt
	Spoil ground of roadbed	103m on right side of DK576+250	$10\times10^4m^3$, 32.4 mu; Reclaimation	10	Retaining wall completed
		宝成客车线左侧 K342+550 左侧	$30\times10^4m^3$, 69.4 mu	20	

Investigation Situation	Spoil ground at exit of Xiondongwan Tunnel, 2# spoil ground at entrance of Xiondongwan Tunnel, and 1# spoil ground at entrance of Xiondongwan Tunnel. Spoil ground at exit of Xiondongwan Tunnel is used by the local authority and is built into logistics field. The retaining wall and drainage ditch are built for 2# spoil ground at entrance of Xiondongwan Tunnel. The retaining wall is built and the drainage ditch is prepared for 1# spoil ground at entrance of Xiondongwan Tunnel

Table 4-14: Implementation Details of Environmental Protection of Various Bid Sections (LYS-9)

Contractor: Project management department of LYS-9 Bid Section of Lanzhou-Chongqing Railway of China Railway 18th Bureau Group Co., Ltd.			Supervisor: Zhengzhou Zhongyuan Construction Supervision Co., Ltd.			
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Construction area at entrance	Set up the garbage pond and periodically and collectively burn and bury it in depth.	Set the sedimentation tank, septic tank; and it is forbidden to directly discharge to riverway.	13	35	Self-built
	No. 2 society in Banmiao Village of Shijingpu Township	Set up the garbage pond and periodically and collectively burn and bury it in depth.	Set the sedimentation tank, septic tank; and it is forbidden to directly discharge to riverway.	5	20	Self-built
	No. 6 society in Shizi Village of Baiguo Township	Set up the garbage pond and periodically and collectively burn and bury it in depth.	Set the sedimentation tank, septic tank; and it is forbidden to directly discharge to riverway.	2	40	Self-built

Tunnel longer than 1000 m	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
	Meilingguan Tunnel	DK607+330-DK615+605	8275	At the entrance and exit of inclined shaftspoil ground

Super-major Bridge, Major Bridge	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
	Wangjiayan No. 1 Major Bridge	DK606+713.25-DK606+861.6	130	Set up slurry pond and discarded soil and it is collectively transported to spoil ground.
	Wangjiayan No. 2 Major Bridge	DK607+168.94-DK607+329.1	160.1	Set up slurry pond and discarded soil is collectively transported to spoil ground.

Major soil/spoil (Slag) Sites	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
	Spoil ground at entrance	DK607+329	$50\times10^4m^3$, 99 mu, flattened and afforestation	50	Retaining wall completed
	Spoil ground of inclined shaft	DK611+713	$50\times10^4m^3$, 108 mu, flattened and afforestation	50	Retaining wall under construction
	Spoil ground at exit	DK615+585	$50\times10^4m^3$, 117 mu, flattened and afforestation	50	Retaining wall under construction

Investigation Situation	Spoil ground at entrance ofMeilingguan Tunnel. Retaining wall and drainage ditch are built, and the preparation is finished, it is built into mushroom cultivation field by the local authority. The farmland irrigation system is built.

Table 4-15: Implementation Details of Environmental Protection of Various Bid Sections (LYS-10)

Contractor: Project management department of LYS-10 Bid Section of Lanzhou-Chongqing Railway of China Railway Erju Group Co., Ltd.			Supervisor: Supervision Station of LYJL-9 Bid Section of Lanzhou-Chongqing Railway of Sichuan Tieke Construction Supervision Company			
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Division I: Taigong Town of Yuanba District in Guangyuan City	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Rent
	Entrance of Zhongjiashan Tunnel: Yuanbai Village of Shijingpu Township	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Exit of Zhongjiashan Tunnel: Hongwei Village of Taigong Town	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Entrance of Xuanzhenguan Tunnel Hongwei Village of Taigong Town	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Fengjiaping Village in Bailinggou Town of inclined shaft of Xuanzhenguan Tunnel	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	3	100	Self-built
	Exit of Xuanzhenguan Tunnel Liuzhuang Village of Zhangjia Township of Taigong Town	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Entrance of Siangshan Tunnel Jianshan Village of Zhangjia Township of Sifangshan Tunnel	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Team 9	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Rent
	Second Division	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built

	Jinzi Village in Zhangjia Township of Taigong Town in inclined shaft of Sifangshan Tunnel	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	3	115	Self-built
	Exit of Siangshan Tunnel Fengshan Village of Yuanxi Township	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Sancha Village of Yuanxi Town at entrance of Xiaojialiang Tunnel	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Santai Village in Zheshui Township at exit of Xiaojialiang Tunnel	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Self-built
	Sancha Village in Yuanxi Town of Bridge group	Garbage can and collectively buried	Grade 3 sedimentation and then discharge clean water.	0	0	Rent

	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
Tunnel longer than 1000 m	Zhongjiashan Tunnel	DK615+757~ DK621+420	5683 (Completed)	Yuanbai Villge in Shijingpu Township and Hongwei Village of Taigong Town
	Xuanzhenguan Tunnel	DK623+672~ DK631+119	7447 (Completed)	Spoil ground of Hongwei Village of Taigong Town, Fengjiaping Village of Baigouling Town and Liuzhuang Village of Zhangjia Township
	Sifangshan Tunnel	DK631+367~ DK639+235	7868 (Completed)	Jianshan Village of Zhangjia Township, Jinzi Village and Sancha Village of Yuanxi Township
	Xiaojialing Tunnel	D1K642+090~ D1K647+305	5215 (Completed)	Santai Village in Zheshui Township and Sancha Village in Yuanxi Township

	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
Super-major Bridge, Major Bridge	Jiaodigou Double-line Major Bridge	DK621+824.45~ DK622+294.75	384.84 (Completed)	Collectively pile soil for planting and transport the rest to spoil ground of Taigong Station.
	Receiving Departure Track Major Bridge on Left of Jiaodigou	DK621+818.97~ DK622+298.35	378.34 (Completed)	Collectively pile soil for planting and transport the rest to spoil ground of Taigong Station.
	Receiving Departure Track Major Bridge on Right of Jiaodigou	DK621+816.18~ DK622+271.7	382.86 (Completed)	Collectively pile soil for planting and transport the rest to spoil ground of Taigong Station.

	Mujiajiao Major Bridge	DK623+078.05~ DK623+502.55	484.5 (Completed)	Collectively pile soil for planting and discard the rest to 120m on left of DK623+400.
	Fengshan Major Bridge	DK639+309.03~ DK639+455.98	685.41 (Completed)	Pile it near the bridge site and build the retaining wall or revetment.
	Sanchakou Double-line Super-major Bridge	D1K641+257.42~ DK642+045.2	146.95 (Completed)	Collectively pile soil for planting; negotiate to government about the rest discarded soil and build retaining wall.

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Spoil ground at entrance of Zhongjiashan Tunnel	60m on right side of DK615+450	$39\times10^4m^3$, 114 mu	45	Completed
	Spoil ground of Taigong Station	On right side of DK621+800	$26.57\times10^4m^3$, 46 mu	26.57	Completed
	Spoil ground at exit of Zhongjiashan Tunnel	350 meter on left side of DK622+850	$36\times10^4m^3$, 67.8 mu	41.3	Completed
	Spoil ground at entrance of Xuanzhenguan Tunnel	120 m on left side of DK623+400	$23.13\times10^4m^3$, 69.2 mu	34	Completed
	Inclined shaft's spoil ground of Xuanzhenguan Tunnel	800m on left side of DK624+200	$47.76\times10^4m^3$, 58.5 mu	32.9	Completed
	Spoil ground at exit of Xuanzhenguan Tunnel	1200m on right side of DK631+000	$53.75\times10^4m^3$, 84.8 mu	64.6	Completed
	Spoil ground at entrance of Sifangshan Tunnel	2500m on left side of DK631+370	$34.85\times10^4m^3$, 50.3 mu	63.8	Completed
	Inclined shaft's spoil ground of of Sifangshan Tunnel	950m on right side of DK633+600	$38\times10^4m^3$, 56 mu	26.7	Completed
	Spoil ground at exit of Sifangshan Tunnel	150m on right side of DK639+800	$47\times10^4m^3$, 95.6 mu	31.2	Completed
	Spoil ground of roadbed	On right side of DK640+750	$48\times10^4m^3$, 73.mu	26.1	Completed
	Spoil ground at entrance of Xiaojialiang Tunnel	200m on left side of DK642+050	$48\times10^4m^3$, 73mu	30	Completed

	Spoil ground at exit of Xiaojialiang Tunnel	200m on right side of DK647+800	$42\times10^4m^3$, 82 mu	31.3	Completed
Investigation Situation	Taigong Station s-300 Constructed Wetland, Spoil ground at entrance of Xuanzhenguan Tunnel, and Miaozigou Double Track Major Bridge at Mujiajiao. Taigong Station s-300 Constructed Wetland is completed. Spoil ground at entrance of Xuanzhenguan Tunnel is restored and its irrigation pool and ditch are built. Vegetation is restored. Miaozigou Double Track Major Bridge at Mujiajiao is completed.				

