Environmental Impact Assessment (Draft)

May 2018

PRC: Yunnan Lincang Border Economic Cooperation Zone Development Project (Annexes)

Prepared by Lincang Border Economic Cooperation Zone Development Project, People's Republic of China for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 23 May 2018)

Currency unit	–	Chinese Yuan (CNY)
CNY1.000	=	$0.157
$1.000	=	CNY6.368

NOTE

In this report, “$” refers to US dollars.

ANNEXURES

Annexure 1: Assessment Standards of Environmental Quality

1.A: Letter of Lincang Municipal EPB

Letter of Lincang Municipal Environmental Protection Bureau

Reply to the Standard for Environment Impact Assessment for General Development Project for the Infrastructure of Yunnan Lincang Border Economic Cooperation Zone

Chongqing Holly Environment Impact Assessment Co., Ltd.,

The Letter for the Standard for Environment Impact Assessment for General Development Project for the Infrastructure of Yunnan Lincang Border Economic Cooperation Zone has been received, and it is hereby replied as below upon review:

I. Environmental Quality Standard

1. Ambient Air Quality Standard

Ambient air quality shall be subject to level-II standard in the *Ambient Air Quality Standards* (GB 3095-2012), with specific standard values shown in Table 1; ammonia and hydrogen sulfide shall be subject to the maximum allowable concentration for hazardous substances in the atmosphere in residential area in Table 1 of TJ36-79 *Health Standard for the Design of Industrial Enterprises*, with specific contents shown in Table 2; non-methane hydrocarbon shall be subject to the *Local Environmental Quality Standard of Hebei Province - Ambient Air Quality Standard* - Limit on Non-methane Hydrocarbon (DB 13/1577-2012), with specific standard values shown in Table 3.

Table 1 Limits in Level-II Standard for Ambient Air Unit: μg/m^3

S/N	Pollutant	Standard Limits		
		Average Value in 1h	Daily Average value	Annual Average
1	Particles (TSP)	—	300	200
2	Particulate matter (PM_{10})	—	150	70
3	Sulfur dioxide (SO_2)	500	150	60
4	Nitrogen oxide (NO_x)	250	100	50
5	Carbon monoxide (CO) mg/m^3	10	4	—
6	$PM_{2.5}$	—	75	35

Table 2 Table 1 of the *Health Standard for the Design of Industrial Enterprises*

Substance	Maximum Allowable Concentration (mg/m^3)	
	Primary	Daily average value
Ammonia	0.20	/
Hydrogen sulfide	0.01	/

Note: momentary maximum allowable concentration refers to the maximum allowable value in the

results of any measurement.

Table 3: Limit on Non - methane Hydrocarbon in Ambient Air

Items	Level-II Standard
Limit on average concentration in 1h (mg/m^3)	2.0

2. Quality Standard for Surface Water Environment

The surface water in project region mainly includes Qingshuihe River and Nanting River, and the water system of project region belongs to Nujiang River water system, and Qingshuihe River refers to a primary tributary on the right bank and downstream side of Nanting River. It is shown from the *Water Environmental Function Zoning for Surface Water of Yunnan Province* (2010-2020) that in regard of Nanting River (Mengding Bridge-national boundary), the main water environmental functions include general fish protection, and surface water belongs to category-III water quality, and category-III water quality standard in the *Environmental Quality Standards for Surface Wate*r (GB 3838-2002) shall be implemented. In the principle of tributary not lower than main stream, Qingshuihe River shall also be subject to category-III standard in the standard. See the table below for standard limits:

Table 4: Environmental Quality Standard for Surface Water Unit: mg/L, pH Dimensionless

Applicable Water Body	Type	pH	BOD_5	COD	NH_3-N	TP	TN	Petroleum
Qingshuihe River and Nanting River	III	6-9	≤4	≤20	≤1.0	≤0.2	≤1.0	≤0.05
Applicable Water Body	Type	Fecal coliform	Sulfide	Volatile phenol				
Qingshuihe River and Nanting River	III	≤10,000 (unit/L)	≤0.2	≤0.005				

3. Quality Standard for Groundwater Environment

The groundwater in project region shall be subject to category-III standard in GB/T 14848-93 *Quality Standard for Ground Water*.

Table 5: Quality Classification Indicators for Groundwater Unit: mg/l

Pollutant Name	pH	Permanganate Index	Chloride	Total Hardness	Cyanide	Arsenic	Lead	Cadmium
Concentration limit in category-III standard	6.5~8.5	≤3	≤250	≤450	≤0.05	≤0.05	≤0.05	≤0.01
Pollutant Name	Sulphate	Volatile phenol	Nitrate	Ammonia nitrogen	Mercury	Cr^{6+}	Fe	Fluoride
Concentration limit in category-III standard	≤250	0.002	≤20	≤0.2	≤0.001	≤0.05	≤0.3	≤1.0
Pollutant Name	Total bacterial count	Total coliform	Manganese	Total dissolved solids	Nitrite			
Concentratio	≤100	≤3 units/L	0.1	1000	0.02			

Pollutant Name	pH	Permanganate Index	Chloride	Total Hardness	Cyanide	Arsenic	Lead	Cadmium
n limit in category-III standard	units/L							

3. Quality Standard for Sound Environment

The Project refers to the project for infrastructure in Qingshuihe River Area of Lincang Border Economic Cooperation Zone, and regional sound environmental function zone of the Project belongs to category-3 zone; the area within 30m from both sides of road boundary line shall be subject to category -4a standard in GB 3096-2008 *Environmental Quality Standards for Noise*; the area 30m from road boundary line shall be subject to category-3 standard in GB 3096-2008 *Environmental Quality Standards for Noise*; residential area shall be subject to category-2 standard, and school and hospital shall be subject to category-1 standard.

Table 6: Quality Standard for Sound Environment Unit: dB (A)

Type	Application Area	Equivalent Sound Level/dB (A)	
		Daytime	Night
Category 3	The area with main functions of industrial production, storage and logistics	≤65	≤55
Category 4a	The area within 30m from both sides of traffic artery	≤70	≤55
Category 2	Residential area	60	50
Category 1	School and hospital	55	45

4. Water loss and Soil Erosion

Assessment standard for water loss and soil erosion shall be subject to the gradation standard for water erosion strength in SL190-2007 *Standards for Classification and Gradation of Soil Erosion*, as shown in Table 7.

Table 7: Gradation Indicators for Water Erosion Strength

Level	Erosion Modulus t/km^2 year
I micro erosion (free of visible erosion)	<500
II slight erosion	500-2500
III medium erosion	2500-5000
IV high erosion	5000-8000
V ultrahigh erosion	8000-15000

II. Pollutant Emission Standard

1. Air Pollutant Emission Standard

(1) Level-II standard in Table 2 of the *Comprehensive Emission Standard of Air Pollutants* (GB 16297-1996) shall be implemented in construction period, with specific contents shown in Table 8.

Table 8: Comprehensive Emission Standard of Air Pollutants Unit: mg/m^3

Pollutant	Construction Contents	Maximum Allowable Emission Concentration	Monitoring Concentration Limit on fugitive Emission
Particulate matter	Subgrade excavation, etc.	——	1.0

(2) Emission standard for exhaust gas from plant area in the operation of sewage treatment plant in Qingshuihe River Port shall be subject to level-II standard in Table 4 of GB 18918-2002 *Discharge*

Standard of Pollutants for Municipal Sewage Treatment Plant.

Table 9: Maximum Allowable Concentration for Exhaust Gas Emission (at the Edge of Protection Zone) Unit mg/m^3

Type	Pollutant	Standard Concentration Limit
Exhaust gas at plant boundary (the edge of protection zone)	Ammonia	1.5
	Hydrogen sulfide	0.06
	Odor concentration (dimensionless)	20
	Methane (maximum volume concentration in plant area)	1

(3) Cooking fume emission from school and hospital canteens in operation period shall be subject to the *Emission Standard of Cooking Fume* (Trial) (GB 18483-2001), with maximum allowable emission concentration and minimum removal efficiency of fume purification facilities shown in Table 10.

Table 10: Emission Standards and Minimum Fume Removal Efficiency for Catering Units

Standard Type	Maximum Allowable Fume Emission Concentration (mg/m^3)	Minimum Removal Efficiency of Purification Facilities (%)	Base Number of Cooking Range (Nr.)
Standard for large-sized cooking range	≤2	≥85	≥6

(4) Non-methane hydrocarbon in fugitive emission in the operation of gas station shall be subject to level-II standard in the *Comprehensive Emission Standard of Air Pollutants* (GB 16297-1996), with standard values as below:

Table 11: Emission Standard for Atmospheric Pollutants in Operation Period

Pollutant	Maximum Monitoring Concentration off Perimeter for Fugitive Emission mg/m^3
Non-methane hydrocarbon	4.0

2. Noise Emission Standard

(1) Noise emission on construction site shall be subject to GB 12523-2011 *Emission Standard of Environment Noise for Boundary of Construction Site*, with standard values shown in Table 12.

Table 12: Emission Limit on Environmental Noise for Boundary of Construction Site Unit: dB(A)

Daytime	Night
70	55

(2) The Project refers to the project for infrastructure in Qingshuihe River Area of Lincang Border Economic Cooperation Zone, and regional sound environmental function zone of the Project belongs to category-3 zone; noise emission for the boundary of basic buildings shall be subject to category-3 standard in GB 12348-2008 *Emission Standard for Industrial Enterprise Noise at Boundary*, with standard values shown in Table 13.

Table 13: Environmental Noise Emission Standard for Industrial Enterprises at Boundary Unit: dB (A)

Type	Daytime	Night
Category 3	65	55

3. Sewage

(1) The Project refers to the project for infrastructure in Qingshuihe River Area of Lincang Border Economic Cooperation Zone, and it is planned to build 1 sewage treatment plant and sewage collection pipe network in Qingshuihe River Area for the treatment of domestic sewage and part of production sewage in the area; the sewage discharged from sewage treatment plant in Qingshuihe River Area shall be subject to level-I standard B in Table 1 of GB 18918-2002 *Discharge Standard of Pollutants for Municipal Sewage Treatment Plant,* with standard values shown in Table 14.

Table 14: Standard in Table 1 of the Discharge Standard of Pollutants for Municipal Sewage Treatment Plant Unit: mg/L

S/N	Basic Control Item		Level-I Standard B
1	Chemical oxygen demand (COD)		60
2	Biochemical oxygen demand (BOD5)		20
3	Suspended solids (SS)		20
4	Animal and vegetable oils		3
5	Petroleum		3
6	Anionic surfactant		1
7	Total nitrogen (measured by N)		20
8	Ammonia-nitrogen (measured by N)		8 (15)
9	Total phosphorus (measured by P)	Plants built before December 31, 2005	1.5
		Plants built from January 1, 2006	1
10	Chroma (dilution ratio)		30
11	pH		6~9
12	Number of fecal coliforms (unit/L)		10^4

Notes:

① Removal rate indicators shall prevail in the following conditions: in case inflow COD is more than 350 mg/L, removal rate shall be more than 60%; in case BOD is more than 160 mg/L, removal rate shall be 50%.

② The value outside the brackets refers to the control indicator with water temperature above 12° C, and the value in the brackets refers to the control indicator with water temperature not higher than 12° C.

(2) The domestic sewage from all the pollutant discharging units in Qingshuihe River Economic Zone will undergo pre-treatment and then discharged into municipal sewage pipe network, and finally led to sewage treatment plant of Qingshuihe River Area for treatment; the sewage discharged into municipal sewage pipe network shall be subject to level (B) standard in Table 1 of the *Sewage Quality Standards for Discharge to Municipal Sewers* (GB/T 31962-2015), with standard limits shown in Table 15. While the hospital in Qingshuihe River Port in the infrastructure project refers to an general hospital with 100 beds, and sewage will undergo pre-treatment before being discharged into municipal sewage pipe network, and will be finally led to sewage treatment plant of Qingshuihe River Area for treatment; sewage discharge shall be subject to pretreatment standard in Table 2 of the *Discharge Standard of Water Pollutants for Medical Organization* (GB 18466-2005), with standard values shown in Table 16.

Table 15: Sewage Quality Standard for Discharge to Municipal Sewers Unit: mg/L

Standard Type	pH	COD (mg/L)	SS (mg/L)	BOD_5 (mg/L)	Animal and Vegetable Oils (mg/L)	NH_3-N (mg/L)	LAS (mg/L)
GB/T 31962-2015	6.5~9.5	500	400	350	100	45	20

Table 16: Discharge Standard of Water Pollutants from Medical Organization (Pretreatment Standard, Daily Average Value)

S/N	Control Item	Concentration	S/N	Control Item	Concentration
1	pH	6~9	11	Total lead (mg/L)	1.0
2	SS (mg/L)	60	12	Total cyanide (mg/L)	0.5
3	COD_{cr} (mg/L)	250	13	Number of fecal coliforms (MPN/L)	500
4	BOD_5 (mg/L)	100	14	Total silver (mg/L)	0.5
5	Ammonia-nitrogen (mg/L)	15	15	Total residual chlorine (mg/L)	0.5
6	Volatile phenol (mg/L)	0.5	16	Anionic surfactant (mg/L)	5
7	Total mercury (mg/l)	0.02	17	Animal and vegetable oil (mg/L)	5
8	Total arsenic (mg/L)	0.5	18	Petroleum (mg/L)	5
9	Hexavalent chromium (mg/L)	0.5	19	Sulfide (mg/L)	1.0
10	Total cadmium (mg/L)	0.1			
Notes: ① Discharge standard for the process control of disinfection with chlorine disinfectant: total residual chlorine of contact tank outlet shall be 3~10mg/L with contact time in disinfection contact tank ≥1h. ② Total mercury therein is subject to the limit in level-B standard in CJ 343-2010 *Sewage Quality Standards for Discharge to Municipal Sewers*.					

4. Solid Wastes

(1) The sludge from sewage treatment plant shall be subject to Table 5 of GB18918-2002 *Discharge Standard of Pollutants for Municipal Sewage Treatment Plant*.

(2) The storage of medical waste from the hospital in Qingshuihe River Port shall be subject to the *Standard for Pollution Control on Hazardous Waste Storage* (GB 18597-2001).

(3) The sludge from sewage treatment station of the hospital in Qingshuihe River Port shall be subject to control and disposal requirements in 4.3 of the *Discharge Standard of Water Pollutants for Medical Organization* (GB 18466-2005): the sludge from sewage treatment station in medical treatment area shall be disposed as hazardous waste; sludge shall meet required emission standard for medical sludge in Table 4 before cleaning, with standard values shown in Table 17.