Table 4-16: Implementation Details of Environmental Protection of Various Bid Sections (LYS-11)

Contractor: Project management department of LYS-11 Bid Section of Road and Bridge Construction				Supervisor: supervision station of LYJL-10 Bid Section of Chengdu Consulting and Supervision Co., Ltd. of China Railway Eryuan Engineering Group Co., Ltd.		
Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Zhaojiashan in Cangxi County	Collectively treated by county garbage	Discharge to the local pipeline of original sewage system.	2	49	Rented and Self-built
	Camp of Subdivision 2	Allocate garbage can and the cleaner will periodically clear.	Directly discharge the domestic sewage to sewer.	10	53	Rent
	Baishuihe River Mixing Station of Subdivision 2	Allocate garbage can and the cleaner will periodically clear.	Discharge it after sedimenting of sewage pool.	7	5	Self-built
	Laoya Town, Nanbu County	Join in the waste treatment system of the town	Self-built sewage pool	10	56	Project Department Staff quarter
Tunnel longer than 1000 m	Name	Start-stop Mileage		Progress (meters of finished hole)		Spoil Site
	Daliangshan Tunnel	DK647+852—DK650+477		2617		700m on right side of entrance of DK648+000; 260m on right side of exit of DK650+650
	Taojiawan Tunnel	DK651+618—DK654+128		2530		260m on right side of entrance of K651+340; 300m on left side of exit of K654+350
	Huangjiaping Tunnel	DK654+714—DK656+720		2012		50m on right side of entrance of K654+680 / 300m on right side of DK654+750 250m on right side of exit of K656+700
	Puchuanshan Tunnel	DK657+549—DK659+018		1469		Entrance: K657+300, 150m right
	Wangshuiya Tunnel	DK664+580—DK665+907		1327		DK665+950, about 300m right
	Lijiashan Tunnel	DK673+778—DK674+800		1022		On right side of tunnel's exit
	Yangjiashan Tunnel	DK680+379—DK682+445		2066		Left side of tunnel's exit
	Yutaishan Tunnel	DK692+240—DK693+520		1280		200m on left side of entrance
	Zhaojiawan Tunnel	DK694+698—DK695+880		1230		Neighbouring Zhenzhuba Village of Shuanglong Town
	Shuiyinxiang Tunnel	DK721+420—DK722+420		1000		300m on left side of exit

	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
Super-major Bridge, Major Bridge	Xuetangzui Double-line Super-major Bridge	DK647+318～DK647+826	499.87	Transport the discarded soil to spoil ground.
	Double-line Major Bridge over Xiaozhehe River	DK650+691～DK650+977	286.15	Transport the discarded soil to spoil ground.
	Chiliba Double-line Super-major Bridge	DK654+428～DK655+692	263.74	Transport the slurry to spoil ground after sedimenting.
	Huangjiaping Double-line Major Bridge	DK657+353～DK657+496	143.54	Transport the discarded soil to spoil ground.
	Double-line Super-major Bridge over Jialing River of Dabakou	DK659+092～DK660+216	1127.23	Transport the discarded soil to spoil ground.
	Miaoziya Double-line Super-major Bridge	DK663+102～DK663+665	562.87	Transport the discarded soil to spoil ground.
	Wangjiajv Double-line Major Bridge	DK665+966～DK666+209	242.68	Transport the discarded soil to spoil ground.
	Daliangshan Double-line Super-major Bridge	DK667+099～DK667+602	221.91	Transport the discarded soil to spoil ground.
	Yujiagou Double-line Super-major Bridge	DK673+224 (565.94m)	558.92	Treat the slurry by sedimenting and discard soil to roadbed or spoil ground of tunnel.
	Chenwangba Double-line Super-major Bridge	DK676+8883 (624m)	649.57	Treat the slurry by sedimenting and discard soil to roadbed or spoil ground of tunnel.
	Majiaba Super-major Bridge	DK682+451～DK683+206	762.8	Treat the slurry by sedimenting and discard soil to roadbed or spoil ground of tunnel.
	Lianshansi Double-line Major Bridge	DK691+607～DK691+966	358.65	Treat the slurry by sedimenting and discard soil to roadbed or spoil ground of tunnel.
	Super-major Bridge over Baishuihe River	DK683+997.5 (501.75m)	Finished	
	Yangjiabian Major Bridge	DK688+414 (305.84m)	Finished	
	Luojiawan No.1 Bridge	DK696+713～DK696+937	225.16	Slurry pond

	Luojiawan No. 2 Bridge	DK697+419～DK697+611	184.08	Slurry pond
	Luojiawan No. 3 Bridge	DK698+009～DK698+257	166.84	Slurry pond
	Guanyin'an Super-major Bridge	DK702+837～DK703+775	974.88	Slurry pond
	Bridge crossing 212 National Highway	DK710+416～DK710+584	182.53	No construction
	Jinmiao Double-line Major Bridge	DK711+126.21～DK711+361.98	235.77	Slurry pond
	Wang yue Double-line Major Bridge	DK711+823- DK712+047	267.22	Mud and discarded soil spoil ground
	Dujia Double-line Major Bridge	DK712+620- DK712+748	145.55	Mud and discarded soil spoil ground
	Pilvsi Double-line Major Bridge	DK714+262.91-DK714+620.48	357.57	Built mud pools, spoil dump yard
	Double-line Major Bridge over Xihe River	DK716+924, 342.55m	342.55	slurry pond, temporary spoil bank
	Shibaodi Double-line Major Bridge	DK718+036, 135.05m	135.05	slurry pond, temporary spoil bank Built mud pools , spoil dump yard
	Yangjiajv line Major Bridge	DK723+936.32-DK724+407.76	250.63	
	Double-line Major Bridge of Yanjiaqiao	DK727+087.65-DK727+417.90	242.74	Built mud pools, spoil dump yard
	Anfusi Double-line Major Bridge	DK727+474.70-DK727+664.90	143.10	Built mud pools, spoil dump yard
	Shatanzi Double-line Major Bridge	DK728+542, 402.40m	407.15	slurry pond, temporary spoil bank
	Zhoujiajv Double-line Major Bridge	DK729+937.40-DK730+220.20	142.96	Built mud pools, spoil dump yard
	Chenjiaba Double-line Major Bridge	DK730+340.05-DK730+522.26	77.02	Built mud pools, spoil dump yard
	Songjiazhai Double-track Major Bridge	DK732+539.77-DK732+731.45	167.89	Built mud pools, spoil dump yard
	Dingziwan No. 1 Double-line Major Bridge	DK735+459.35-DK735+664.65	201.75	Built mud pools, spoil dump yard
	Dingziwan No. 2 Double-line Major Bridge	DK735+714.74-DK735+956.01	234.19	Built mud pools, spoil dump yard

	Yuejiagou Double-line Major Bridge	DK738+667.75-DK738+847.25	80.92	Built mud pools, spoil dump yard
	Wangjiagou No. 1 Double-line Major Bridge	DK744+608.75-DK744+741.55	130.64	Built mud pools, spoil dump yard
	Wangjiagou No. 2 Double-line Major Bridge	DK744+998.35-DK745+231.75	196.79	Built mud pools, spoil dump yard
	Guanjiawan Double-line Major Bridge	DK746+165.85-DK746+294.15	118.79	Built mud pools, spoil dump yard
	Yangliuqiao Double-line Major Bridge	DK748+214.05-DK748+414.75	158.43	Built mud pools, spoil dump yard
	Zengjiajv No. 1 Double-line Bridge	DK748+725.05-DK748+925.50	119.67	Built mud pools, spoil dump yard
	Zengjiajv No. 2 Double-line Bridge	DK749+050.75-DK749+349.30	235.88	Built mud pools, spoil dump yard
	Daoshangou No.2 douyble-line bridge	DK750+049.40-DK750+255.60	206.2	Built mud pools, spoil dump yard
	Zuoquan Double-line Major Bridge	DK750+441.35-DK750+589.40	143.61	Built mud pools, spoil dump yard
	Shuijinggou Double-line Bridge	DK751+198.70-DK751+495.00	279.55	Built mud pools, spoil dump yard
	Mashangou Double-line Major Bridge	DK751+976.10-DK752+116.90	135.75	Built mud pools, spoil dump yard
	Double-line Major Bridge of Nianzigou	DK752+844.75-DK753+017.25	166.15	Built mud pools, spoil dump yard
	Luxi River No. 1 Double-line Bridge	DK753+447, 156.64m	156.58	Temporary spoil bank

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	Cangxi Station	2,500m on right side of DK663+200 200m on right side of DK661+900 100m on right side of DK662+950	147.2/221.77/ fully discarded for reclamation	147.2	Retaining wall masonry is completed, spoil ground is still in use.
	Entrance of Daliangshan Tunnel	400m on right side of D1K647+930	21/90.05/ fully discarded for reclamation	21	Be ready for masonry, and the spoil ground is still in use