Table 17: Sludge Control Standard for Medical Organization

Type of Medical Organization	Number of Fecal Coliforms (MPN/g)	Enteropathogenic Bacteria	Enterovirus	Ascaris Egg Death Rate (%)
General medical organization and other hospital	≤100	Prohibited in detection	Prohibited in detection	>95

(4) Household waste shall be subject to the *Standard for Pollution on the Storage and Disposal Site for General Industrial Solid Wastes* GB 18599-2001.

Please develop assessment by the above assessment standards determined.

Lincang Municipal Environmental Protection Bureau

临沧市环境保护局

2012年7月5日

Source of the above Letter is the Domestic EIA document

1.B: EHS Standards as compared to PRC Standards

PRC vs. EHS Assessment Standards

The environmental standard system that supports the implementation of the environmental protection laws and regulations in the PRC can be classified by function-ambient environmental quality standards, and by pollutant emission and/or discharge standards. ADB's SPS requires projects to apply pollution prevention and control technologies and practices consistent with international good practices such as the World Bank Group's Environmental, Health and Safety Guidelines (EHS).[79] For this assessment, where EHS standards exist for parameters and are relevant, they are used in parallel with PRC standards in this assessment.

Evaluation against Ambient Standards

The Lincang Municipal Environmental Protection Bureau has designated the environmental quality classes that apply to each component of the proposed Project (Table 1B.1).

Table 1B.1: Environmental Quality Classes in the Project Area

Variable	Function Classes
Air quality	Class II of GB3095-1996 before 1st January 2016; Class II of GB3095-2012 after 1st January 2016.
Acoustic environment	Class II of GB3096-2008
Surface water quality	Nanting River and Qinshuihe River meet Class III of GB3838-2002.
Groundwater quality	Class III of GB/T 14848-93
Soil quality	Class II of GB15618-1995

Air quality. The PRC ranks air quality into three classes according to *Ambient Air Quality Standard* (GB3095-1996; amended in 2000). Class I is highest air quality and Class III the worst. A new standard was issued in 2012 (GB 3095-2012), replacing GB3095-1996, and will become effective in all municipal level city in 2015 and nation-wide on 1 January 2016. The new standard combines Classes II and III, introduces $PM_{2.5}$ standards, and makes more stringent NO_2 standards. Currently, the applicable standard is GB3095-1996. The World Health Organization (WHO) has set up air quality guideline (AQG) standards for various air quality parameters for the protection of public health. Recognizing that progressive actions are needed to achieve these standards and the financial and technological limitations of some countries or localities especially in developing countries, the WHO also established interim targets as intermediate milestones towards achieving the AQG (Table 1B.2).

Table 1B.2: Comparison of PRC and WBG Ambient Air Quality Standards. n/a=not applicable

Variable	Averaging period	PRC Class I (µg/m3)		PRC Class II (µg/m3)		World Bank Group EHS (µg/m3)	
		GB3095-1996	GB3095-2012	GB3095-1996	GB3095-2012	Interim target	AQG
SO2	1-year	20	20	60	60	n/a	n/a
	24-hour	50	50	150	150	50-125	20
	1-hour	150	150	500	500	n/a	n/a
NO2	1-year	40	40	80	40	n/a	40
	24-hour	80	80	120	80	n/a	n/a
	1-hour	120	120	240	200	n/a	200
CO	24-hour	4,000	4,000	4,000	4,000	n/a	n/a

[79] World Bank Group. 2007. *Environmental, Health and Safety Guidelines General EHS Guidelines.* Washington: World Bank.

Variable	Averaging period	PRC Class I (μg/m3)		PRC Class II (μg/m3)		World Bank Group EHS (μg/m3)	
		GB3095-1996	GB3095-2012	GB3095-1996	GB3095-2012	Interim target	AQG
	1-hour	10,000	10,000	10,000	10,000	n/a	n/a
TSP	1-year	80	80	200	200	n/a	n/a
	24-hour	120	120	300	300	n/a	n/a
PM10	1-year	40	40	100	70	30-70	20
	24-hour	50	50	150	150	75-150	50
PM2.5	1-year		15	N/A	35	15-35	10
	24-hour		35	150	75	37.5-75	25

Acoustic quality. Noise environment for the project's settings will be evaluated against Class II standards of the Ambient Acoustic Quality Standard (GB3096-2008) GB 3096-2008 categorizes five functional areas based on their tolerance to noise pollution: from Category 0 to Category 4. Category 0 is for areas with convalescent facilities that are the least tolerant to noisy environment and therefore has the most stringent day and night time noise standards. Category 1 is for areas predominated by residential areas, hospitals and clinics, educational institutions and research centers. Category 2 is for areas with mixed residential and commercial functions. Category 3 is for areas with industrial production and storage and logistics functions. Category 4 is for regions adjacent to traffic noise sources such as major roads and highways, and is subdivided into 4a and 4b with the former applicable to major road and marine traffic noise and the latter applicable to rail noise. Standards for various functional area categories are compared with the WBG's EHS guidelines in Table 1B.3 showing that the EHS guidelines have lower noise limits for residential, commercial and industrial mixed areas but higher noise limits for industrial areas. The EHS guidelines do not have separate noise limits for trunk roads but apply the same noise limits based on whether the areas are for residential or industrial uses.

Table 1B.3: Environmental Quality Standards for Noise (equivalent sound level LAeq: dB)

Noise Functional Area Category	Applicable Area	GB 3096-2008 Standard		WBG EHS [80] Standards	
		Day 06:00-22:00	Night 22:00-06:00	Day 07:00-22:00	Night 22:00-07:00
0	Areas needing extreme quiet, such as convalescence areas	50	40	55	45
1	Areas mainly for residence, hospitals, cultural and educational institutions, administration offices	55	45		
2	Residential, commercial and industrial mixed areas	60	50		
3	Industrial areas, warehouses and logistic parks	65	55	70	70
4a	Area within 35 m from both sides of expressway, and Class 1 and Class 2 roads	70	55	55	45

Surface water quality. The ambient environmental standard applied in this EIA is Surface Water Ambient Quality Standard (GB3838－2002) Class III for mainstream of Nanting River and Class II for the existing water supply reservoirs (Table 1B.4). Category II is suitable for drinking water sources. Category IV is suitable for general industrial use and non-contact recreational activities.

[80] World Bank Group 2007, Ibid

Category V is the worst which is only suitable for agricultural and scenic water uses. The WBG has guidelines on effluent quality standards but not ambient water quality, and recognizes the use of local ambient water quality criteria for EHS purpose.

Table 1B.4: Surface Water Ambient Quality Standards (Unit: mg/L)

Standard	DO	BOD	COD	NH3-N	pH	TP	TN
(GB3838-2002) – Class II	6	3	15	0.5	6-9	≤0.1	≤0.5
(GB3838-2002) – Class III	≥5	≤4	≤20	≤1.0	6-9	≤0.2	≤1.0
(GB3838-2002) – Class V	≥5	≤10	≤40	≤2.0	6-9	≤0.4	≤2.0

Groundwater quality. According to the survey, there is no exposed spring of underground water in the project area. Therefore, the monitoring to underground water cannot be carried out for environmental impact assessment. No assessment on current status of underground water in this assessment Groundwater quality will be assessed against Class III standards according to Quality Standards for Groundwater (GB/T14848-1993) (Table 1B.5). There are no equivalent EHS targets.

Table 1B.5: Quality Standards for Groundwater

Item	pH	Permanganate	Total	Nitrate Nitrogen	Fluoride	Total E.coli
Class III	6.5-8.5	≤3.0 mg/L	≤450 mg/L	≤20 mg/L	≤1.0 mg/L	≤3.0x103/L

Soil. Soil quality in the PRC is divided into three classes according to the Environmental Quality Standard for Soils (GB 15618-1995). Class I represents the best and Class III the worst. Class II is applicable for the proposed project area (Table 1B.6).

Table 1B.6: Environmental Quality Standard for Soils (Class II)

Parameter	Maximum Allowable Concentration (mg/kg dry weight)		
pH	<6.5	6.5-7.5	>7.5
Cadmium (Cd)	0.30	0.30	0.60
Mercury (Hg)	0.30	0.50	1.0
Arsenic (As) paddy / dry land	30 / 40	25 / 30	20 / 25
Copper (Cu) farmland / orchard	50 / 150	100 / 200	100 / 200
Lead (Pb)	250	300	350
Chromium (Cr) paddy / Dry land	250 / 150	300 / 200	350 / 250
Zinc (Zn)	200	250	300
Nickel (Ni)	40	50	60

2. Emission Standards for Construction and Operation Activities

Air quality. Fugitive emission of particulate matter (such as dust from construction sites) is regulated under PRC's Air Pollutant Integrated Emission Standard (GB 16297-1996), which sets 120 mg/m^3 as the maximum allowable emission concentration and ≤1.0 mg/m^3 as the concentration limit at the boundary of construction sites, with no specification on the particle diameter. Odor from the wastewater treatment stations and solid waste transfer stations should follow the Malodorous Pollutant Emission Standard (GB 14554-93). The maximum allowable concentrations at the boundary of the sites for NH_3, H_2S and odor are 1.5 mg/m^3, 0.06 mg/m^3, and "20" (dimensionless). There are no equivalent EHS targets.

Wastewater. Discharge of wastewater from construction sites is regulated under PRC's Integrated Wastewater Discharge Standard (GB 8978-1996). Class I standards apply to discharges into Category III water bodies under GB 3838-2002. Class II standards apply to discharges into Categories IV and V water bodies. Class III standards apply to discharges into municipal sewers going to municipal WWTPs with secondary treatment. Wastewater generated during construction will be discharged into Category III and V water body. Class I and Class II of GB 8978-1996 applies for construction sites under this project (Table 1B.7).

Table 1B.7: Integrated Wastewater Discharge

Parameter	Class I	Class II	Class III
	For discharge into Category III water body	For discharge into Category IV and V water bodies	For discharge into municipal sewer
pH	6–9	6–9	6–9
SS mg/L	70	150	400
BOD5 mg/L	20	30	300
COD mg/L	100	150	500
TPH mg/L	5	10	20
Volatile phenol mg/L	0.5	0.5	2.0
NH3-N mg/L	15	25	---
PO42- (as P) mg/L	0.5	1.0	---
LAS (= anionic surfactant) mg/L	5.0	10	20

The proposed WWTP in LBECZ District designed based on Class 1A of Urban Sewage Treatment Plant Pollutant Discharge Standards (GB18918-2002) (Table 1B.8). The reuse of treated effluent shall satisfy *The Reuse of Urban Recycling Water: Water Quality Standard for Urban Miscellaneous Water Consumption (GB/T 18920-2002)* for urban landscaping irrigation. *The Reuse of Urban Recycling Water: Water Quality Standard for Green Space Irrigation (GN/T-25499-2010)*.

Table 1B.8: Comparison of Urban Sewage Treatment Plant Pollutant Discharge Standards and Reuse Standard

Parameter	Unit	GB18918-2002 Class 1A	GB/T 18920-2002	GB/T 25499-2010	World Bank EHS Guideline (indicative Values for Treated Sanitary Sewage Discharges[a)]
pH					6-9
COD	mg/L	50	-	-	150
BOD5	mg/L	10	10	20	30
SS	mg/L	10	-	-	50
Turbidity	NTU	-	-	≤5 (not restricted green space; ≤10 (restricted green space)	
Ammonia	mg/L	5(8)	10	20	
TN	mg/L	15	-	-	10
TP	mg/L	0.5	-	-	2
Petroleum	mg/L	1	-	-	10
Total Chlorine Residue	v	-	-	0,2≤end of pipe network≤20	
LAS	mg/L	-	-	1.0	
Fecal coliform	CFU/L	-	-	≤ 200 (not restricted green space; ≤1,000(restricted green space)	400 MPN[b]/L
Ascaris eggs	Eggs/L	-	-	≤1 (Non-restricted green space), ≤2 (restricted green space)	

[a] Not applicable to centralized, municipal, wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation.[b] MPN = Most Probable Number

Most of the parameters that meet Class 1A effluent wastewater quality will also meet the quality standard for reclaimed water for green space irrigation, except for levels of total coliform and

Ascaris eggs.

The medical wastewater, office sewage, canteen sewage and domestic sewage generated, after treated by oil separation tank and septic tank, is to be discharged into the medical wastewater treatment station for treatment. When it meets the pretreatment standard stated in Table 2 of *Discharge Standard of Water Pollutants for Medical Organization* (GB18466-2005), it is to be discharged into municipal sewage pipe network, and ultimately into the sewage treatment plant of Qingshuihe River Area for further treatment. (Table 1B.9)

Table 1B.9: Discharge Standards of water pollutants for Medical Organisation

Calculation Indexes	COD	BOD_5	NH_3-N	SS	TP	Animal and Vegetable Oils
in line with limit stated in Table 2 of *Discharge Standard of Water Pollutants for Medical Organization* (GB18466-2005)	60	20	15	20	-	5

Sludge disposal. The quality of sludge going to landfill disposal should meet the Standard for Pollution Control on the Landfill Site of Municipal Solid Waste (GB 16889-2008). This requires the water content of sludge not to exceed 60%, and meet standards for reuse including as soil conditioner (GB15618-1995), afforestation in gardens and windbreak plantation (GB23468-2009), fertilizer for agricultural use (GB4284-84), land improvement (CJ/T 291-2008), brick building (CJ/T 289-2008) and other land applications. There are no equivalent EHS targets (each country having its own sludge disposal and reuse quality standard).

Noise. Construction noise will be assessed against the PRC Emission Standards of Ambient Noise for Boundary of Site Noise (GB 12523-2011) and Class II of Emission Standard for Industrial Enterprises Noise at Boundary (GB 12348-2008) (Table 1B.10).

Table 1B.10: Construction Site Noise Limits. Unit: Leq [dB (A)]

Period	**Major Noise Source**	**Noise Limit**	
		Day	**Night**
Construction	Bulldozer, excavators and loader; pile driving machines; concrete mixer, vibrator and electric saw; hoist and lifter	70	55
Operation	Pumps	60	50

Vibration. Construction activities will cause vibration impact, and should comply with the Standard for Urban Area Environmental Vibration (GB10070-88) (Table 1B.11).

Table 1B.10: Vertical Vibration Standard Value for Various Urban Areas (Unit: dB)

Scope of applicable area	**Day**	**Night**
Special residential area	65	65
Residential, cultural and educational area	70	67
Mixed area and commercial center	75	72
Industrial centralized area	75	72
Both sides of traffic trunk line	75	72
Both sides of railway main line	80	80

Annexure 2: Baseline Environment Test Reports

Original

Test Report

HCHJZ (2017) No. 245

Description:	Environmental Situation Monitoring on Comprehensive Development Project of Infrastructure in Lincang Border Economic Cooperation Zone
Entrusting Party:	Management Committee of Lincang Border Economic Cooperation Zone
Test Type:	Authorized Monitoring

云南浩辰环保科技有限公司

Yunnan Haochen Environmental Protection Technology Co., Ltd.