	Exit of Daliangshan Tunnel	300m on right side of DK650+700	21/52.15/ fully discarded for reclamation	21	Be ready for masonry, and the spoil ground is still in use
	Entrance of Taojiawan Tunnel	260m on right side of DK651+340	21.82/90.28/ fully discarded for reclamation	21.82	Be ready for masonry, and the spoil ground is still in use
	Exit of Taojiawan Tunnel	250m left side of DK654+400	20.3/37.84/ fully discarded for reclamation	20.3	Be ready for masonry, and the spoil ground is still in use
	No.3 Exit of Huangjiaping Tunnel	700m on left side of DK657+350	22/27.92/ fully discarded for reclamation	22	Be ready for masonry, and the spoil ground is still in use
	Entrance of Puchuanshan Tunnel	150m on right side of DK657+300	22/69.14/ fully discarded for reclamation	22	Retaining wall is under masonry and the spoil ground is still in use
	Exit of Wangshuiya Tunnel	150m on right side of DK665+800	22.4/63.71/ fully discarded for reclamation	22.4	Retaining wall is under masonry and the spoil ground is still in use
	Roadbed from exit of Geziwan to entrance of Yuanshanzi	DK671+804~DK671+897	24/40.3/Flattening for recovery	24	Built
	Left side of Dalicheng abutment of Jianxikou	DK677+050	24/40.3/Flattening for recovery	24	Under construction
	Langzhong Station Yard	DK685+800	270/287.4/Flattening for recovery	180	Built
		DK685+900		90	Built
	DK707+360 subgrade spoil ground at station yard	300m on right side of DK707+360	60/98.4/Reclamation	60	Not built yet
	DK711+120 Roadbed Spoil Ground	260m on left side of DK711+000	45/44.9/Reclamation	45	Built
	Spoil ground of Wenjiawan Tunnel	DK737+560	22.2/40.89/Flattening for recovery	22.2	Built
	Lijiawan Tunnel Luojia Tunnel Spoil ground of Maoerping Tunnel	DK746+620	20.4/70/Flattening for recovery	20.4	Built
	Spoil ground of Longtoujv Tunnel	DK746+060	26.8/55.21/Flattening for recovery	26.8	Built
	Dachashan Spoil Ground	DK753+850	24.68/58.45/Flattening for recovery	24.68	Built
Investigation Situation	Langzhong Station, DK712+270 cutting, DK711+814~712+080 Wangyue Maojor Bridge sound barrier, DK712+080~712+190 subgrade sound barrier, DK712+400 subgrade spoil ground, and DK712+410 subgrade. The main station building, platform and canopy of Langzhong Station are completed, waiting hall of the station is				

	completed. Greening of DK712+270 cutting slope is completed. DK711+814~712+080 Wangyue Maojor Bridge sound barrier is completed. DK712+080~712+190subgrade sound barrier is completed. DK712+400 subgrade spoil ground is completed. Greening of DK712+410 subgrade slope is completed.

Table 4-17: Implementation Details of Environmental Protection of Various Bid Sections (LYS-12)

Contractor: CCCC Second Highway Engineering Co., Ltd.				Supervisor: Beijing Fangda Engineering Management Co., Ltd.		
	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
Construction Camp	Mozishi, Pingfangzi and exit of tunnel	Shelf team arrange the shift; collectively piled and treated	Treated by grade 3 sedimentation tank and discharged	2	5	Self-built
	Oil community of Yingxi River	Collectively piled and transported to garbage station for treatment	Use the drainage system in the town and collectively discharge.	1	50	Rent
	Group 4 of Er Village in Jingxi Town	Arrange the shift and the cleaner will clear it collectively.	Use the drainage system in the town and collectively discharge.	3	81	Rent
	Beach in Sangshuba Village	Special person in charge of; collectively piled and treated	Treated by grade 3 sedimentation tank and discharged	2	106	Self-built
	Exit of Qingquansi Toll Station	Special person in charge of; collectively piled and treated	Using settling tank and similar facilities for treatment before discharging	2	95	Self-built
	Chuanye Food Factory	For centralized treatment	After sedimenting, discharge it to sewage pipe network.	3	116	Rent
	Tangjiagou Tunnel	Special person in charge of; collectively piled and treated	Discharge it after sedimenting.	2	115	Self-built
	Jianshanpo Tunnel	Special person in charge of; collectively piled and treated	Discharge it after sedimenting.	2	102	Self-built
	Shanmiao Tunnel	Special person in charge of; collectively piled and treated	Discharge it after sedimenting.	2	110	Self-built
	Caijiaba Tunnel	Special person in charge of; collectively piled and treated	Discharge it after sedimenting.	3	105	Self-built
	Jinniu Mixing Station	Special person in charge of; collectively piled and treated	Treated by grade 3 sedimentation tank and discharged	2	85	Self-built
	Bayi Mixing Station	Special person in charge of; collectively piled and treated	Treated by grade 3 sedimentation tank and discharged	2	36	Self-built
	Lidu Mixing Station	Special person in charge of; collectively piled and treated	Treated by grade 3 sedimentation tank and discharged	2	56	Self-built
	Entrance of Bajiaowan Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	4	214	Self-built
	Exit of Bajiaowan Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	2	143	Self-built

	Huatan Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	3	194	Self-built
	Entrance of Changshenggou Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	1	91	Self-built
	Exit of Changshenggou Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	1	94	Self-built
	Sanjiaojie Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	1	119	Self-built
	Entrance of Yueliangyan Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	2	133	Self-built
	Exit of Yueliangyan Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	1	104	Self-built
	Xiangtangzi Tunnel	For centralized treatment	Use the grade 3 sedimentation tank and then discharge.	1	106	Self-built

	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
Tunnel longer than 1000 m	Dabaoshan Tunnel	D1K776+515~D1K778+812	2277	Pointed place
	Qianqiutian Tunnel	DK812+185~DK813+987	873	Pointed place
	Bajiaowan Tunnel	DK853+620~DK857+400	3770	600m on right of entrance; 200m on left of exit
	Changshenggou Tunnel	DK865+560~DK867+760	2126	100m on right of entrance; 800m on right of exit
	Yueliangyan Tunnel	DK875+648.25~DK878+300	2605	400m on left of entrance; 300m on left of exit

	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
Super-major Bridge, Major Bridge	Super-major Bridge over Jialing River	LZD1K6+190	1215.3	Transport the discarded soil to pointed place.
	Super-major Bridge over Luxihe River	D1K754+230.9~D1K754+880.2	649.3	Transport the discarded soil to pointed place.
	Changhegou Major Bridge	D1K756+534.28~D1K756+791.19	256.91	Transport the discarded soil to pointed place.
	Xiaojiamiao No. 1 Bridge	D1K760+561.75~D1K760+925.7	636.95	Transport the discarded soil to pointed place.
	Shiyuanzi Major Bridge	D2K764+806.05~D2K765+94.52	288.47	
	Xigou Double-line Super-major Bridge	DK772+520~DK773+864	1405.66	
	Guangdongyan Double-line Super-major Bridge	D1K775+239.05~D1K776+164.3	925.15	Transport the discarded soil to pointed place.

	Pancungou No. 3 Double-line Super-major Bridge	DK789+869.39~DK790+164.3	590.94	Transport the discarded soil to pointed place.
	Super-major Bridge of left Link lines in Sunjiaba	LZD2K1+328~LZD2K2+800	1519.36	
	Hejiagou No. 1 Double-line Super-major Bridge	DK780+471.5~DK781+183.9	712.4	Transport the discarded soil to pointed place.
	Hejiagou No. 2 Double-line Super-major Bridge	DK781+354.55~DK781+968.85	614.3	Transport the discarded soil to pointed place.
	Maojiagou Double-line Super-major Bridge	DK782+244.255~DK782+793.15	548.9	Transport the discarded soil to pointed place.
	Anjiagou No. 3 douyble-line bridge	D2K765+974.44~D2K766+303.83	666.25	
	Chenjiagou Double-line Major Bridge	D2K765+974.44~D2K766+303.83	329.36	Transport the discarded soil to pointed place.
	Xiangshuitan Double-line Major Bridge	D2K766+814.1~D2K767+247.2	433.1	Transport the discarded soil to pointed place.
	Gaoyagou Double-line Major Bridge	D2K771+119.49~D2K771+533.06	413.57	Transport the discarded soil to pointed place.
	Right Link lines Major Bridge in Sunjiaba	L2DK1+973.3~L2DK2+336	1519.36	Transport the discarded soil to pointed place.
	Right-line Major Bridge of Ganjingba	L2DK1+509.52~L2DK1+700.98	191.46	
	Double-line Super-major Bridge of Ganjinba	DK774+132~DK774+644	552.4	
	Major bridge of left Link lines in Ganjinba	LYD2K0+123~LYD2K0+667	340.79	
	Major bridge of left Link lines in Ganjinba	LZD2K0+119~LZD2K0+471	553.49	
	Anjiagou No. 1 douyble-line bridge	DK782+891.5~DK783+123.5	237.25	
	Anjiagou No. 2 douyble-line bridge	DK783+97.25~DK783+556	458.8	Transport the discarded soil to pointed place.
	Pancungou No. 1 double-line bridge	DK787+130.05~DK787+352.95	222.9	Transport the discarded soil to pointed place.
	Pancungou No. 2 double-line bridge	D1K789+50.91~D1K789+373.09	322.18	Transport the discarded soil to pointed place.
	Double-line Super-major Bridge over Qushuihe River	D1K791+639.47~D1K792+148.83	509.36	Transport the discarded soil to pointed place.
	Double-line Major Bridge of Yuanjiaba	DK811+796.8~DK812+39.2	242.4	Transport the discarded soil to pointed place.
	Qianqiu Double-line Major Bridge	DK814+721.4~DK814+885.9	164.5	
	Huayu Super-major Bridge	DK817+898.66~DK819+073.34	1174.68	Transport the slurry and discarded soil to spoil ground.
	Jiangjiawan Super-major Bridge	DK840+438.09 ~DK841+651.91	1213.82	Transport the slurry and discarded soil to spoil ground.