June 8, 2017

Original

Statement

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Note: This testing report is explained by Xie Lihao, the technical director of the company, and Chen Meiqiong, the quality director of the company.

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Inspection and Testing Agency

Qualification Certificate

Certificate No.: 162512340047

Name: Yunnan Haochen Environmental Protection Technology Co., Ltd.

Address: Jincheng Base of Industrial Park, Jinning County, Kunming City, Yunnan Province (650605)

This Certificate is hereby issued to prove that through examination, your organization has possessed the basic conditions and ability specified in relevant national laws and administrative rules as well as regulations, so it is hereby approved for issuing data and results functioning as proof to the society. The qualification includes measurement and authentication by the inspection and testing agency.

See the schedule of the certificate for inspection and testing capacity and the authorized signer.

Your legal responsibilities on issuing the inspection and testing report or certificate will be undertaken by **Yunnan Haochen Environmental Protection Technology Co., Ltd.**

Licensed Use Mark

CMA
162512340047

Issued on: June 30, 2016
Date of expiry June 29, 2022
Issuing authority:

This Certificate shall be prepared by Certification and Accreditation Administration of the People's Republic of China and be valid within the territory of the People's Republic of China.

Document of Yunnan Provincial Environmental Protection Bureau

YHT [2016] No. 73

Notification on Qualification Result of the Third Batch of Social Environmental Monitoring Agencies by Provincial Environmental Protection Bureau

To all environmental protection bureaus in all prefectures (cities), all social environmental monitoring agencies and relevant authorities:

Based on the Regulations on Qualification and Management of Social Environmental Monitoring Agencies in Yunnan Province (Tentative) (YHT [2012] No. 103, hereinafter referred to as the "Regulations") and relevant documents, Our Bureau has reviewed relevant agencies which apply for qualification of social environmental agencies in Yunnan Province. Now, we publish the qualification results and relevant matters as below:

I. Qualification Results

Based on review on work licenses of monitoring personnel, assessment on blind samples, comprehensive skill assessment and site evaluation for those social environmental monitoring agencies which apply for qualification, we decide the following issues after study (listed not by rank):

(I) Eleven agencies are recognized as Class B social environmental monitoring qualification, including Yunnan Provincial Geology and Mineral Environmental Monitoring Center, Yunnan Yaming Environmental Monitoring Technology Co., Ltd., Yunnan Haochen Environmental Protection Technology Co., Ltd., Yunnan Tianlai Environmental Protection Technology Co., Ltd., Diqing Shanshui Environmental Protection Technology Co., Ltd., Yunnan Science Research Institute of Communication & Transportation (Yunnan Environmental Monitoring Center of Communication & Transportation), Yunnan Suyuan Environmental Technology Co., Ltd., Yunnan Shengqing Environmental Monitoring Technology Co., Ltd., Yunnan Jingke Environmental Monitoring Co., Ltd. Kunming Ronghua Environmental Technology Co., Ltd. and Kunming Metallurgical Research Institute (Yunnan Metallurgical Environmental Monitoring Center);

(II) Baoshan Puli Analysis and Testing Co., Ltd. is recognized as Class D social environmental monitoring qualification;

(III) Yunnan Anyi Safety Evaluation Company and Honghe Lvdun Environmental Monitoring Co., Ltd. will be recognized after they supplement and improve relevant matters and Our Bureau reviews and confirms that they satisfy qualification requirements;

(IV) The qualification of Disease Prevention and Control Center of Kunming Railway Administration (Environmental Monitoring Station of Kunming Railway Administration) is not recognized.

II. Relevant Description

(I) We will not print and issue qualification certificates for those social environmental monitoring agencies whose qualification is recognized. Name, service level and licensed environmental monitoring services of agencies shall be in accordance with the information published on the official website of Yunnan Provincial Environmental Protection Bureau (**http ://www.ynepb.gov.cn/**)

(II) The qualification is valid in three years, from the issuing date of this document.

III. Working Requirements

(I) All social environmental monitoring agencies shall comply with relevant laws, regulations and specifications, enhance their monitoring quality management, and improve monitoring technology level continuously. They shall not do any illegal acts and violations, including fraud and data manipulation. Any such acts (if any) shall be disposed based on the Regulations on Judgment and Disposal of Fraud on Environmental Monitoring Data (HF [2015], No. 175) and other regulations.

(II) All environmental protection bureaus of all prefectures (cities) shall perform daily supervision duties, and supervise and manage the social environmental monitoring agencies under their jurisdiction on daily basis. Furthermore, they shall not set any local threshold.

Provincial Environmental Protection Bureau

April 19, 2016

1. Sample Condition Schedules

Table 1-1 Basic Information of Samples

Sampling location and number	Ambient air	Mengding Town (HQ01), Qingshuihe River Port (HQ02), Shuanglongjing (HQ03), Banxing (HQ04), Qingshu Village (HQ05), and Dawan River (HQ06).			
	Surface water	500m upstream of Nanting River from Nanting River Bridge (DB01), 1500m downstream of Nanting River from Nanting River Bridge (DB02), 500m upstream of Qingshuihe River (DB03), 500m downstream of Qingshuihe River (DB04), 500m upstream of Nanting River from the junction of Qingshuihe River and Nanting River (DB05), 50m downstream of Nanting River from the junction of Qingshuihe River and Nanting River (DB06),			
	Noise	Mengding Town (ZS01), Qingshuihe River Port (ZS02), Guomen Primary School (ZS03), Shuanglongjing (ZS04), Qingshuzhai (ZS05), Bangui (ZS06), Dawantang (ZS07), Banxing Village (ZS08), Banxing (ZS09), Tuanjie Village (ZS10), Dawan River (ZS11), Proposed Hospital Site (ZS12).			
Sampling method and storage method	Ambient air	Total suspended particulates (TSP): sampling method with filter, storing samples in paper bags at normal temperature. Inhalable particle: sampling method with filter, storing samples in sealed bags. Sulfur dioxide, nitrogen oxides, hydrogen sulfide, ammonia: sampling method by porous glass tube solution absorption sampler, storing samples at low temperature. Carbon monoxide: direct measurement by instruments.			
	Surface water	Sampling method: drawing instantaneous water samples pH, suspended matters: store them in plastic bottles at low temperature, without any fixing agent. Chemical oxygen demand (cod), total nitrogen, ammonia nitrogen, total phosphorus: store them in plastic bottles, with sulfuric acid until pH < 2, at normal temperature. Biochemical oxygen demand (BOD) for five days: use dissolved oxygen bottles for drawing, and store it at low temperature. Petroleum: store them in glass bottle, add HCl until pH < 2, and store them at normal temperature. Fecal coliform: collect samples in sterilized bottles, and store them in clod at low temperature Volatile phenol: collect samples in brown glass bottles, sampling, add 10ml H_3PO_4 ascorbic acid, store them at low temperature without light. Sulfide: collect samples in plastic bottles, add 10ml zinc acetate sodium acetate solution/1L water sample, and then add 10mlNaOH, and store them at normal temperature.			
	Noise	Equivalent continuous A-weighted level: test it at site.			
Sampling frequency	Ambient air	Mengding Town (HQ01)	7-day continuous monitoring, calculation of daily mean values of TSP and PM_{10}, and hour values and daily mean values of SO_2 and NO_X.	Sample quantity	6 sets, 560 samples
		Qingshuihe River Port (HQ02)	7-day continuous monitoring, calculation of daily mean values of TSP and PM_{10}, and hour values and daily mean values of $SO_2$and NO $_X$, hour value and daily mean value of CO, minimum values of ammonia and hydrogen sulfide.		

		Shuanglongjing (HQ03), Banxing (HQ04), Qingshu Village (HQ05), and Dawan River (HQ06).	7-day continuous monitoring, calculation of daily mean values of TSP and PM_{10}, and hour values and daily mean values of SO_2 and NO_X, hour value and daily mean value of CO.		
	Surface water	3-day continuous monitoring, 1 mixed sample every day.			7 sets, 126 samples
	Noise	2-day continuous monitoring, once in daytime, and once at night every day.			/
Condition description	Ambient air	Filter membrane is free of damages, and absorption liquid volume is normal.			
	Surface water	The water samples are a bit muddy, with intact labels.			
Sample collector	Liu Kegang, Fu Jinxiang, Guo Yujun, Wang Fajie, Wu Huaifang, Chen Zhen		Sampling Date	05/24/2017-05/30/2017	
Sample sender	Fu Jinxiang		Sample Receiving Date	5/31/2017	
Sample receiver	Zhou Li		Test Date	05/31/2017.-06/05/2017.	

2. Test Environment

Indoor testing environment: temperature 22.4 ℃-25.0℃, air pressure 79.9kPa-80.4kPa, relative humidity 35%-54%.

3. Detecting Items, Detection Methods, Equipment and Personnel

Table 3-1 List of Detecting Items, Detection Methods, Equipment and Personnel

Inspection Items	Detection Methods/Standard No.	Limit of Detection	Detection Equipment		Examined by
			Equipment Type and Name	Equipment No.	
Total suspended particulates	Ambient Air - Determination of Total Suspended Particulates - Gravimetric Method GB/T15432-1995	0.001 (mg/m^3)	AR224CN Electronic balance	HC/JY-03	Hu Qian
Inhalable particle	Determination of PM_{10} and $PM_{2.5}$in Ambient Air - Gravimetric Method HJ618-2011	0.010 (mg/m^3)	AR224CN Electronic balance	HC/JY-03	Hu Qian
Oxynitride	Air and Exhaust Gas - Determination of Nitrogen Oxides (Nitric Oxide and Nitrogen Dioxide) - N(1-naphty1)-Ethylenediamine Dihydrochloride Spectrophotometric Method HJ 479-2009	Daily average value 0.003 Hourly value 0.005 （mg/m^3）	Type 722S visible spectrophotometer	HC/JY-08	Ni Yan
Sulfur Dioxide	Air and Exhaust Gas - Determination of Sulfur Dioxide - Formaldehyde Absorption - Pararosaniline Spectrophotometric Method HJ 482-2009	Daily average value 0.004 Hourly value 0.007 （mg/m^3）	Type 722S spectrophotometer	HC/JY-08	Luo Deying
Hydrogen sulfide	Air and Exhaust Gas - Determination of Hydrogen	0.001 (mg/m^3)	Type 722S visible spectrophotometer	HC/JY-08	Hu Qian

	Sulfide - Methylene Blue Spectrophotometric Method – *Analytical Method for Ambient Air and Exhaust* Gas (Fourth Edition)				
Ammonia	Air and Exhaust Gas - Determination of Ammonia - Nessler's Reagent Spetcrophotometry HJ533-2009	Ambient air: 0.01 Exhaust gas 0.25 (mg/m^3)	Type 722S visible spectrophotometer	HC/JY-08	Gu Siwei
Carbon monoxide	Air Quality - Determination of Carbon Monoxide - Non-disperisive Infrared Spectrometry GB9801-88	0.3mg/m^3	GXH-3011AL infrared gas analyzer	HC/JY-27	Fu Jinxiang Wang Fajie
Suspended matter:	Water Quality – Determination of Suspended Particulates - Gravimetric Method GB11901-89	/	AR224CN electronic balance	HC/JY-03	Luo Deying
Chemical oxygen demand	Water Quality – Determination of Chemical Oxygen Demand - Potassium Dichromate Method GB11914-89	10mg/L	50ml burette	X-1	Luo Deying
Five-day BOD	Water Quality – Determination of Five-day BOD (BOD5) - Dilution and Inoculation Method HJ505-2009	0.5mg/L	50ml burette	X-1	Luo Deying
pH	Water Quality – Determination of pH Value - Glass Electrode Method GB6920-86	/	PHS-3H pH meter	HC/JY-11	Gu Siwei
Petroleum	Water Quality – Determination of Petroleum Oils and Animal and Vegetable Oils - Infrared Spectrophotometry HJ 637-2012	0.01 mg/L	OIL-480 infrared oil content analyzer	HC/JY-13	Hu Qian
Total phosphorus	Water Quality-Determination of Total Phosphorus - Ammonium Molybdate Spectrophotometric Method GB11893-89	0.01 mg/L	Type 722S visible spectrophotometer	HC/JY-09	Gu Siwei
Ammonia nitrogen	Water Quality - Determination of Ammonia Nitrogen - Nessler's Reagent Spetcrophotometry HJ535-2009	0.025 mg/L	Type 722S visible spectrophotometer	HC/JY-08	Gu Siwei
Total nitrogen	Water Quality - Determination of Total Nitrogen - Alkaline Potassium Persulfate Digestion UV Spectrophotometry HJ636-2012	0.05 mg/L	T6 new century type UV spectrophotometer	HC/JY-06	Gu Siwei
Sulfide	Water Quality - Determination of Sulfide - Methylene Blue Spectrophotometric Method GB/T16489-96	0.005 mg/L	Type 722S spectrophotometer	HC/JY-08	Hu Qian
Volatile phenol	Water Quality - Determination of Volatile Phenolic Compounds - 4-AAP Spectrophotometric Method HJ 503-2009	$3x10^{-4}$ mg/L	Type 722S visible spectrophotometer	HC/JY-08	Luo Deying

Fecal coliforms	Water Quality - Determination of Fecal Coliform - Manifold Zymotechnics and Filter Membrane (Trial) HJ/T 347-2007	/.	HPX-9082MBE electro-heating standing-temperature cultivator	HC/FZ-09	Luo Deying
Environmental noise	Environmental Quality Standard for Noise GB/3096-2008	30.0dB	AWA6228 sound level meter	HC/JY-28	Fu Jinxiang