	Wenjia Double-line Super-major Bridge	DK842+305.68~DK843+36 6.33	1060.65	Transport the slurry and discarded soil to spoil ground.
	Sanshuangtan Double-line Super-major Bridge	DK851+285.67~DK851+92 1.08	635.41	Discard beside No. 1 rebar plant of Subdivision 4.
	Xiejiagou No. 1 bridge	DK852+2.63~DK852+282.0 9	279.46	Discard beside No. 1 rebar plant of Subdivision 4.
	Xiejiagou Super-major Bridge	DK852+466.03~DK853+88 69	622.66	Discard beside No. 1 rebar plant of Subdivision 4.
	Miaowan Major Bridge	DK859+635.05~DK859+86 9.72	234.67	Discard beside No. 1 rebar plant of Subdivision 4.
	Super-major Bridge over Huatanhe River	DK861+881.47~DK862+65 3.51	722.04	Discard to spoil ground close to DK861+344.
	Qinzhupo Major Bridge	DK863+597.43~DK863+99 2.30	394.87	Discard to spoil ground close to DK863+798.
	Huilongmiao Super-major Bridge	DK864+106.37~DK864+78 7.63	681.26	Discard to spoil ground close to DK864+447.
	Mafangyan Super-major Bridge	DK864+884.79~DK865+49 1.10	606.31	Discard to spoil ground close to DK865+192.
	Hetaowan Major Bridge	DK868+761.70~DK869+01 6.30	254.6	Discard to spoil ground close to DK868+889.
	Laozhulin Major Bridge	DK870+778.75~DK870+95 2.25	173.5	Discard to spoil ground close to DK870+848.
	Chenjiagou Major Bridge	DK873+57.80~DK873+396. 20	338.4	Discard to spoil ground close to DK873+227.
	Sanlingwan Major Bridge	DK874+240.7~DK874+462. 67	221.97	Discard to spoil ground close to DK874+376.
	Yueliangyan Major Bridge	DK875+475.75~DK875+64 8.25	172.5	Discard to spoil ground close to DK875+545.
	Hebaoyan Major Bridge	DK879+831.21~DK879+96 6.57	135.36	

	Name	Position Mileage	Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures	Actually borrowed / discarded soil (slag) (10^4m^3)	Construction of retaining walls and restoration of construction sites
Major soil/spoil (Slag) Sites	D1K785+700 right side subgrade spoil ground	100m on right side of D1K785+700	25.7, 16.28	6.3	Already built as per the design
	DK829+350 Spoil ground for tunnel	DK829+350	21.43, 32.45	12	Completion of building
	DK848+450 Roadbed Spoil Ground	DK848+450	27.4, 68.57	27.44	Completion of building
	DK851+300-DK852 +500 Roadbed Spoil Ground	DK852+150 left side	21, 30.559	21	Completion of building

	Spoil ground at entrance of Yueliangyan Tunnel	Entrance of Yueliangyan Tunnel	22.9, 64.034	38.4	Completion of building
	Spoil ground at exit of Yueliangyan Tunnel	Exit of Yueliangyan Tunnel	22.9, 48.224	22.9	Completion of building
Field Investigation	The Constructed Wetland of Nanchong North Station, Nanchong North Station, Wusheng Station, and Constructed Wetland of Wusheng Station. The Constructed Wetland of Nanchong North Station is completed. Main buiding station, platform and waiting hall of Nanchong North Station are completed. Main buiding station, platform and waiting hall of Wusheng Station The Constructed Wetland of Wusheng Station is completed.				

Table 4-18: Implementation Details of Environmental Protection of Various Bid Sections (LYS-14)

Contractor: Project management department of LYS-14 Section of Lanzhou-Chongqing Railway of China Railway 10th Bureau Group Co., Ltd.	Supervisor: Beijing Tiecheng Construction Supervision Co., LIMITED

Construction Camp	Site	Garbage Treatment Measures	Sewage Treatment Measures	Environmental Protection Bulletin Board (pcs)	Number of staff	Self-built or Rent
	Weituo Town in Hechuan District of Chongqing City to northern station of Chongqing City	For centralized treatment	Discharge it after grade 3 sedimentation.	193	2508	Self-built

	Name	Start-stop Mileage	Progress (meters of finished hole)	Spoil Site
Tunnel longer than 1000 m	Xinyuantongsi Tunnel	DK895+460～DK896+516	1056	Xinyuantongsi Spoil Ground
	Songlinbao Tunnel	DK902+922～DK904+380	1436	Exit (Yanjing Town) and entrance (office of Yinjing Street in Yinwo Village)
	Jingzhulin Tunnel	DK904+916～DK909+107	4180	Exit (Chengjiang Town), entrance and inclined shaft (Yanjing Town)
	Xinganbazi Tunnel	DK910+347～DK912+014	1666	Entrance (Chengjiang Town)
	Xishanping No. 1 Tunnel	DK913+552～DK916+464	2343	DK913+400, 500m left; DK916+800, 800m left
	Tongzilin Tunnel	DK920+952～DK923+489	1276	Huajiangou of Moxinpo Village at entrance and Group 27 of Zhongxin Village in Shuitu Town at exit
	Longfeng Tunnel	DK923+940～DK929+150	5214	Entrance (Huahongshe of Shijialiang Town), inclined shaft (Shizi Village of Shijialiang Town) and exit (Shanlinkoushe of Caijiagang Town)
	Renhechang Tunnel	DK948+083～DK951+577	4450	Dashi Spoil Ground in Zhulin Town of Chongqing City

	Name	Start-stop Mileage	Progress (meters of finished bridge)	Treatment of slurry and discarded soil
Super-major Bridge, Major Bridge	Double-line Major Bridge of Chengziwan	DK881+814.35～DK882+118.73	304.38	Slurry and discarded soil are transported to spoil ground.
	Chengziwan No. 1 bridge for connecting line	LYDK0+268.23-LYDK0+578.66	314.43	Slurry and discarded soil are transported to spoil ground.
	Chengziwan No. 2 bridge for connecting line	LYDK0+609.02-LYDK0+808.25	199.23	Slurry and discarded soil are transported to spoil ground.
	Chengziwan No. 3 bridge for connecting line	LYDK0+859.66-LYDK1+132.54	272.88	Slurry and discarded soil are transported to spoil ground.

	Xinhuilong Four-line Major Bridge	DK885+449.92～DK885+627.54	209.3	Slurry and discarded soil are transported to spoil ground.
	Three-line Super-major Bridge over Fujiang River in Xinchuanjing	DK887+108.88～DK888+153	1044.9	Discharge the slurry after sedimenting.
	Double-line Major Bridge of Zhangjiagou	DK888+873.54～DK890+291.89	356.28	Discarded to waste land not affecting environment; after construction, repair the sloping surface and recover vegetation.
	Double-line Major Bridge of Tieluoping	DK889+798.6～DK890+170.25	278.43	
	Double-line Super-major Bridge of Yuhuangguan	DK890+497.45～DK891+120.49	530.33	
	Double-line Major Bridge of Naizishan	DK891+414.35～DK891+728.35	266.86	
	Double-line Major Bridge of Baiheling	DK891+979.1～DK892+119.9	79.21	
	Double-line Major Bridge of Hualangou	DK892+213.07～DK892+685.79	298.84	
	Double-line Major Bridge of Chenjiawan	DK892+979.42～DK893+086.58	62.77	Discarded to waste land not affecting environment
	Double-line Super-major Bridge over Xinlindu River	DK893+409.43～DK894+316.88	714.52	
	Double-line Major Bridge of Xinzhilubei	DK901+551.7～DK901+781.7	230	
	Double-line Major Bridge of Xinlaofangzi	DK902+275.3～DK902+750.8	475.5	
	Double-line Major Bridge of Kanjixiao	DK904+390.65～DK904+380	370.7	
	Double-line Super-major Bridge over Xinchengjiang River	DK909+602.59～DK910+340.11	737.5	
	Double-line Super-major Bridge over Jialing River in Xincaojie	DK912+29.4～DK913+30.52	1001.3	
	Double-line Super-major Bridge of Longmen	DK917+814.76～DK918+871.6	847.99	The field grade 3 sedimentation tank will treat the sewage and discard the soil to pointed spoil ground.
	Double-line Super-major Bridge of Liujiagou	DK919+717.86～DK920+570.86	1233.34	
	Niucaoba Major Bridge	DK920+694.48～DK920+925.78	196.8	
	Double-line Super-major Bridge over Jialing River in Tongzilin	DK923+475.89～DK923+937.09	463.3	Transported to spoil ground by special car.
	Double-line Major Bridge of Guojiagou	DK929+200.65～DK929+398.08	197.43	Transported to spoil ground by special car.
	Double-line Major Bridge of Wafangzi	DK930+118.3～DK930+479	360.7	