4. Detection Results

Table 4-1 List of Surface Water Detection Results

Sample Type	Analysis Item	Date	At the Bridge of 500m Upstream Nanting River（DB01）	At the Bridge of 1500m Downstream Nanting River（DB02）	500m Upstream Qingshuihe River (DB03)	Unit
Surface water	pH	5/27/2017	6.67	6.69	7.52	/
		5/28/2017	6.98	7.11	7.94	/
		5/29/2017	6.83	6.84	7.66	/
	Chemical oxygen demand	5/27/2017	15	13	16	mg/L
		5/28/2017	14	14	15	mg/L
		5/29/2017	12	14	13	mg/L
	Five-day BOD	5/27/2017	2.1	2.2	2.7	mg/L
		5/28/2017	2.6	2.5	2.5	mg/L
		5/29/2017	2.4	2.6	2.4	mg/L
	Total nitrogen	5/27/2017	0.76	0.72	0.68	mg/L
		5/28/2017	0.63	0.68	0.71	mg/L
		5/29/2017	0.74	0.64	0.63	mg/L
	Ammonia nitrogen	5/27/2017	0.307	0.345	0.318	mg/L
		5/28/2017	0.275	0.185	0.387	mg/L
		5/29/2017	0.238	0.259	0.419	mg/L
	Total phosphorus	5/27/2017	0.09	0.10	0.097	mg/L
		5/28/2017	0.10	0.15	0.12	mg/L
		5/29/2017	0.08	0.11	0.14	mg/L
	Petroleum	5/27/2017	0.03	0.03	0.04	mg/L
		5/28/2017	0.03	0.02	0.04	mg/L
		5/29/2017	0.02	0.02	0.04	mg/L
	Suspended matter	5/27/2017	121	138	14	mg/L
		5/28/2017	111	132	20	mg/L
		5/29/2017	113	144	23	mg/L
	Sulfide	5/27/2017	0.005L	0.005L	0.005L	mg/L
		5/28/2017	0.005L	0.005L	0.005L	mg/L
		5/29/2017	0.005L	0.005L	0.005L	mg/L
	Volatile phenol	5/27/2017	3×10^{-4}L	3×10^{-4}L	3×10^{-4}L	mg/L
		5/28/2017	3×10^{-4}L	3×10^{-4}L	3×10^{-4}L	mg/L
		5/29/2017	3×10^{-4}L	3×10^{-4}L	3×10^{-4}L	mg/L
	Fecal coliforms	5/27/2017	<2	<2	<2	Nr./L
		5/28/2017	<2	<2	<2	Nr./L
		5/29/2017	<2	<2	<2	Nr./L

Table 4-1 List of Surface Water Detection Results (Continued)

Sample Type	Analysis Item	Date	500m Downstream Qingshuihe River (DB04)	At the Confluence Reaches of Qingshuihe River and Nanting River 500m Upstream Nanting River (DB05)	At the Confluence Reaches of Qingshuihe River and Nanting River 50m Downstream Nanting River (DB06)	Unit
Surface water	pH	5/27/2017	8.13	7.46	7.62	/
		5/28/2017	8.19	7.48	7.58	/
		5/29/2017	8.14	7.51	7.64	/
	Chemical oxygen demand	5/27/2017	17	15	16	mg/L
		5/28/2017	16	14	13	mg/L
		5/29/2017	15	13	14	mg/L
	Five-day BOD	5/27/2017	2.8	2.4	2.5	mg/L
		5/28/2017	2.6	2.3	2.3	mg/L
		5/29/2017	2.5	2.2	2.4	mg/L
	Total nitrogen	5/27/2017	0.83	0.76	0.60	mg/L
		5/28/2017	0.76	0.73	0.63	mg/L
		5/29/2017	0.80	0.74	0.61	mg/L
	Ammonia nitrogen	5/27/2017	0.233	0.233	0.339	mg/L
		5/28/2017	0.291	0.281	0.371	mg/L
		5/29/2017	0.259	0.217	0.323	mg/L
	Total phosphorus	5/27/2017	0.08	0.09	0.10	mg/L
		5/28/2017	0.04	0.08	0.14	mg/L
		5/29/2017	0.06	0.09	0.11	mg/L
	Petroleum	5/27/2017	0.04	0.03	0.02	mg/L
		5/28/2017	0.04	0.03	0.02	mg/L
		5/29/2017	0.04	0.03	0.01	mg/L
	Suspended matter	5/27/2017	6	119	135	mg/L
		5/28/2017	10	122	142	mg/L
		5/29/2017	14	129	145	mg/L
	Sulfide	5/27/2017	0.005L	0.005L	0.005L	mg/L
		5/28/2017	0.005L	0.005L	0.005L	mg/L
		5/29/2017	0.005L	0.005L	0.005L	mg/L
	Volatile phenol	5/27/2017	3 X 10^{-4}L	3 X 10^{-4}L	3 X 10^{-4}L	mg/L
		5/28/2017	3 X 10^{-4}L	3 X 10^{-4}L	3 X 10^{-4}L	mg/L
		5/29/2017	3 X 10^{-4}L	3 X 10^{-4}L	3 X 10^{-4}L	mg/L
	Fecal coliforms	5/27/2017	<2	<2	<2	Nr./L
		5/28/2017	<2	<2	<2	Nr./L
		5/29/2017	<2	<2	<2	Nr./L

Table 4-2 List of Ambient Air Detection Results Unit (mg/m^3)

Analysis Item	Date	Mengding Town (HQ01)	Port of Qingshuihe River (HQ02)	Shuanglongjing Village (HQ03)	Banxing Village (HQ04)	Qingshu Village (HQ05)	Dawanjiang Village (HQ06)
Total suspended particulates	5/24/2017	0.127	0.097	0.095	0.089	0.096	0.080
	5/25/2017	0.115	0.089	0.098	0.106	0.106	0.100
	5/26/2017	0.122	0.086	0.118	0.096	0.107	0.090

Analysis Item	Date	Mengding Town (HQ01)	Port of Qingshuihe River (HQ02)	Shuanglongjing Village (HQ03)	Banxing Village (HQ04)	Qingshu Village (HQ05)	Dawanjiang Village (HQ06)
	5/27/2017	0.113	0.098	0.120	0.108	0.105	0.093
	5/28/2017	0.117	0.118	0.105	0.099	0.125	0.096
	5/29/2017	0.129	0.113	0.094	0.103	0.098	0.087
	5/30/2017	0.155	0.097	0.118	0.111	0.099	0.093
Inhalable particle	5/24/2017	0.094	0.067	0.076	0.052	0.071	0.055
	5/25/2017	0.084	0.061	0.077	0.062	0.086	0.068
	5/26/2017	0.090	0.064	0.086	0.067	0.068	0.056
	5/27/2017	0.080	0.070	0.087	0.068	0.067	0.055
	5/28/2017	0.091	0.083	0.082	0.059	0.077	0.056
	5/29/2017	0.097	0.080	0.074	0.065	0.070	0.046
	5/30/2017	0.101	0.065	0.087	0.070	0.068	0.047
Oxynitride	5/24/2017	0.032	0.027	0.032	0.038	0.034	0.031
	5/25/2017	0.026	0.032	0.026	0.040	0.026	0.033
	5/26/2017	0.025	0.038	0.033	0.025	0.033	0.034
	5/27/2017	0.030	0.037	0.036	0.033	0.038	0.032
	5/28/2017	0.032	0.028	0.025	0.034	0.036	0.028
	5/29/2017	0.036	0.036	0.035	0.040	0.040	0.027
	5/30/2017	0.035	0.034	0.028	0.037	0.027	0.036
Sulfur Dioxide	5/24/2017	0.018	0.017	0.018	0.018	0.018	0.018
	5/25/2017	0.020	0.020	0.019	0.020	0.020	0.020
	5/26/2017	0.017	0.019	0.020	0.019	0.019	0.019
	5/27/2017	0.019	0.018	0.019	0.018	0.018	0.017
	5/28/2017	0.018	0.017	0.018	0.019	0.018	0.018
	5/29/2017	0.017	0.019	0.017	0.017	0.017	0.017
	5/30/2017	0.018	0.017	0.018	0.017	0.018	0.018

Table 4-2 List of Ambient Air Detection Results (Continued) Unit (mg/m^3)

Analysis Item	Date	Port of Qingshuihe River (HQ02)	Shuanglongjing Village (HQ03)	Banxing Village (HQ04)	Qingshu Village (HQ05)	Dawanjiang Village (HQ06)
Carbon monoxide	5/24/2017	0.9	0.5	0.6	0.7	0.4
	5/25/2017	0.9	0.6	0.5	0.6	0.5
	5/26/2017	1.0	0.5	0.6	0.8	0.3
	5/27/2017	0.9	0.5	0.7	0.6	0.4
	5/28/2017	1.0	0.4	0.4	0.7	0.4
	5/29/2017	0.8	0.5	0.6	0.7	0.4
	5/30/2017	1.1	0.6	0.5	0.6	0.6

Table 4-2 List of Ambient Air Detection Results (Continued) Unit (mg/m^3)

Monitoring Point	Date	Analysis Item							
		Ammonia				Hydrogen sulfide			
Port of Qingshuihe River (HQ02)	Time Window	02:00	08:00	14:00	20:00	02:00	08:00	14:00	20:00
	5/24/2017	0.02	0.02	0.03	0.02	0.004	0.005	0.009	0.005
	5/25/2017	0.02	0.03	0.03	0.02	0.004	0.005	0.007	0.005
	5/26/2017	0.02	0.02	0.03	0.02	0.004	0.004	0.006	0.004
	5/27/2017	0.02	0.03	0.04	0.02	0.003	0.004	0.004	0.003

	5/28/2017	0.02	0.03	0.03	0.02	0.004	0.004	0.006	0.004
	5/29/2017	0.02	0.04	0.04	0.03	0.003	0.003	0.007	0.004
	5/30/2017	0.03	0.04	0.04	0.03	0.005	0.003	0.006	0.003

Table 4-2 List of Ambient Air Detection Results (Continued) Unit (mg/m^3)

Analysis Item	Date	Time Window	Mengding Town (HQ01)	Port of Qingshuihe River (HQ02)	Shuanglongjing Village (HQ03)	Banxing Village (HQ04)	Qingshu Village (HQ05)	Dawanjiang Village (HQ06)
Sulfur dioxide	5/24/2017	02:00	0.023	0.026	0.022	0.023	0.025	0.025
		08:00	0.017	0.017	0.021	0.020	0.020	0.020
		14:00	0.015	0.015	0.017	0.017	0.018	0.018
		20:00	0.014	0.012	0.016	0.016	0.014	0.016
	5/25/2017	02:00	0.025	0.022	0.024	0.023	0.023	0.022
		08:00	0.020	0.020	0.018	0.020	0.021	0.021
		14:00	0.015	0.017	0.014	0.018	0.015	0.015
		20:00	0.016	0.014	0.015	0.016	0.018	0.017
	5/26/2017	02:00	0.023	0.025	0.022	0.024	0.025	0.025
		08:00	0.019	0.020	0.019	0.018	0.015	0.015
		14:00	0.017	0.017	0.017	0.017	0.017	0.017
		20:00	0.012	0.015	0.015	0.016	0.014	0.014
	5/27/2017	02:00	0.022	0.023	0.025	0.023	0.024	0.023
		08:00	0.020	0.020	0.020	0.022	0.018	0.017
		14:00	0.018	0.015	0.018	0.018	0.017	0.017
		20:00	0.013	0.017	0.015	0.016	0.016	0.016
	5/28/2017	02:00	0.025	0.025	0.022	0.023	0.023	0.022
		08:00	0.020	0.019	0.017	0.020	0.020	0.020
		14:00	0.016	0.015	0.017	0.018	0.014	0.015
		20:00	0.019	0.014	0.014	0.016	0.019	0.019
	5/29/2017	02:00	0.022	0.025	0.022	0.023	0.022	0.022
		08:00	0.020	0.019	0.018	0.020	0.020	0.020
		14:00	0.018	0.018	0.017	0.016	0.014	0.015
		20:00	0.015	0.016	0.016	0.019	0.019	0.019
	5/30/2017	02:00	0.025	0.023	0.022	0.025	0.025	0.025
		08:00	0.020	0.016	0.019	0.020	0.019	0.019
		14:00	0.018	0.015	0.017	0.017	0.014	0.016
		20:00	0.016	0.016	0.014	0.014	0.018	0.020

Table 4-2 List of Ambient Air Detection Results (Continued) Unit (mg/m^3)

Analysis Item	Date	Time Window	Mengding Town (HQ01)	Port of Qingshuihe River (HQ02)	Shuanglongjing Village (HQ03)	Banxing Village (HQ04)	Qingshu Village (HQ05)	Dawanjiang Village (HQ06)
Oxynitride	5/24/2017	02:00	0.024	0.026	0.031	0.022	0.021	0.027
		08:00	0.035	0.036	0.036	0.027	0.033	0.036
		14:00	0.026	0.029	0.032	0.035	0.034	0.032
		20:00	0.023	0.025	0.030	0.024	0.029	0.027
	5/25/2017	02:00	0.023	0.027	0.030	0.023	0.024	0.028
		08:00	0.035	0.036	0.034	0.037	0.035	0.040
		14:00	0.030	0.033	0.034	0.038	0.039	0.035
		20:00	0.025	0.027	0.029	0.031	0.030	0.028
	5/26/2017	02:00	0.027	0.028	0.029	0.028	0.025	0.032
		08:00	0.036	0.038	0.038	0.039	0.039	0.044
		14:00	0.032	0.036	0.035	0.041	0.043	0.037
		20:00	0.028	0.029	0.029	0.035	0.033	0.032
	5/27/2017	02:00	0.024	0.033	0.028	0.027	0.029	0.027
		08:00	0.035	0.039	0.036	0.038	0.041	0.038
		14:00	0.026	0.038	0.033	0.044	0.036	0.031
		20:00	0.023	0.033	0.028	0.034	0.023	0.026
	5/28/2017	02:00	0.023	0.028	0.024	0.024	0.023	0.026
		08:00	0.034	0.038	0.029	0.036	0.032	0.038
		14:00	0.031	0.033	0.030	0.039	0.037	0.031
		20:00	0.025	0.027	0.026	0.023	0.028	0.027
	5/29/2017	02:00	0.031	0.027	0.035	0.024	0.024	0.031
		08:00	0.040	0.039	0.042	0.029	0.035	0.040
		14:00	0.035	0.032	0.038	0.035	0.040	0.036
		20:00	0.028	0.028	0.034	0.024	0.033	0.029
	5/30/2017	02:00	0.028	0.031	0.031	0.024	0.027	0.027
		08:00	0.038	0.038	0.039	0.032	0.042	0.037
		14:00	0.030	0.037	0.034	0.034	0.043	0.045
		20:00	0.025	0.030	0.030	0.025	0.034	0.026

Table 4-2 List of Ambient Air Detection Results (Continued) Unit (mg/m^3)

Analysis Item	Date	Time Window	Port of Qingshuihe River (HQ02)	Shuanglongjing (HQ03)	Banxing (HQ04)	Qingshu Village (HQ05)	Dawanjiang (HQ06)
Carbon monoxide	5/24/2017	02:00	0.6	0.5	0.6	0.7	0.4
		08:00	0.9	0.6	0.5	0.6	0.5
		14:00	1.2	0.7	0.8	0.8	0.7
		20:00	0.9	0.5	0.7	0.6	0.4
	5/25/2017	02:00	0.7	0.4	0.4	0.7	0.4
		08:00	0.8	0.5	0.6	0.7	0.4
		14:00	1.1	0.6	0.7	1.0	0.8
		20:00	0.9	0.5	0.6	0.7	0.4
	5/26/2017	02:00	0.5	0.6	0.5	0.6	0.5
		08:00	0.9	0.5	0.6	0.8	0.3
		14:00	1.3	0.7	0.7	1.1	0.8
		20:00	0.8	0.4	0.4	0.7	0.4
	5/27/2017	02:00	0.8	0.5	0.6	0.7	0.4
		08:00	0.7	0.6	0.5	0.6	0.6
		14:00	1.2	0.8	0.9	0.9	0.7
		20:00	0.9	0.6	0.5	0.6	0.5
	5/28/2017	02:00	0.5	0.5	0.6	0.8	0.3
		08:00	0.7	0.5	0.7	0.6	0.4
		14:00	1.0	0.7	0.8	0.9	0.7
		20:00	0.8	0.5	0.6	0.7	0.4
	5/29/2017	02:00	0.7	0.6	0.5	0.6	0.6
		08:00	0.9	0.5	0.6	0,7	0.4
		14:00	1.2	0.7	0.9	0.8	0.6
		20:00	1.0	0.5	0.6	0.8	0.3
	5/30/2017	02:00	0.7	0.5	0.7	0.6	0.4
		08:00	0.8	0.4	0.4	0.7	0.4
		14:00	1.2	0.9	0.8	0.8	0.8
		20:00	0.7	0.6	0.5	0.6	0.6

Table 4-3 List of Noise Detection Results

Date	Monitoring Point	Time Window	Noise Level dB (A)	Remark
201705/27	Mengding Town, Lincang (ZS01)	Day	53.4	--
		Night	40.0	
	Port of Qingshuihe River (ZS02)	Day	51.0	
		Night	40.5	
	Guomen Primary School (ZS03)	Day	50.6	
		Night	40.3	
	Shuanglongjing (ZS04)	Day	51.7	
		Night	41.8	
	Qingshu Village (ZS05)	Day	52.7	
		Night	41.9	
	Bangui (ZS06)	Day	52.5	
		Night	41.7	
201705/28	Mengding Town, Lincang (ZS01)	Day	53.5	
		Night	40.9	
	Port of Qingshuihe River (ZS02)	Day	52.9	
		Night	39.9	
	Guomen Primary School (ZS03)	Day	53.5	
		Night	40.0	
	Shuanglongjing (ZS04)	Day	52.7	
		Night	41.8	
	Qingshu Village (ZS05)	Day	53.2	
		Night	40.2	
	Bangui (ZS06)	Day	52.7	
		Night	40.6	
201705/27	Dawantang (ZS07)	Day	54.2	--
		Night	40.4	
	Banxing Village (ZS08)	Day	53.5	
		Night	40.3	
	Banxing (ZS09)	Day	52.0	
		Night	43.9	
	Tuanjie Village (ZS10)	Day	52.9	
		Night	40.7	
	Dawanjiang (ZS11)	Day	53.0	
		Night	41.1	
	Proposed Hospital Site (ZS12)	Day	52.3	
		Night	41.2	
201705/28	Dawantang (ZS07)	Day	53.2	
		Night	41.0	
	Banxing Village (ZS08)	Day	53.0	
		Night	45.7	

Date	Monitoring Point	Time Window	Noise Level dB (A)	Remark
	Banxing (ZS09)	Day	53.4	
		Night	42.1	
	Tuanjie Village (ZS10)	Day	53.7	
		Night	43.2	
	Dawanjiang (ZS11)	Day	53.6	
		Night	42.1	
	Proposed Hospital Site (ZS12)	Day	53.6	
		Night	42.3	

5. Information of Entrusting Party

Table 5-1 List of Information of Entrusting Party

Client	Management Committee of Lincang Border Economic Cooperation Zone		
Applicant Address	Mengding Town, Lincang		
Contact Person	Mr. Zhao	Tel.	13987004449

6. Annex

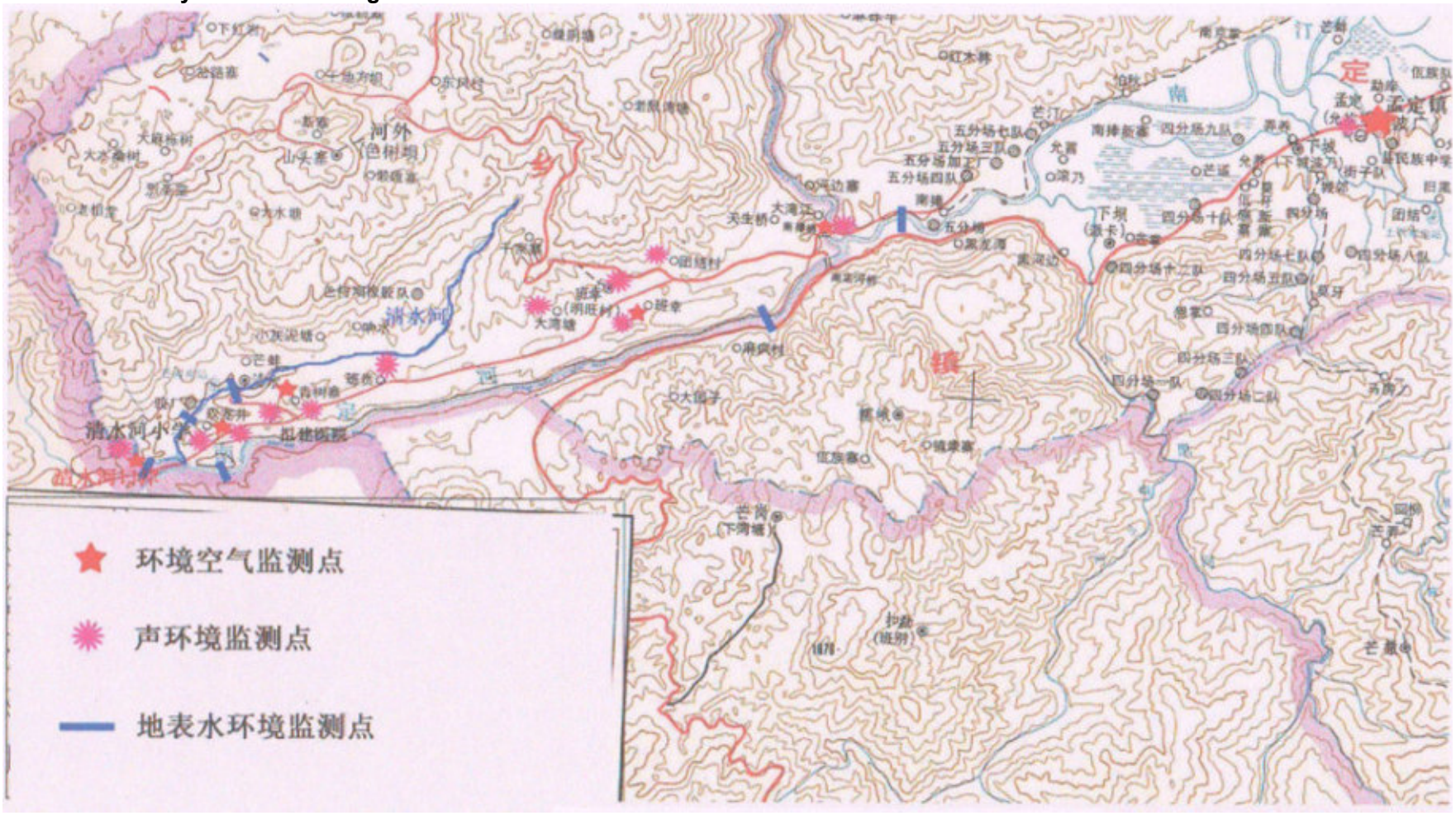
Attachement 1: Layout of Monitoring Sites

(No text below)

Drafted	Xie Fangye		Date	June 08, 2017
Checked by:	Hu Qian		Date	June 08, 2017
Reviewed by	Xi Zhouhong		Date	June 09, 2017
Approved	Chen Meiqiong		Date	June 09, 2017

Source of the above Letter is the Domestic EIA document

Attachment 1: Layout of Monitoring Sites



Annexure 3: Environment Management Plan (EMP)

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
Preconstruction Stage					
1.1 Design Stage	Building specifications and design parameters	Avoid all underground utilities during design. Release of effluents in receptors (air, water, land). Avoid any building design feature that creates semi-permanent areas for Aedes mosquito breeding (e.g. unreachable rain gutters, uneven surfaces of concrete rooftops and floors resulting in water stagnation, etc.)	Local Design Institutes (LDI)	PMO	Included in LDI contract
		Structural Safety for construction, Seismic, soil type specific design of building	LDI	PMO	Included in LDI contract
		Maintain adequate clearance, construction of retaining structures; minimize digging close to the dwellings.	LDI	PMO	Included in LDI contract
	Impact to the existing surface water environment.	i. Construction facilities should be placed at suitable distance from water bodies, natural flow paths, important ecological habitats and residential areas. ii. Careful site selection to avoid existing settlements Interference with drainage patterns iii. Appropriate siting to avoid temporary flooding hazards iv. Prepare water and soil erosion plan	LDI	PMO	Included in LDI contract
	Noise generation	Exposure to noise, location/designed to ensure noise will not be a nuisance to neighbouring properties.	LDI	PMO	Included in LDI contract
	Loss of precious ecological values/ damage to precious species.	Avoid encroachment by careful site and location selection and reconnaissance before final siting of activities.	LDI	PMO	Included in LDI contract
	Loss of trees.	Avoid siting of structures to avoid any permanent loss of trees wherever possible. Implement tree replantation or transplantation as the case may be	PMO	PMO	Included in LDI contract
	Involuntary resettlement or land acquisition.	i. Loss of land and structures - Establish a resettlement office comprising local government officials to manage the resettlement process ii. Conduct community consultation programs and ensure information is disseminated about entitlement based on the Land Administration Law. iii. Ensure that all relocation and resettlement activities are completed before construction starts on any subproject.	LDI	PMO	Included in LDI contract
1.2 Implementation Support	Establish implementation support positions	Contract a Loan Implementation Environmental Consultant (LIEC), river ecology specialists, and various sectorial specialists (water and wastewater, solid waste)	PMO	ADB	Included in loan cost
		Contract a tendering Agency to ensure that the provisions of this	PMO	ADB	10

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
		EMP are included in bidding documents.			
		Contract Environmental Monitoring Station for external monitoring of construction and operations.	PIU	LIEC, PMO	330 660
	PIU to hire environmental staff/consultants for supervision	Appoint Environment Specialist	PIU	PMO, LIEC	PMO and IA in-kind support
1.3 Construction Support	Update EMP	Review EMP to assess if the current mitigation measures need to be updated due to any changes in the final engineering design. For changes in project locations, sites, or other changes that may cause new or greater environmental impacts or involve additional affected people: the PMO will conduct additional environmental assessment and public consultation. The revised environmental assessment reports will be submitted to the PMO, EPB and ADB for approval and disclosure.	LIEC	PMO, ADB	PMO in-kind support, included in loan cost
	Contract documents	i. Include clauses referencing this EMP in the terms of reference for bidders for construction contracts. ii. Prepare environmental contract clauses for contractors, especially the EMP and monitoring plan.	PIU with LDI and Tendering Agency	PMO, LIEC	Included in LDI contract
	Grievance Redress Mechanism (GRM)	i. Implement the GRM described in EIA/EMP document. ii. Establish complaints recording procedures within PMO. iii. Publicize GRM at all construction sites.	PIU, LIEC	ADB, PMO	20
	Construction site planning	i. Construction contractor/PIU prepare Site-specific environment management plan and monitoring, health and safety plan ii. Contractor to assign onsite environment engineer to be direct contact person for PIU and ES. iii. PIU review and approve contractor SEMP	Contractors	PIU, ES	Included in LDI contract
	Environmental Protection Training	Provide training on implementation of this EMP to all relevant agencies, especially the PIU, IAs and contractors. Includes training in GRM and environmental protection and monitoring.	LIEC, ES, EPB	PMO, ADB	84
Construction Phase					
2.1 Water	Domestic wastewater from construction sites	Contractor to provide portable toilets[81] at construction sites. Toilets to be emptied regularly and sewage transported to WWTP.	Contractors	PIU, ES	Included in construction contracts
	Construction wastewater (washing aggregates, pouring / curing concrete, machinery repairs) is	Site planning, management and safeguards i. Interception of all construction wastewater and site runoff water ii. Sediment from construction wastewater and site runoff water to be separated in sedimentation traps before discharge of water	Contractors	PIU, ES	Included in construction contracts

[81]Toilets also include women's facilities at the project sites.