	Double-line Major Bridge of Zhichanggou	DK931+215.4～DK931+593.5	360.7	Transported to spoil ground by special car.
	Caijia No. 1 Double-line Bridge	DK931+215.4～DK931+593.5	378.1	Transported to spoil ground by special car.
	Caijia No. 2 Double-line Bridge	DK932+83.75～DK932+215.55	131.8	Transported to spoil ground by special car.
	Caijia No. 3 Double-line Bridge	DK932+508.8～DK932+610.15	101.35	Transported to spoil ground by special car.
	Caijia No. 4 Double-line Bridge	DK932+791.45～DK932+898.55	107.1	Transported to spoil ground by special car.
	Caijia No. 5 Double-line Super-major Bridge	DK933+073.75～DK933+272.95	199.2	Transported to spoil ground by special car.
	Tongjiaxi No. 1 Double-line Bridge	DK936+324.52～DK936+475.46	82	Transported to spoil ground by special car.
	Double-line Super-major Bridge of Xinhuangjiaoshu	DK939+076～DK939+810	624.24	Discarded to pointed spoil ground
	Double-line Super-major Bridge over Jialing River of Xinjingkou (passenger line)	DK940+883.1～DK943+286.56	1795.69	Transported to spoil ground by special car.
	Double-line Super-major Bridge over Jialing River of Xinjingkou (goods line)	HDK6+626.33～HDK9+553.23	1444.23	Transported to spoil ground by special car.
	No. 102 to 105 pier of Double-line Major Bridge over Jialing River of Xinjingkou (four-line)	DK943+744.35～944+059.45	124.64	Transported to spoil ground by special car.
	Double-line Super-major Bridge of Overpass of Jinzhou Highway	DK945+324.85～DK946+646.75	1321.9	Transported to spoil ground by special car.

	Name	**Position Mileage**	**Designed qty. (10^4m^3) of soil to be borrowed / discarded, occupied acreage, recovery measures**	**Actually borrowed / discarded soil (slag) (10^4m^3)**	**Construction of retaining walls and restoration of construction sites**
Major soil/spoil (Slag) Sites	Subgrade spoil ground at Lanzhou-Chongqin Railway	50m on right side of DK882+533~+675	$4.1\times10^4m^3$, 22.614 mu	12	Retaing and drainage has been completed and the vegatation has been recovered
	Subgrade spoil ground at link line	120m on right side of LYDK1+250	$3.95\times10^4m^3$, 28.224 mu	14.4	Retaing and drainage has been completed and the vegatation has been recovered
	Subgrade spoil ground at Weituo Station	50m on right of DK885+219～+256	$1.01\times10^4m^3$, 18.39 mu	22.1	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground at entrance of Xinzuofang Tunnel	800m on left side of DK888+160～+200	$10.4\times10^4m^3$, 23.442 mu	20	Retaing and drainage has been completed and the vegatation has been

					recovered
	D1K888+955～DK889+317 Spoil ground of roadbed	300m on left side of DK 889+050	$17\times10^4m^3$, 27.7mu	8	Retaing and drainage has been completed and the vegatation has been recovered
	D1K889+284, 4～+810, 5 Spoil ground of roadbed	200 m on right side of DK 889+300	$11.9\times10^4m^3$, 43.554.8mu	14	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground of Zhangjiagou Subgrade Spoil ground at exit of Xinzuofang Tunnel	400 m on right side of DK 888+700	$16.33\times10^4m^3$, 35.2335mu	20	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground of Zhangjiagou Subgrade Spoil ground at exit of Xinzuofang Tunnel	546.81 yd on right side of DK 888+700	$11.26\times10^4m^3$, 24/99 mu	15	Retaing and drainage has been completed and the vegatation has been recovered
	D1K890+621, 8～+955 Spoil ground of roadbed	430 m on right side of DK 890+760	$26.36\times10^4m^3$, 45.6465 mu	13	Retaing and drainage has been completed and the vegatation has been recovered
	D1K890+681～+824 Spoil ground of roadbed	546.81 yd on right side of DK 890+760	$4.66\times10^4m^3$, 36.873 mu	25	Retaining structure has been constructed.
	D1K892+678～+980 Spoil Ground of Niubeiji Tunnel		$1\times10^4m^3$, 18.882.8mu	0	Retaining structure has been constructed.
	D1K893+185～+409 Spoil ground at Shamaoshan Tunnel		$4.3\times10^4m^3$, 10.05.8mu	5	Retaining structure has been constructed.
	Zhulinwanshangshizi Tunnel Spoil ground of roadbed	100 m on right side of DK894+400	$2.7\times10^4m^3$, 29.6055 mu	22	Retaining wall is not needed if the height of filling is less than 2m.
	D1K894+785～+816 Spoil ground of roadbed	596 m right side of DK894+763	$1.3\times10^4m^3$, 5.3055mu	1.5	Retaining structure has been constructed.
	Xinyuantongsi Tunnel (Station) Dumping Site	200 m right side of DK897+400	$12\times10^4m^3$, 19.7505mu	11	Reclamation Completed
	Fushanyan Tunnel Dumping Site	500 m on right side of DK900+440	$8\times10^4m^3$, 13.3755mu	7	Reclamation Completed
	Spoil ground of roadbed	100 m on left side of DK902+250	$14.6\times10^4m^3$, 34.875mu	14	Retaining structure has been constructed.
	Spoil ground of roadbed	500m on left side of DK902+670	$3.5\times10^4m^3$, 7.8 mu	3.5	Retaing and drainage has been completed and the vegatation has been recovered
	Entrance of Jinzhulin Tunnel	800 m left side of DK904+910	$62\times10^4m^3$, 55 mu	60	Retaining structure has been constructed.

	Inclined shaft Spoil ground of Songlinbao Tunnel				
	Exit of Jinzhulin Tunnel Xinganbazi Tunnel Spoil ground of roadbed	750 m on left side of DK909+200	55×104m^3, 75 mu	52	Retaining structure has been constructed.
	Spoil ground of roadbed	100 m on left side of DK902+250	15×$10^5$$m^3$, 34.8 mu	14	Retaing and drainage has been completed and the vegatation has been recovered
	Xishanping 1#~TongzihaoTunnel roadway and tunnel sharing spoil ground	250 m on left side of DK913+130	4.06×$10^5$$m^3$, 42mu	48.2	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground at exit of Xishanping No. 1 Tunnel	300 m on left side of DK916+800	22.9×$10^4$$m^3$, 20.742 mu	22.9	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground of roadbed	300 m on left side of DK916+800	8×$10^4$$m^3$, 20.742mu	7	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground of roadbed	100 m on left side of DK918+071	6.2×10^4m3, 17.679 mu	6.2	Rectification of spoil ground is almost completed
	Spoil ground of roadbed	100 m on left side of DK918+700	18×104m^3, 39.555 mu	18	Rectification of spoil ground is almost completed
	Spoil ground at entrance of Tongzilin Tunnel	4,000 m on left side of DK920+100	17.9×$10^4$$m^3$, 25.2435 mu	17.9	Retaing and drainage has been completed and the vegatation has been recovered
	DK920+570～+980 Roadbed Spoil Ground	4,000 m on left side of DK920+100	2.4×$10^4$$m^3$, 6 mu	2.4	Rectification of spoil ground is almost completed
	Tongzilin Tunnel exit Dumping Site Dumping Site	5,000 m on left side of DK923+490	22.9×$10^4$$m^3$, 39 mu	23	Blocking and drainage measures have been taken, vegetation has been restored.
	Roadbed Spoil Ground	450m on left side of DK930+680	18.5×$10^4$$m^3$, 46.2 mu	12.2	Has been delivered to the local authority
	Entrance of Longfeng Tunnel Dumping Site	2,700 m on right side of DK925+500	54×$10^4$$m^3$, 80 mu	2	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground at exit of Longfeng Tunnel	3,360 m on left side of DK933+650	36×$10^4$$m^3$, 50.02mu	3	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground for inclined shaft of Longfeng Tunnel	1,200 m on left side of DK927+400	20.7×$10^4$$m^3$, 44.4mu	15	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground of roadbed	300 m on right side of DK932+270	18.5×$10^4$$m^3$, 46.2 mu	12.2	Retaining wall completed

	Spoil ground of roadbed	350 m on right side of DK932+830	$10.7\times10^4m^3$, 26.8 mu	7.3	Retaing and drainage has been completed and the vegatation has been recovered
	Spoil ground of roadbed	460 m left side of DK933+397	$6.6\times10^4m^3$, 12.3 mu	3.2	Retaing and drainage has been completed and the vegatation has been recovered
	DK934+108～DK934+500 Spoil ground of roadbed	200 m on right side of DK934+194	$11.2\times10^4m^3$, 34.6 mu	11.2	Retaining wall completed
	DK934+500～DK936+324 Spoil ground of roadbed	500 m on left side of DK935+600	$5\times10^4m^3$, 12.39mu	4.5	Retaing and drainage has been completed and the vegatation has been recovered
	DK934+500～DK936+324 Spoil ground of roadbed	400 m on left side of K935+700	$22.4\times10^4m^3$, 56.085 mu	20	Retaing and drainage has been completed and the vegatation has been recovered
	DK934+500～DK936+324 Spoil ground of roadbed	300 m on left side of DK935+950	$4.9\times10^4m^3$, 12.327 mu	3.4	Retaining wall completed
	DK934+500～DK936+324 Spoil ground of roadbed	400 m on left side of DK936+020	$33.4\times10^4m^3$, 83.58 mu	21	Retaing and drainage has been completed and the vegatation has been recovered
	DK936+475～DK937+000 Spoil ground of roadbed	280 m on left side of DK936+560	$19.7\times10^4m^3$, 49.452 mu	16.2	Retaing and drainage has been completed and the vegatation has been recovered
	No 1 and 2 spoil ground for Tong Jiaxi tunnel	450 m on left side of DK937+500	$13.35\times104m^3$, 41.88 mu	14	Retaining structure has been constructed.
	No 1 spoil ground for Tong Jiaxi tunnel	385 m on left side of DK935+930	$10\times10^4m^3$, 23.68 mu	10	Retaining structure has been constructed.
	Spoil ground at Tongxing Tunnel	60 m on right side of DK940+100	$4.59\times10^4m^3$, 18.26 mu	5	Retaing and drainage has been completed and the vegatation has been recovered
	DK938+110～DK940+076 Spoil ground of roadbed	280 m on right side of DK940+224	$6\times10^4m^3$, 15 mu	6	Retaing and drainage has been completed and the vegatation has been recovered
	DK938+110～DK940+076 Spoil ground of roadbed	300 m on left side of DK938+400	$44\times10^4m^3$, 74.76mu	30	Retaining structure has been constructed.
Investigation Situation	Hechuan Station, the constructed wetland of Hechuan Station, and the Fourth Branch Campsite. The waiting hall of Hechuan Station has been put into service. the constructed wetland of Hechuan Stationtrain has been delivered to Chongqin depot for usage and managemen. The Fourth Branch Campsite has been delivered to the local authority for usage and the handling-over procejure has been handled.				

4.2 Brief Summary

According to table of environmental protection of each contractor in 2015, refer to Table 4-19 for the main environmental and water protection engineering along whole line of new Lanzhou-Chongqing Railway:

Table 4-19: Summary Sheet of Main Environmental and Water Protection Engineering for Lanzhou-Chongqing Railway

Bid Section No.	Contractor	Dumping Site (10^4m^3)							Tunnel ≥1,000m		Super-major Bridge and Major Bridge	
		Total Number (pcs)	≤2	2～20	20 ～50	50～100	≥100	Total Quantity	Total	≥3000m	Total	Super-major Bridge
LYS-1-1	China Railway 10th Bureau Group Co., Ltd.	1			1			35	1	1	6	4
LYS-1-2	China Railway 19th Bureau Group Co., Ltd.	17		5	10	2		540	4	2	2	0
LYS-2	China Railway 16th Bureau Group Co., Ltd.	26		10	14	2		765.43	10	6	11	5
LYS-3-1	China Railway Tunnel Group	20		2	14	4		773.1	4	4	3	0
LYS-3-2	China Railway 7th Bureau Group Co., Ltd.	11		4	6	1		355	3	2	9	6
LYS-4-1	China Railway 11th Bureau Group Co., Ltd.	8		1	2	4	1	480.1	3	3	3	0
LYS-4-2	China Railway 13th Bureau Group Co., Ltd.	22		10	11	1		562，9	6	3	11	8
LYS-5	CCCC Second Highway Engineering Co., Ltd.	9		2	6	1		283．87	4	4	7	5
XQLS1	China Railway 18th Bureau Group Co., Ltd.	5		1	1	3		266.8	2	2	0	0

XQLS2	China Railway Tunnel Group	3				1	2	506	1	1	3	1
LYS-6	CCCC First Harbor Engineering Co., Ltd.	29		12	13	4		940．35	10	9	11	2
LYS-7	China Railway 21st Bureau Group Co., Ltd.	8			7	1		312.9	2	2	18	7
LYS-8	China National Coal Group Corporation	5		3		2		191.5	1	1	1	0
LYS-9	China Railway 18th Bureau Group Co., Ltd.	3			3			150	1	1	2	0
LYS-10	China Railway Erju Group Co., Ltd.	12			11	1		482．05	4	4	6	1
LYS-11	China Road & Bridge Corporation	104	8	79	14	1	2	1617.21	10	0	47	10
LYS-12	CCCC First Highway Engineering Company Ltd.	124	4	98	6			949.2	7	1	57	18
LYS-14	China Railway 10th Bureau Group Co., Ltd.	48	3	32	10	3		803.18	8	3	38	13
Total		**455**	**15**	**259**	**130**	**30**	**5**	**9977.12**	**79**	**49**	**223**	**80**
Note: Nanping Tunnel and Hatapu Tunnel are constructed by two contractors and counted up only at one contractor: the left line and right line of West Qinlin Tunnel are counted up based on two tunnels.												

We can see from Table 4-19 *Summary Sheet of Main Environmental Protection and Water Conservation Engineering for Lanzhou-Chongqing Railway* that there are 455 spoil grounds in total being used in the whole line of Lanzhou-Chongqing Railway at present. Through dividing the abandoned dreg volume and among the 439 spoil grounds with statistical data: there are 5 spoil grounds with an abandoned dreg volume more than (equals to) 1 million cubic meters; there are 30 spoil grounds with an abandoned dreg volume between 0.5 million (not be included) and 1 million (not be included) cubic meters; there are 130 spoil grounds with an abandoned dreg volume between 0.2 million (not be included) and 0.5 million (included) cubic meters; there are 274 spoil grounds with an abandoned dreg volume less than (included) 0.2 million cubic meters; The total abandoned dreg volume is nearly 99.7712 million cubic meters. There is no big change between the statistical data and the previous report. For Lanzhou-Chongqing Railway, there are 79 Tunnels more than 1,000 meters long, among which 49 tunnels are more than (equal to) 3,000 meters long and the total length of which is 387,908 hole meters taking up 47.3% of the total length of Lanzhou-Chongqing Railway. There are 223 super-major and major bridges along Lanzhou-Chongqing Railway, of which there are 80 super-major bridges with the total length of 90920.54 bridge meters, accounting for 11.09% of the total length of Lanzhou-Chongqing Railway.

4.2.1 Situation of spoil ground and borrow pit

To implement the requirements of Lanzhou-Chongqing Railway Co., Ltd. on rectification of spoil ground, eliminate the potential safety hazards of parts of spoil grounds and accelerate the progress of rectification of spoil ground, the Company will regard the work of comprehensive rectification of spoil ground as a top priority of this year's environmental protection and water conservation work with great effort on it. Through this investigation, we can see that the comprehensive rectification of spoil ground has achieved remarkable effects.

4.2.1.1 The rectification and recovery of spoil ground has achieved remarkable effects and handled the handing-over procedures with the mature conditions

90% of spoil grounds have completed the task of discarding the residue and 10% of spoil grounds that are still being used have a small amount of task of discarding the residue. Have built all the retaining walls, intercepting dikes and drainage ditches as per the requirements, completed the spoil grounds and prepared the slope and site, part of spoil grounds have been delivered and handled the handing-over procedures; part of site has been locally developed and used to build the city street gardens or commercial operation site or the breeding bases for the agricultural and sideline products. 22 of 28 spoil grounds by China Railway 16th Bureau Group Co., Ltd. have already been handled the handing-over procedures.

Photo 1. 22 of 28 spoil grounds by China Railway 16th Bureau Group Co., Ltd. have already been handled for the handing-over procedures.