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
	managed	iii. Sediment to be disposed at suitable spoil dumping site iv. Site runoff water containing hazardous and harmful materials (if any) to be treated separately from site runoff.			
	Handling of hazardous and harmful materials	Site planning, management and safeguards: i. Storage facilities for fuels, oil, and other hazardous materials within secured areas on impermeable surfaces, and provided with bunds and cleanup installations; ii. Fuel supplier is properly licensed and follows the proper protocol for transferring fuel, and complies with JT 3145-88 (Transportation, Loading and Unloading of Dangerous or Harmful Goods). iii. Vehicles and equipment are properly parked in designated areas to prevent contamination of soil and surface water. iv. Vehicle, machinery, and equipment maintenance and refueling are carried out so that spilled materials do not seep into the soil or into water bodies. v. Fuel storage and refilling areas are located at least 300 m from stormwater drains, Nanting River and Qingshuihe River. vi. Oil traps for service areas, and parking areas.	Contractors	PIU, ES	Included in construction contracts
2.2: Air	Generation of dust by construction activities	i. Transport containers and vehicles carrying soil, sand or other fine materials to and from the sites must be covered. ii. Materials storage and stockpile sites are covered or sprayed with water. iii. Water is sprayed on bare earth surfaces at construction sites and access roads twice daily. iv. All roads and tracks used by vehicles of the contractors or any subcontractors or supplier are kept clean and clear of all dust, mud, or extraneous materials dropped by vehicles.	Contractors	PIU, ES	Included in construction contracts
	Air emission from vehicles and equipment	i. Equipment and machinery is maintained to a high standard to ensure efficient running and fuel-burning. ii. Avoid leaving machinery running or trucks and other vehicles idling when not in use; iii. A regular inspection and certification system for equipment and machinery is required	Contractors	PIU, ES	Included in construction contracts
	Toxicity and air contamination inside building	Use of low or no volatile organic compounds – water based nontoxic etc.	Contractors	PIU, ES	Included in construction contracts
2.3 Noise and vibrations	Noise from vehicles and construction machinery	i. Noise levels from equipment and machinery conform to PRC standard GB12523-2011. ii. Install portable noise shields near sensitive receptors. iii. When work is planned near sensitive receptors, residents will be	Contractors	PIU, ES	Included in construction contracts

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
		notified by the PIU and/or contractors and any site-specific concerns or working arrangements addressed. iv. Prohibit noise-generating construction work between 2000 and 0600 hours. v. Avoid minority religious activities or festivals (i.e., no construction allowed within 500 meters of any schools, hospitals. vi. If construction noise needs to continue into the night, the contractor must first consult with the PIU, ES, and local communities and obtain their agreement.			
	Noise and vibrations	Selection of construction techniques and machinery to minimize ground disturbance.	Contractors	PIU, ES	Included in construction contracts
2.4 Soil	River bed cleanings	The soil extracted from river channel shall only be reused on-site if it complies with Class II of Soil Environmental Quality Standard (GB15618-1995), which is the equivalent soil quality for the adjoining agricultural lands.	Contractors	PIU, ES	Included in construction contracts
	Foundation soil Excavations	i. All spoil material will be stacked at a location near designated green belt area or storage areas ii. Land will be reinstated following completion of construction. iii. Contract clauses specifying careful construction practices.	Contractors	PIU	Included in construction contracts
2.5 Soil erosion and stability	Erosion from construction sites	i. Construct interception ditches and drains to prevent runoff entering construction sites, and to divert runoff from sites to existing drainage. ii. Limit construction and material handling during periods of rains and high winds. iii. Stabilize all cut slopes, embankments, and other erosion-prone working areas while works are going on. iv. All earthwork disturbance areas shall be stabilized within 30 days after earthworks have ceased at the sites. v. Preserve existing vegetation where no construction activity is planned.	Contractors	PIU	Included in construction contracts
	Green Belt establishment	i. On sloping lands, all preparation for plantations must be conducted according to technical specifications of soil and water conservation for sloping land set in Soil and Water Conservation Law of PRC (2010). In particular, soil tillage on terraces must be carried out along contours, keeping any existing vegetation between contour terraces to prevent soil erosion. ii. Geotextile or hessian matting will be laid and pegged over exposed slopes	PIU, contractors	PMO	Included in construction contracts
2.6 Solid Waste	Domestic waste from construction site	i. Provide appropriate waste storage containers; ii. Trash collection bins are regularly sprayed with pesticides to	Contractors	PIU, PMO	Included in construction

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
		reduce flies; iii. Wastes are stored away from water bodies and regularly hauled to a suitable landfill or designated dumping site.			contracts
	Construction wastes causing adverse impacts on surrounding environments.	Construction wastes that cannot be reused will be regularly transported off-site for disposal, and not allowed to accumulate on site over long periods.	Contractors	PIU, PMO	Included in construction contracts
2.7 Flora and Fauna	Habitat retention	Loss of existing native trees and shrubs in embankment construction will be replaced by the same species in landscaping and in habitat re-establishment in embankments. To minimize impacts on existing riverside: i. prohibit construction activities or use of noise-intensive machinery during fish spawning season (April-June) and migration season (June to September); ii. prohibit construction activities at night; iii. avoid water pollution from construction spoils and oil leakage; iv. locate construction camp at least 500-m away from rivers; v. awareness building and training of construction workers. In all cases, the poaching or harming of any wildlife by construction workers will be strictly prohibited. At the construction site of the water supply pipeline for WTP, ensure protection of vegetation along river bank.	Contractors, PIU	PMO, River ecology specialists of LIEC	Included in construction contracts
	Invasive species	Prohibit the use of any plant species classified in the PRC as weeds, as defined by the China National Invasive Plant Database (http://www.agripests.cn and by the Ministry of Environment Protection and Chinese Academy of Sciences.	LDI, PIU Contractor	PMO, LIEC	Included in construction contracts
	Loss of vegetation and deforestation.	Marking of trees, vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance. Construction contractor will replant trees to be cut within the subproject premises along green belts.	Construction Contractor	PIU, ES	Included in construction contracts
2.8 Social and Culture	Traffic management – all components	A traffic control and operation plan must be prepared by the contractor in consultation with the local traffic management authority prior to any construction. The plan will include: i. Selection of haulage routes to reduce disturbance to regular traffic. ii. Trucks hauling construction material and waste to be fully covered.	Contractors	PIU, PMO, local traffic police	Included in construction contracts

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
		iii. Divert or limit construction traffic at peak traffic hours. Construction traffic at the school site will be avoided during critical periods such as school drop off and pick up times. iv. project owner to work with local highways authority and traffic police to carry out road maintenance work during the construction process. v. Construction units to strengthen traffic safety education for vehicle drivers vi. Construction vehicles on designated routes or locations such as in the crossing of villages, densely populated areas and near sensitive locations (schools, health facilities and other social services) to drive slowly and according to designated speed limits (e.g. 30 km/h);			
	Work camp health and hygiene	i. Ensure awareness of communicable diseases for the construction work forces and nearby communities. conducting regular information, education and communication (IEC) campaigns addressed to all site staff and labor (including truck drivers and delivery crews) and the immediate local communities concerning project risks and impacts, and appropriate preventative behaviors with respect to STIs, including HIV, malaria, dengue and other vector-borne diseases, vaccine-preventable diseases, tuberculosis and other infectious diseases; ii. Inform workers about where they can go to for diagnosis and treatment of various conditions (camp site medical facilities, Qingshuihe Health Center, nearest hospital), vaccination services, voluntary counseling and treatment. Develop peer educator program for workers and providing work time for peer educator's activities. Distribute condoms to project workers and educating them regarding use. iii. Ensure worker accommodations meet international health and safety standards to mitigate environmental, health and safety risks. Ensure construction sites, canteens, food, water and food handling, and toilets, are maintained under hygienic conditions as outlined by international standards for worker accommodations iv. Construction site operations comply with PRC State Administration of Worker Safety Laws and Regulations. In collaboration with local health services, construction workers	Contractors	PIU, IAs	Included in construction contracts

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
		can be screened and treated for infectious diseases such as malaria, dengue, sexually transmitted infections upon recruitment and before leaving to their home communities. Periodic examinations by occupational health physicians should be available to all construction workers for screening, early diagnosis and treatment of occupational diseases and key infectious diseases. PRC State Administration of Worker Safety Laws and Regulations.			
	Community safety (all sites)	i. At all times during construction, safe and convenient passage must be given for community vehicles, and pedestrians to and from side roads. ii. Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warnings. iii. At the end of each day, all sites and equipment will be made secure (through fencing and/or lock-down of equipment) to prevent public access. iv. Establish regular engagement and discuss with Qingshuihe Health Center capacity to ensure capacity of the center to provide medical services to the construction workforce and strengthen health staff at the center or at the worker camps medical facilities.	Contractors	PIU	Included in construction contracts
	Construction site safety (all sites)	i. To the extent possible, protect all persons and nearby property from construction accidents. ii. Comply with all national and local safety requirements and any other measures necessary to avoid accidents. iii. Provide protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed boots) for construction workers and enforce their use. iv. Ensure sites and machinery are sealed or closed at night and off-limits to the general public. v. For residents next to construction (especially loud noise), erection of noise barriers, ensure residents are aware of the duration and nature of works, potential hazards, and offer to provide ear plugs/dust masks/other basic safety equipment. vi. During heavy rains / emergencies, suspend all work.	Contractors	PIU	Included in construction contracts
	Construction site safety (pipe-laying)	Trenches will be dug, pipes laid, and the trenches closed, in the same operation. This will ensure that open trenches are not left over an extended period to pose a safety risk or to erode and cave-in.	Contractors	PIU	Included in construction contracts

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
	Loss of power supply to the local community when distribution lines crossing the new subprojects are switched off.	Advance notice to the public about the time and the duration of the utility disruption. Restore the utilities immediately to overcome public inconvenience.	Contractors	PIU	Included in construction contracts
	Cultural, physical and natural heritage protection	If a chance find or a cultural artifact is unearthed, stop work and immediately report the matter to the IAs, PMO and local Cultural Relics Preservation Bureau for guidance on next steps.	Contractors	PIU, PMO	Included in construction contracts
2.9 Capacity Building	Improve standards of implementation and monitoring.	Training of PMO.	PMO.	All subprojects	Included in construction contracts
2.10 Unexpected environmental impacts		If unexpected environmental impacts occur during project construction phase, immediately inform the PMO; assess the impacts; and update the EMP	IA	PMO, LIEC	Included in construction contracts
Operations Stage					
Output 1: Cross Border Capacity Improved					
Trade Center market					
3.1 Solid Waste	Unsegregated trading center waste lying in open	Proper segregation and storage in collection centers	Owners of Trading center	EPB	Cost to owner of enterprise
International production center					
3.2 Air	Air Emissions from production facilities	Monitor air pollution from the production centers to adhere to PRC standards	Owners of Enterprises	EPB	Cost to owner of enterprise
3.3 Noise	Noise due to production center	Monitor Noise pollution from the production centers to adhere to PRC standards	Owners of Enterprises	EPB	Cost to owner of enterprise
3.4 Water	Waste water being discharged without meeting relevant requirements/standards	i. Procure wastewater quality monitoring devices for real-time monitoring ii. Establish real-time monitoring framework iii. Wastewater should be pre-treated by responsible industries and only after meeting relevant standards , can be discharged into wastewater collection network	IA	EPB	Included in project components
3.5 Solid Waste	Unsegregated industrial production waste lying in open	Proper segregation and storage in collection centers	Owners of Trading center	EPB	Cost to owner of enterprise
Roads and Bridge					
3.6 Air	Exhaust emissions from predicted traffic volumes on roads and intersections	i. Roadside air pollution monitoring ii. Vehicle inspections, compliance stickers, maintenance and scrapping programs	IA	EPB	Included in project components

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
3.7 Noise	Noise from increasing traffic volumes on Project roads	Noise monitoring at regular intervals to check compliance	IA	EPB	Included in project components
	Noise impact from traffic on sensitive receptors	Implementation of mitigation measures, including noise barriers and noise-proofing of buildings, where levels exceed PRC standard	IA	EPB	Included in project components
3.8 Emergency preparedness and response	Spills of hazardous materials in road accidents	i. Establishment of a road accident emergency command organization; ii. Emergency response plan prepared and put in place; iii. Preparation of emergency equipment and training.	IA and Operators, local Security Bureau	EPB	100
	Fire and explosion hazard at charging/filling stations	Regular inspection of transformer, storage tanks and record-keeping; Control of ignition sources; Emergency response plan prepared and put in place; Preparation of emergency equipment and awareness training.	Operator	Office of Public Security	Included in operating costs
3.9 Ecology	Roadside and medium strip planting	Planting and maintenance of trees and shrubs along roads and around interchanges, especially where screening is required.	Contractor	PMO	Included in operating costs
	Migration of Terrestrial small	Make culverts over know paths for migration of Amphibians, small	Contractor	PIU	Included in operating costs
	Fish migration in Nanting River	Establish a fish management and monitoring system which will include a comprehensive aquatic monitoring program.	DI hired to conduct site survey	PIU	Included in operating costs
	Water and soil erosion	Implementation of soil erosion prevention activities	Contractor	PIU	Included in operating costs
Output 2: Social infrastructure and Service improved					
Schools					
3.10 Water	Overall river water flow due to flooding	Record and monitor all river flow adjoining the school	School	PIU	Included in operating costs
3.11 Solid waste	Solid waste lying in the school	Training of personnel and children in proper segregation and storage	School	PIU	Included in operating costs
3.12 Health and safety and emergency response	Lack of awareness for health and safety procedure and emergency response.	Training of personnel on safety and emergency response in compliance with City's Emergency Management Agency requirements	School	PIU	Included in operating costs
Hospitals					
3.13 Water	Hospital sewage directly flowing into city drains	I. Maintenance and regular upkeep of sanitation network in hospitals avoid surface discharge. Ii Sewage water treated for infectious diseases with pesticide etc.	Hospital	EPB, PIU	Included in operating costs

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
3.14 Solid waste	Unsegregated Solid waste transported to landfill site	Training of hospital personnel in proper segregation and storage and medical and solid waste	Hospital	EPB, PIU	Included in operating costs
3.15 Health and safety and emergency response	Lack of awareness for health and safety procedure and emergency response.	Training of hospital personnel on safety and emergency response in compliance with City's Emergency Management Agency requirements	Hospital	EPB, PIU	Included in operating costs
Transportation					
3.16 Health and Safety	Operation of electrical safety systems, fire safety systems at charging stations.	Maintenance of charging electrical switchbox located within secure casings.	Operator	PIU	Included in operating costs
Output 3: Integrated urban environmental infrastructure improved.					
Water Supply					
3.17Water	Water source protection and Cumulative effect on water extraction	Monitor hydrological conditions in the River and Nangun National Reserve. Manage irrigation demands to ensure adequate flow.	Operator	LMG	Included in operating costs
	Solid waste (sludge) from WTP operations	Develop and implement a sludge handling plan which includes: i. Collection and storage of sludge ii. Transport iii. Environmentally sound disposal of sludge iv. Health and safety safeguards	Operator	PIU	Included in operating costs
	Disinfection chemicals formulation, handling and storage	i. Chlorination room and storage equipped with alarms and breathing apparatus ii. Emergency response and evacuation plan implemented iii. Awareness program	Operator	EPB	Included in operating costs
3.18 Health and Safety	Health and safety of WTP operating staff	i. Compulsory use of safety equipment and clothing as necessary, including shoes or boots with non-slip soles, protective and chemical resistant clothing, safety goggles; ii. Wearing of respiratory mask in the sludge dewatering and de-odor workshops and when moving and transporting sludge; iii. Posting and briefing on safety instructions for the storage, transport, handling or pouring of chemicals, and entry into confined spaces	WTP O&M Unit	PMO	Included in operating costs
	Hazardous materials handling	i. The chlorination room and chemical storage area will be equipped with automatic alarms, which will be triggered by chlorine dioxide leakage. ii. The duty room will be equipped with gas masks, oxygen breathing apparatus and other rescue materials iii. An emergency response plan will be developed and implemented.	Operator	PIU	Included in operating costs