Photo 2. The spoil grounds of Taoshuping 2# tunnel by China Railway 21th Bureau Group Co., Ltd. have been locally developed and used to build the commercial operation site.

Photo 3. The spoil grounds at the exit of Huama Tunnel by China Railway 13th Bureau Group Co., Ltd. have been locally used to build to be Shixia village cultural square.

Photo 4. The spoil ground at the exit of Minglingguan Tunnel by China Railway 18th Bureau Group Co., Ltd. have been built the retaining walls and the drainage ditches, after the completion, they have been locally built to be mushroom breeding bases and the farm irrigation system has been established.

4.2.1.1 The rectification and recovery of spoil ground has achieved remarkable effects

We can see from the situation of the environmental control sampling survey that the proportion of completing the retaining wall for spoil ground along the whole line of Lanzhou-Chongqing Railway has reached 95% within one year from 2014 to the period of this investigation and the proportion of completing and implementing this retaining engineering has been increased.

The engineering of slag discharging for most spoil grounds has been finished, part of spoil grounds have been covered with the surface soil, restored to cultivate the crops or plant trees for afforestation or the site has been locally developed and used; part of spoil grounds have been signed or handled the agreement for second ploughing with the local government; some of spoil grounds have been built the retaining walls, intercepting dikes and drainage ditches, completed the rectification of surface or slope cutting of classification bascially for restoring the original function of the land; the ditches and retaining walls for some of spoil grounds have been restored and reinforced.

4.2.1.2 Part of spoil grounds have been completed the retaining engineering, and being conducted the the rectification of surface or slope cutting of classification for restoring the original function of the land.

Part of spoil grounds have completed the engineering of slag discharging or the engineering of slag discharging has entering into the final stage, have built or being built the retaining walls, intercepting dikes and drainage ditches, completed the rectification of surface or slope cutting of classification bascially; part of spoil grounds that the discarded slag overflew out of the slag wall require to be leveled and taken back, the difficulty of the engineering for recovery is not big.

Photo 5. The retaining wall and the spillway for spoil grounds along the Donggu Road by China Railway 19th Bureau Group Co., Ltd. have been built.

Photo 6. The retaining walls for spoil grounds at the exit of Shouyangshan Tunnel by China Railway 16th Bureau Group Co., Ltd. have been built and the rectification for surface of the drainage ditch has been completed.

Photo 7. The blocking dregs dam and the drainage ditch for spoil grounds of Daping Track by China Railway Tunnel Group have been built.

Photo 8. The Luzha newly added spoil grounds by China Railway Tunnel Group have sent forth the vegetation.

Photo 9. The built drainage ditches for spoil grounds at the extrance of Zhifang Tunnel by China Railway 7th Group Co., Ltd. have been covering with the soil.

Photo 10. The retaining walls along the river for spoil grounds of water carrying ditch of Xinchengzi Tunnel by China Railway 11th Group Co., Ltd. have been built and the intercepting dikes built along the foot of a mountain have been covering with the soil for recovery.

Photo 11. The rectification for 2# spoil ground at the exit of Tianchiping Tunnel by China Railway 13th Bureau Group Co., Ltd. has been completed and being covered with the soil.

Photo 12. The rectification for 1# spoil ground at the exit of Tianchiping Tunnel by China Railway 13th Bureau Group Co., Ltd. has been completed and being covered with the soil.

Photo 13. The retaining walls for spoil grounds of Dayuanba by China Railway 18th Bureau Group Co., Ltd. have been built and the site has been leveled.

Photo 14. The spillway for spoil grounds at the entrance of Yangjiashan Tunnel by CCCC FIRST HARBOR ENGINEERING COMPANY LTD. has been built.

Photo 15. The drainage ditches for spoil grounds of Guanziling Tunnel by CCCC FIRST HARBOR ENGINEERING COMPANY LTD. has been built and the site has been leveled.

Photo 16. The retaining walls and drainage ditches for 2# spoil grounds at the entrance of Xiongdongwan Tunnel by China Coal No.3 Construction (group) Corporation Ltd. have been built.

Photo 17. The retaining walls for 1# spoil grounds at the entrance of Xiongdongwan Tunnel by China Coal No.3 Construction (group) Corporation Ltd. have been built and the rectification for the drainage ditches has been completed.

Photo 18. The spoil grounds at the entrance of Xuanzhenguan Tunnel by China Railway Erju Group Co., Ltd. have restored the vegetation and repaired and built the irrigatio pond.

Photo 19. The spoil grounds of DK712+400 subgrade by Road and Bridge International Co., Ltd. have been restored.

4.2.1.3 Problems Require to be concerned during rectification of spoil ground

The individual spoil ground has the conditions for restoration; take a firm hold of the rectification, converge the slope toe, level the spoil ground and cover the soil for restoration to reduce the influences of slag discharging on the surrounding environment.

Photo 20. The retaining walls for spoil grounds of Liyuangou by China Railway Tunnel Group have been built, but the site has not been restored and leveled.

4.2.2 Bridge construction and site recovery conditions

Based on the results of this suvery, the construction of piers and abutments for 6 major and super-major bridges have been fully completed and most of the constructon site have been restored basically. The construction wastes in the individual construction site require to be removed for restoring the original landform. Most construciton site of bridges can conduct good management through implementing relevant requirements for environmental protection and water conservation, engineering progress goes more smoothly, the site equipment under the bridge have been dismantled, the site has been restored the original landform and the piers over the water have been restored.

Photo 21. The construction fro 1# Super-major Bridge across the Taohe River by China Railway 7th Group Co., Ltd. has been completed and the construction under the bridge has been restored.

Photo 22. The construction fro 2# Super-major Bridge across the Taohe River by China Railway 7th Group Co., Ltd. has been completed and the construction under the bridge has been restored.

Photo 23. The Yayuan Super-major Bridge by China Railway 13th Bureau Group Co., Ltd. has been completed.

Photo 24. The Chenjiaba Super-major Bridge by China Railway 13th Bureau Group Co., Ltd. has been completed.

Photo 25. The 3# Super-major Bridge across Bailong River by China Railway 13th Bureau Group Co., Ltd. has been completed.

Photo 26. The double track major bridge China of Mujiajiao Miaozigou by China Railway Erju Group Co., Ltd. has been completed.

4.2.3 Subgrade

It can be found from this survey that, all Contractors have paid more attention to the subgrade landscape and environmental protection engineering and can carry out the water conservation and environmental protection landscape engineering and the main engineering simultanously as per relevant requirements.

Photo 27. The arch skeleton of subgrade greening at the exit of Shouyangshan Tunnel by China Railway 16th Bureau Group Co., Ltd. has been completed.

Photo 28. The arch skeleton of DK136+376 cutting slope greening by China Railway 16th Bureau Group Co., Ltd. has been completed.

Photo 29. The gridding of subgrade and slope greening at the station of Zhang County by China Railway 16th Bureau Group Co., Ltd. has been completed.

4.2.4 Station name

Along with the progress of the engineering, the construction engineering of the station and station building has been carried out normally, the filling and excavating engineering of the station has been basically implemented in place and the construction of the station building has being conducted orderly.

Photo 30. The gridding of subgrade and slope greening at the station of Yaodu by CCCC FIRST HARBOR ENGINEERING COMPANY LTD. has been completed.

Photo 31. The greening for DK712+270 cutting slope by Road and Bridge International Co., Ltd. has been restored.

Photo 32. The greening for DK712+410 cutting slope by Road and Bridge International Co., Ltd. has been restored, some have been put into use or the station building, the platform and the canopy have been completed. The slope protection and greening engineering has being carried out one after another.

Photo 33. The platform and subgrade at the station of Weiyuan by China Railway 16th Bureau Group Co., Ltd. have been completed.

Photo 34. The main engineering of the station building at the station in Zhang County by China Railway 16th Bureau Group Co., Ltd.

Photo 35. The platform and the canopy at the station of Yaodu by CCCC FIRST HARBOR ENGINEERING COMPANY LTD.

Photo 36. The main station building and waiting hall at the station of Langzhong by Road and Bridge International Co., Ltd. have been completed for use.

Photo 37. The main station building at the north station of Nanchong by CCCC First Highway Engineering Company Ltd. has been built.

Photo 38. The platform and the waiting hall at the north station of Nanchong by CCCC First Highway Engineering Company Ltd. has been built.

Photo 39. The main station building at the Wusheng station by CCCC First Highway Engineering Company Ltd. has been built.

Photo 40. The station building at the Hechuan station have been put into use.

Photo 41. The waiting hall at the Hechuan station by China Railway 10th Bureau Group Co., Ltd. has been put into use.

4.2.5 Environmental protection equipment and facilities construction

As Lanzhou-Chongqing Railway is under engineering construction, according to the requirements of relevant laws and regulations of *Report of Environmental Impact Assessment, Review Opinions and Environmental Protection Regulation of Construction Projects*, Lanzhou-Chongqing Railway Co., Ltd. shall strictly implement the principles of designing, constructing and completing the enviromental protection engineering and main engineering simultanously and guiding the design, construciton and enviromental management based on the environmental assessment.