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
Waste water treatment					
3.19 Water	Wastewater discharged without meeting relevant standard for river discharge	i. Install wastewater quality monitoring devices for real-time monitoring at LBECZ WWTP ii. Establish real-time monitoring framework	WWTP O&M Units	PMO	Included in operating costs
3.20 Air	Odor from WWTP	i. Equip odor generating facilities with ventilation or odor containment. ii. Implement timely sludge cleanup. iii. Institute daily check, repair and maintenance of all wastewater treatment facilities/equipment.	O&M operator	EPB	Included in operations cost
3.21 Noise	Noise produced during wastewater treatment (mechanical equipment)	i. Design and implement noise absorbing, noise reduction, noise insulation and vibration reduction measures during operation. Adopt low noise level equipment. ii. Create green buffer zone >50m.	O&M operator	EPB	Included in operations cost
3.22 Solid Waste	Disposal of sludge from Sewage settlement ponds	Develop and implement a sludge handling plan which includes: i. Treatment for use as composting, and ii. Disposal in landfill	O&M operator	EPB	Included in operations cost
	River crossings of sewerage pipes (existing)	i. Erection of warning signs at crossing points ii. Pipelines checked and maintained iii. Establishment of an emergency response plan for leakage or accident	O&M operator	PIU	Included in operations cost
	Water quality monitoring	River water quality monitoring programme during operation Water quality monitoring for water treatment plant in the catchment	O&M Unit	PMO	Included in operating costs
Solid Waste Project					
3.23 Water	Groundwater quality (collection center)	To ensure that leachate at collection sites is not penetrating into the groundwater, a monitoring program will be implemented.	O&M Unit	PMO	Included in operating costs
3.24 Air	Noise (Collection area)	i. Scheduling working hours and transportation routes for garbage collection and disposal, avoiding urban traffic peak period and sensitive location; ii. Selecting low noise equipment and vehicles in the acquisition of machines and vehicles; and iii. Installing sound insulation at compaction sites.	O&M Unit	PMO	Included in operating costs
	Garbage transportation garbage to landfill	i. All haulage vehicles will be covered, and progressively enclosed as the fleet is new. ii. Retaining fences will be erected around the collection site to prevent the waste from spreading during windy or rainy season.	O&M Unit	ES	Included in operating costs
3.25 Health and safety	Odors and pests (waste collection stations)	i. To reduce the breeding of flies, mosquitoes, rats and other vermin, and to prevent odor and wind-borne dispersal of garbage, ii. Periodic spraying with approved pesticide will further control the	O&M operator	PIU, ES	Included in operating costs

Item	Potential Environmental Issues and Impact	Mitigation Measure	Who implements	Who Supervises	Cost (CNY x 10^3)) and Fund source
		breeding of flies and mosquitoes.			
River Rehabilitation					
3.26 Flora and fauna	Manage the built landscaped embankments	i. Maintain the landscaping – watering, weeding, stabilizing, survival and growth of planted trees, shrubs and herbs, with replacement and corrective action as necessary. ii. Provide security and surveillance to guard against misuse, theft and littering. iii. Regularly remove garbage and transport to landfill. iv. The operating and maintenance units will provide monthly monitoring reports to the PIU and PMO on the survival and growth of planted trees, shrubs and herbs, with replacement and corrective actions as necessary.	O&M Unit	PMO	Included in operating costs
	Reduction in benthic habitat and reduction in aquatic life and fish species	Fish migration, spawning periods avoided	PMO, Construction contractor	Bridge, River rehabilitation,	Included in operating costs
	Plantation forest management	Green belt forests will require intensive management during the establishment phase.	O&M Unit	PMO	Included in operating costs
3.27 Emergency preparedness and response	Flood warning and emergency system	Review flood emergency preparedness and response system for the project area, and identify improvement opportunities.	IA	PMO, ADB	Included in operating costs
All Components					
3.28 Unexpected environmental impacts	All areas	If unexpected environmental impacts occur during project operations, immediately inform the PMO; assess the impacts; and update the EMP	All O&M Units	PMO	Included in operating costs

Sources: PPTA Team; Project. ADB = Asian Development Bank, LDI =local design institute, EIA = Environmental Impact Assessment, EPB = Environment Protection Bureau, LMG = Lincang Municipal Government, LIEC = Loan Implementation Environmental Consultant, O&M = Operation and maintenance, PMO = Project Management Office, RP = Resettlement Plan, WTP = Water treatment plant, WWTP = Waste water Treatment Plant, Solid Waste Management (SWM).

Annexure 4: Environment Monitoring Plan (Environmental Parameters)

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Who Implements	Who Supervises	Cost (CNYx1000)
1.Air Quality	A. Pre-construction and Design stage (Baseline development)	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Meng Ding Town; Qingshuihe River port; Shuanglong well; Ban Xing; Qingshu village; Davangjiang River; nitangchang ditch; Bai Yan village; Cangyuan County Meng Dong reservoir.	One time	Grade II air quality standard of ambient (GB3095-2012).	LDI	PIU,	LDI Budget
	B. Construction Stage	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Qingshuihe River port; Shuanglong well village	Every one month of construction period	Grade II air quality standard of ambient (GB3095-2012).	Construction contractor	PIU, EPB	Included in Construction contractor costs
	C. Operation Stage	PM_{10}, $PM_{2.5}$, SO_2, NOx, SPM, CO (Visible dust)	Qingshuihe River port; Shuanglong well village	One time during commissioning	Grade II air quality standard of ambient (GB3095-2012).	O&M operator	PIU, EPB	Included in O&M operator costs,
2.Water Quality	A. Pre-construction and Design stage (Baseline development)	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	500m away from the upper reaches of the Nan Ting River at the Nan Ting River Bridge, 1500 m away from the lower reaches of the Nan Ting River at the Nan Ting River Bridge, 500m away from the upper reaches of Qingshuihe River, 500m away from the lower reaches of Qingshuihe River, 500m away from the upper reaches of the Nan Ting River at the intersection of Qingshuihe River and Nan Ting River, and 50m away from the lower reaches of the South Cretin river at the intersection of Qingshuihe River and Nan Ting River. The wastewater from Zhenkang county was discharged into the place of 100m away from the upper reaches of No. 2 road of South Umbrella River, and the wastewater from Zhenkang county was discharged into the South umbrella river before entering the sinkhole. 500m away from the upper reaches of Palin River and the upstream of Meng Dong River upstream (Meng Dong River); 100m away from the Cangyuan county sewage treatment plant is discharged into the upstream of Meng Dong River.	One time	Grade III water quality standard in surface water environmental quality standard (GB3838-2002). Grade IV water quality standard in surface water environmental quality standard (GB3838-2002).	LDI, PIU	PMO EPB	Included in LDI costs
	B. Construction	EC, TSS, DO, BOD, P^H Oil	Nanting river	One time	Grade III water quality standard in surface	Construction contractor	PIU, EPB	Included in Construction

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Who Implements	Who Supervises	Cost (CNYx1000)
	Stage	and grease, Pb,			water environmental quality standard (GB3838-2002).			contractor costs
	C. Operation Stage	EC, TSS, DO, BOD, P^H Oil and grease, Pb,	Nanting river General wastewater discharge outlet of each subprojects	One time during commissioning	"Standard for pollutant discharge of urban sewage treatment plant", 1 Class-B standard, standard for water quality of sewage discharged into urban sewer (GB/T31962-2015), 1 Class-B, standard of water pollutant discharge standard of medical institution (GB18466-2005), Grade 2 pretreatment standard	PIU/O&M operator	PIU, EPB	Included in O&M operator costs,
3.Noise/ Vibration	A. Pre-construction and Design stage (Baseline development)	Noise level [dB(A)]	Meng Ding Town; Qingshuihe River port; national Gate Primary School; Shuanglong well; Qingshu Zhai; benggui; Da Wan Tong; bengxing village; Ben Kok; unity village; Da Wan River; new hospital site;	One time	Grade II standards in the quality standard for sound environment (GB3096-2008).	LDI	PIU,	LDI Budget
	B. Construction Stage	Noise level [dB(A)]	Qingshuihe River port and Shuanglong well village	Every one month of construction period	Environmental noise emission standard for construction field Grade II standards in the quality standard for sound environment (GB3096-2008).	Construction contractor	PIU, EPB	Included in Construction contractor costs
	C. Operation Stage	Noise level [dB(A)]	Qingshuihe River port and Shuanglong well village Sites boundaries of other sub projects, including four boundaries on East, South, West and North direction	One time during commissioning	GB12348 - 2008 standards for environmental noise emission from industrial enterprises, Grade 3 of standards, Grade 4 standards for environmental noise emission from industrial enterprises (GB12348-2008),	PMO	PIU, EPB	Included in O&M operator costs,

Environmental component	Project stage	Parameters to be monitored	Sampling Location	Monitoring Frequency	Regulatory Standards for parameter	Who Implements	Who Supervises	Cost (CNYx1000)
					Grade 1 standards in hospitals, and 2 categories in other regions			
4. Soil	A. Pre-construction and Design stage (Baseline development)	pH, TP, TN, Zn, Cu, Pd, As, Cd, Pesticides, Visible spills and/or soil staining, Oil & grease	LBECZ, Canguyuan, Zhenkang	One sample per site analyzed before construction commences	Environmental Quality Standard for Soils (GB 15618-1995).	LDI	PIU,	LDI Budget
	B. Construction Stage	pH, TP, TN, Zn, Cu, Pd, As, Cd, Pesticides, Visible spills and/or soil staining, Oil & grease	LBECZ, Canguyuan, Zhenkang	One sample per site analyzed during construction period	Environmental Quality Standard for Soils (GB 15618-1995).	Construction contractor	PIU, EPB	Included in Construction contractor costs
	C. Operation Stage	pH, TP, TN, Zn, Cu, Pd, As, Cd, Pesticides, Visible spills and/or soil staining, Oil & grease	LBECZ, Canguyuan, Zhenkang	One time during commissioning	Environmental Quality Standard for Soils (GB 15618-1995).	PMO	PIU, EPB	Included in O&M operator costs,

Abbreviations:

SO_{2-} -Sulphur Dioxide; NO_{2-} - Nitrogen Dioxide; CO- Carbon Monoxide; Pb – Lead; $PM_{2.5}$ - Particulate Matter <2.5; PM_{10} - Particulate Matter <10;
EC – Electric Conductivity; TSPM- Total Suspended Particulate Matter; DO - Dissolved Oxygen; TSS - Total Suspended Solids; TN – Total Nitrogen, Total Phosphorus
BOD - Biological Oxygen Demand; ORP – Oxidation Reduction Potential
LDI: Local Design Institute

Environmental Safeguard Clauses for Civil Works Contracts

The general environment, health and safety obligations of the Contractor within this Contract, without prejudice to other official provisions in force, include the following:

- The Contractor shall ensure that the construction and decommissioning of project facilities comply with (a) all applicable laws and regulations of PRC relating to environment, health and safety; (b) the Environmental Safeguards stipulated in ADB's Safeguards Policy Statement (2009); and (c) all measures and requirements set forth in the environmental management plan (EMP).
- The Contractor shall establish a telephone hotline to received community complaints, staffed at all times during working hours. Contact details shall be prominently displayed at the sites. The Contractor shall disseminate in a timely manner information on the construction progress, including anticipated activities that might cause safety risk.
- The Contractor shall secure all necessary permits and licenses before undertaking the works.
- The Contractor shall assign sufficient qualified staff to manage site-EMP implementation, and ensure adequate financial resources are available to implement the site-EMP throughout the construction period.
- The Contractor shall provide equal pay for equal work, regardless of gender or ethnicity; provide those they employ with a written contract; provide the timely payment of wages; use local unskilled labor, as applicable, comply with core labor standards and the applicable labor laws and regulations, including stipulations related to employment, e.g. health, safety, welfare and the workers' rights, and anti-trafficking laws; and not employ child labor. The Contractor shall maintain records of labor employment, including the name, ethnicity, age, gender, domicile, working time, and the payment of wages.
- All buildings shall be designed in compliance with relevant the PRC's design standards and codes for energy-efficient, safe buildings, including but not limited to: PRC national standards. Only low or no volatile organic compound (VOC)-emitting materials shall be used (including paints, coatings, adhesives, carpet and furniture's) to ensure high indoor air quality. Water-based nontoxic, no allergenic paint for drywall or plaster surfaces shall be preferred to latex or oil-based paints. All facilities shall be properly sited to minimize the risk of scouring that may result from increase intensity of precipitation as a result of climate change.
- The Contractor shall take necessary precautions to avoid interruptions to water supply, wastewater collection, heating and other utility services during the civil works.
- The Contractor shall prepare a Site specific construction site-EMP (ESEMP) based on the EMP attached here.
- The Contractor shall take appropriate sanctions against personnel violating the applicable specifications and provisions on environment, health and safety.
- The Contractor shall document, and systematically report to the school management/community and the project implementation unit (PIU), of each incident or accident, damage or degradation caused to the environment, workers or residents or their assets, in the course of the works.
- The Contractor shall provide all relevant information about the Site-EMP to subcontractor/s and be responsible for their actions.
- The Contractor shall provide the PIU with a written notice of any unanticipated environmental, health and safety risks or impacts that arise during implementation of the contract that were not considered in the EMP.

Environmental Site Inspection and Monitoring Checklist

Note: This form is designed for use by the project implementation unit (PIU) coordinator during site inspections and monitoring and may not be exhaustive. Modifications and additions may be necessary to suit individual sub-projects and to address specific environmental issues and mitigation measures.

Name of school: _____
Location: _____
Inspection Date: _____
Inspection Time: _____
Inspector(s): _____

Inspection Item	Yes	No	N.A.	Remarks (i.e. problem observed, possible cause of nonconformity and/or proposed corrective/ preventative actions)
1. Has contractor appointed a construction supervisor and is the supervisor on-site?				
2. Is information pertaining to construction disclosed at construction site (including construction period, contractor information, grievance hotline, etc.)?				
3. Are chemicals/hazardous products and waste stored on impermeable surfaces in secure, covered areas?				
4. Is there evidence of oil spillage?				
5. Are chemicals stored and labeled properly?				
6. Is construction equipment well maintained (any black smoke observed)?				
7. Is there evidence of excessive dust generation?				
8. Are there enclosures around the main dust-generating activities?				
9. Does contractor regularly consult with school management as well as nearby residents to identify concerns?				
10. Is there evidence of excessive noise?				
11. Any noise mitigation measures adopted (e.g. use noise barrier/enclosure)?				
12. Is construction wastewater and domestic wastewater discharged to sewer systems (if possible), or are on-site treatment facilities (soak pit) provided?				
13. Is there any wastewater discharged to soil or surface water?				
14. Is the site kept clean and tidy (e.g. garbage free, good housekeeping)?				
15. Are separated labeled containers/areas provided for facilitating recycling and waste segregation?				
16. Are construction wastes/recyclable wastes and general refuse removed off site regularly?				