Photo 42. The sound barriers on both sides of DK711+814~712+080 Wangyue Major Bridge by Road and Bridge International Co., Ltd. have been completed.

Photo 43. The sound barriers of DK712+080~712+190 subgrade by Road and Bridge International Co., Ltd. have

been completed.

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Photo 45. The engineering of constructed wetlands at the north station of Nanchong by CCCC First Highway Engineering Company Ltd. has been completed.

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Photo 47. The constructed wetlands at the Hechuan station by China Railway 10th Bureau Group Co., Ltd. has been put into use.

4.2.6 Restoration of temporary land of construciton camps

Photo 48. The cultivation for the construciton and living areas at the exit of Longjiamen Tunnel by China Railway 16th Bureau Group Co., Ltd. has been restored.

Photo 49. The construction camps of Taishui gou pof Xinchengzi Tunnel by China Railway 11th Group Co., Ltd. have been dismantled to restore its original landform.

Photo 50. The 4th branch camps by China Railway 10th Bureau Group Co., Ltd. have been turned over for local use.

4.2.7 Tracking Circumstance about problems proposed in annual report of 2014

● The problem of spoil ground of Donggu Road of Humaling Tunnel lies in that the Contractor had received the *Approved Letter of Risk-elimination and Reinforcement Design Plan by Water Resources Department of Gansu Province on Influences of Discharged Slag of 5# Inclined Shaft and 3# Humaling Tunnel of Lanzhou-Chongqing Railway to Safe Operation of Silt Dam* in March, 2015. The spoil ground of Donggu Road has built the retaining walls along the road as per the requirements of *Approved Letter of Risk-elimination and Reinforcement Design Plan by Water Resources Department of Gansu Province on Influences of Discharged Slag of 5# Inclined Shaft and 3# Humaling Tunnel of Lanzhou-Chongqing Railway to Safe Operation of Silt Dam*, the top of the spoil ground has built the spillway and the site has been leveled.

Photo 51. The Approved Letter of Design Plan of spoil ground of Donggu Road by China Railway 19th Bureau Group Co., Ltd.

● The existing capacity for the spoil ground of Luotuoxia inclined shaft of Maoyushan Tunnel cannot meet the requirements obviously, part of the discarded slag has overflew out of the retaining wall and dropped into the Minjiang River, so there is an urgent need to enlarge the capacity to meet the requirements of discarded slag. As the director of the contractor states, the Design Institute, Longnan, China Railway 11th Group Co., Ltd, Water Supplies Bureau of Dangchang County, Linjiangpu Township Government had held the Special Conference and passed the proposal of enlarging the campacity of spoil ground in April, 2015. The original retaining walls shall be moved outward to ensure the width of the river not less than 100m. Now the contractor are preparating the new retaining walls for the construction.

5. Problems and Suggestions

1. Continue to organize the basic data related to the spoil ground

Various basic data related to the spoil ground is the important material for the completion acceptence of spoil ground and the environmental protection acceptence of engineering. It can be found from this survey that, there is still individual contractor to report the data not unified up till the present moment, so Lanzhou-Chongqing Railway Company has put a lot of effort into it. The Lanzhou-Chongqing Railway Company has been recommended to strengthen the guidance and supervision for relevant contractor to master the basic information of borrow pit and spoil ground as soon as possible to get ready for the acceptence of engineering.

2. The rectification and restoration engineering of spoil grounds shall be attached enough importance

With the progress of tunnel engineering, there are only Humaling Tunnel, Muzhailing Tunnel and Xinchengzi Tunnel still not been cut through currently, the engineering of slag discharging has entered the final building stage, so the contractors shall arrange and carry out the rectification and restoration engineering of spoil grounds reasonably and handle the handing-over procedures timely.

3. Push forward the restoration engineering of temporary land

It can be found from this survey that with the progress of the integrated engineering, many pavement, mixing stations, construciton camps and beam fabricating yards are about to be stopped for use, so the contractors shall pay more attention to restoration engineering of land function of temporary land, clean up the harden ground thoroughly after removing the construciton equipment and facilities, restore the original functions of the land and handle the handing-over procedures timely.

6. Photos

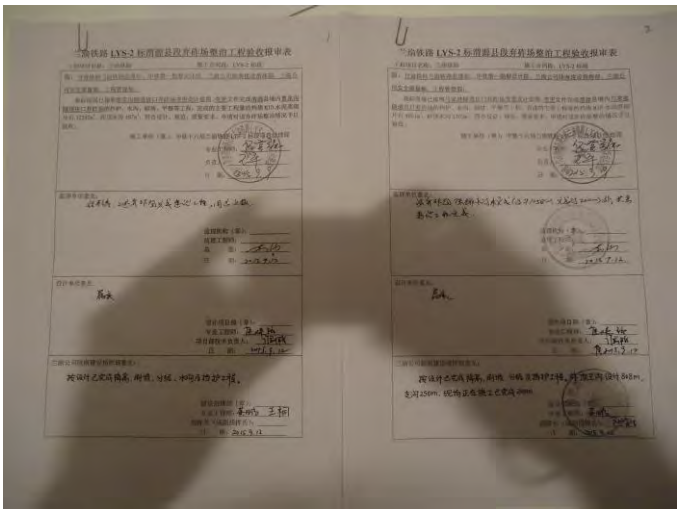

Photo 1. 22 of 28 spoil grounds by China Railway 16th Bureau Group Co., Ltd. have been handled for the handing-over procedures.

Photo 2. The spoil grounds of Taoshuping 2# tunnel by China Railway 21th Bureau Group Co., Ltd. have been locally developed and used to build the commercial operation site.

Photo 3. The spoil grounds at the exit of Huama Tunnel by China Railway 13th Bureau Group Co., Ltd have been locally used to build to be Shixia village cultural square.

Photo 4. The spoil grounds at the exit of Minglingguan Tunnel by China Railway 18 Bureau Group Co., Ltd have been built the retaining walls and the drainage ditches, after the completion, they have been locally built to be mushroom breeding bases and the farm irrigation system has been established.

Photo 5. The retaining wall and the spillway for spoil grounds along the Donggu Road by China Railway 19th Bureau Group Co., Ltd. have been built.

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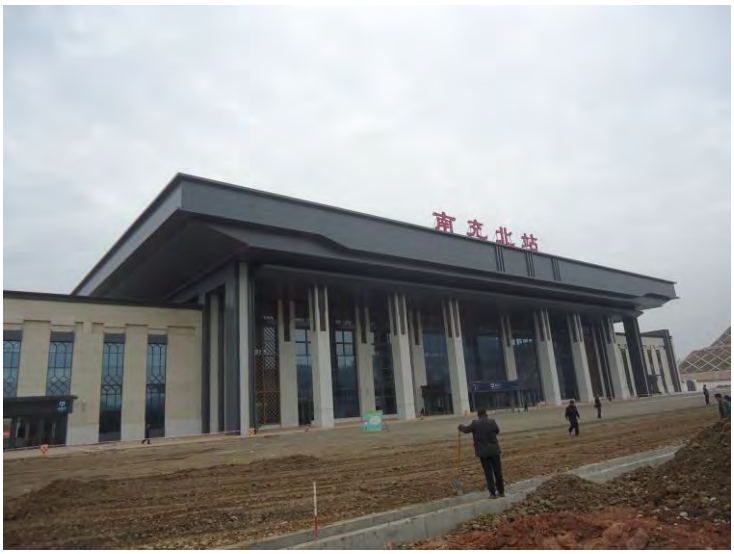

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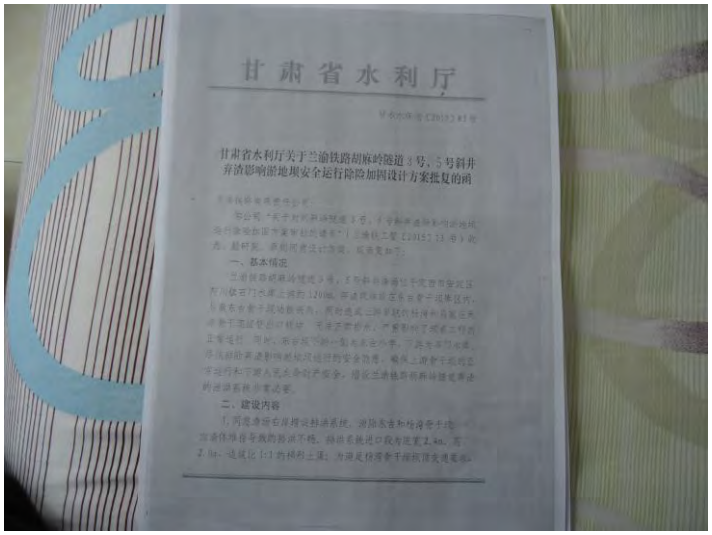

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