Inspection Item	Yes	No	N.A.	Remarks (i.e. problem observed, possible cause of nonconformity and/or proposed corrective/ preventative actions)
17. Is safe supply of clean water and an adequate number of toilets provided for workers?				
18. Is personal protection equipment provided for workers?				
19. Are clear information and warning signs placed at construction sites in view of the students and staff as well as the public?				
20. Are all construction sites made secure, discouraging access through appropriate fencing?				
21. Are disturbed areas properly re-vegetate after completion of works?				
22. Were any complaints filed with the contractor, and have staff and nearby residents raised any concerns related to the performance of contractor?				
23. Any other problems identified or observations made?				

_____

Date, Name and Signature of PIU staff/ consultant

Annexure 5: Environmental Safeguard Monitoring Report

Environmental Safeguard Monitoring Report

Reporting Period {From Month, Year to Month, Year}
Date {Month, Year}

PRC: Yunnan Lincang Border Economic Cooperation Development Zone Project

Prepared by the Project Management Office, Lincang Border Economic Cooperation Zone Project, PRC for the Asian Development Bank

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Annexure 6: Public Disclosure and Public Consultations

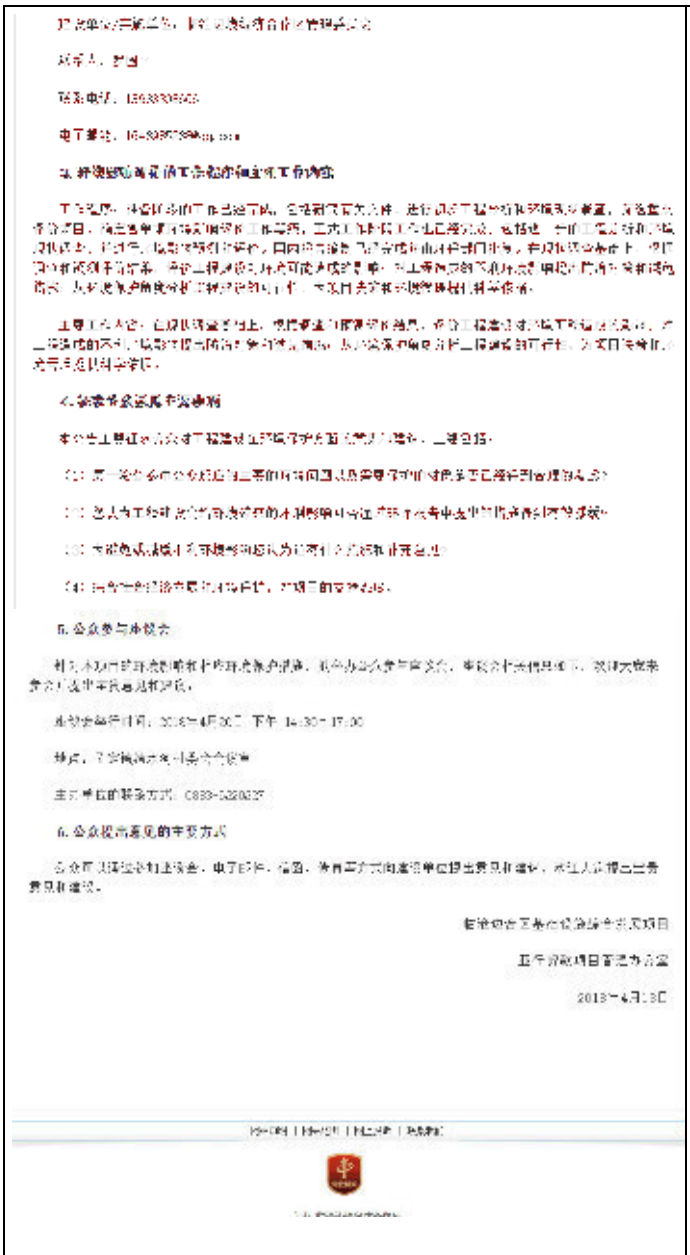
Figure A6.1: Examples of information disclosure by on-line posting

First round

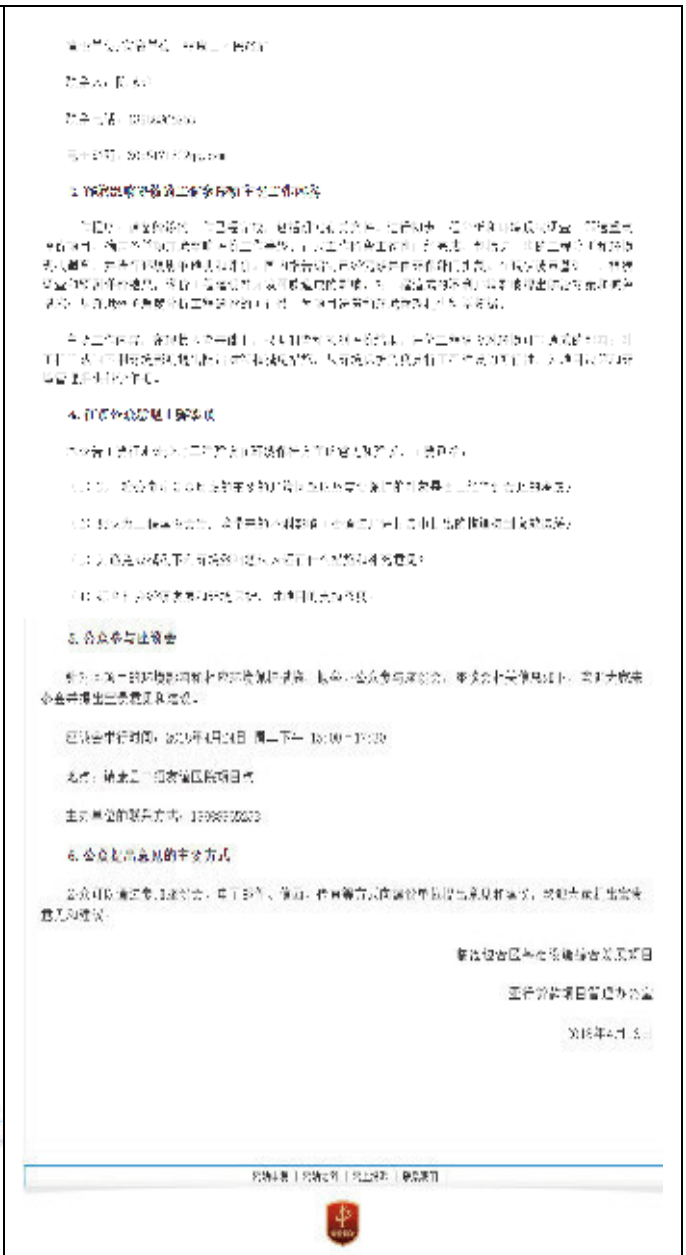
LBECZ Area (Date: 2018.1 .27)	Zhenkang (Date : 2087.1.27)
 临沧边境经济合作区基础设施综合发展项目环境影响评价信息公示	

Cangyuan (Date: 2017.1.27)

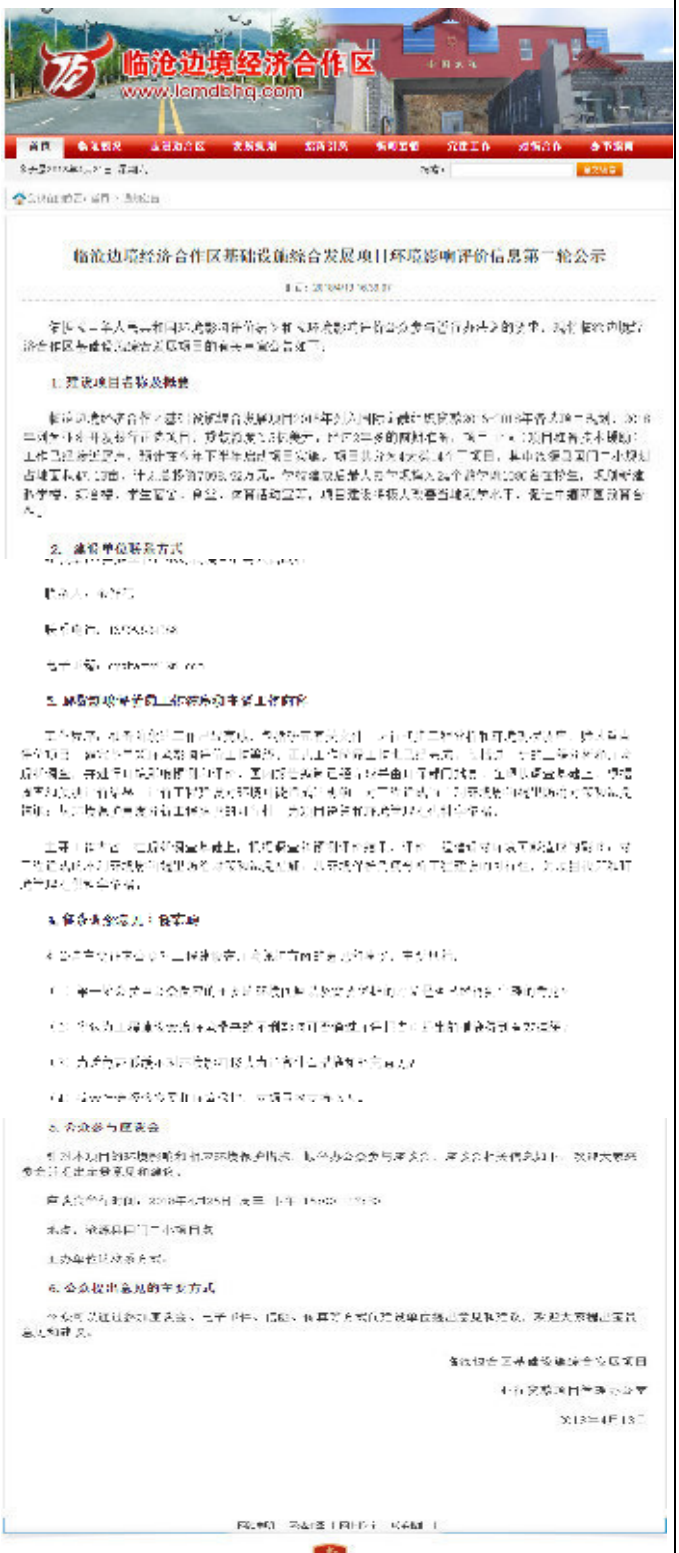
Second round



LBECZ Area (Date:2018.14.13)



Zhenkang (Date: 2018.04.13)



Cangyuan (Date: 2018.04.13)

Source: PMO

Figure A6.2: Examples of information disclosure by public notices

First round

LBECZ Area (Date: 2018.1.30)

Zhenkang (Date: 2018.1.30)

Cangyuan (Date: 2018.1.30)

Second round	
 LBECZ Area (Date: 2018.04.13)	 Zhenkang (Date: 2018.04.13)
 Cangyuan (Date: 2018.04.13)	

Source: PMO

Table A6.1: Details in Public Consultation Questionnaire for Group Investigation

Name of Institute/Organization	(Official Seal)			Applicant	
Address of Institute/Organization				Contact Information	
Nature of Institute/Organization	□Government □Institution	Number of Employees		Position	

	□Enterprise □Other				

Survey Content (Please tick √ in the corresponding box to the option of your choice)	
No.	Questions Asked to Individuals, institutions, groups, stakeholders
1	Does your Institute/organisation know and understand the scope of project construction? (Single Choice) □Do not know □ Know but do not understand □Understand
2	What does your institute/organization think is the current status of local environment in the area? □Good □Ordinary □Bad
3	In the view of your institute/organization, what is the most serious local environmental problem? □Air Pollution □ Noise Pollution □Bad Ecological Environment □Water Environment Pollution □Poor Drinking Water Quality □Other
4	In the view of institute/organization, what negative effect will be brought by the construction period of this project to environment? (Multiple Choice) □Waste Gas □Wastewater □Noise □Solid Waste □Ecological Damage □Other
5	In the view of institute/organization, what environmental protection measures should be undertaken for reducing the negative effect during the project construction period? (Multiple Choice) □Construction of Wastewater Treatment Facilities □Strengthening the area and road greening □Strengthening construction management □Other
6	In the view of institute/organization, what negative effect will be brought by the operating period of this project to environment? (Multiple Choice) □Impact to Surface Water □Groundwater Impact □Stench Impact □Noise Impact □Other
7	In the view of institute/organization, what environmental protection measures should be undertaken for mitigating the negative effect brought by project operating period? (Multiple

	Choice) □Sewage Treatment Facilities □Air Control Measures □Strengthening Ecological Protection □Strengthening Operation Supervision □Other,
8	What is the most concerned problem of your institute/organization in this project? □Air □Surface Water □Groundwater □Solid Waste □Earth □Stench
9	In the view of your institute/organization, what is the effect to environment from this project construction? (Single Choice) □Positive Effect □Negative Effect □No Effect
10	After the comprehensive consideration, what is the attitude of your institute/organization towards this project construction? If not in support, please explain the reason. (Single Choice) □Support □Indifferent □Do not support, Reason
	What other specific requirements, suggestions and issues need to be clarified about the environmental protection in this project?
Note	Other comments and suggestions, as well as some specific requirements, can be expressed in writing. If necessary, a separate sheet of instructions is allowed.

Table A6.2: Public Consultation Questionnaire for Individual investigation

Name		Gender		Occupation		Contact Information	
Nationality		Age		Degree of Education			
Address of Family or Institute							
Survey Content (Please tick √ in the corresponding box to the option of your choice)							
No.	Questions Asked to Individuals, institutions, groups, stakeholders						
1	Do you know and understand the scope of project construction? (Single Choice) □Do not know □ Know but do not understand □Understand						
2	What do you think is the current status of local environment in the area? □Good □Ordinary □Bad						
3	In your opinion, what is the most significant local environmental problem?						

	□Air Pollution □ Noise Pollution □Bad Ecological Environment □Water Environment Pollution □Poor Drinking Water Quality □Other
4	In your opinion, what negative effect will be brought by the construction period of this project to environment? (Multiple Choice) □ shortage or pollution of water for human consumption, irrigation, and other downstream uses □ adversely impact the water or soil resource in the locality □ adversely change migration pattern of animals that would destroy fields, habitats □ cause health and safety issues in the area □ cause excessive generation of wastes and odor □ cause widespread flora/fauna imbalance by cutting fruit and commercial trees in the locality □ Labor influx in the area □ Other
5	In your opinion, what environmental protection measures should be undertaken for reducing the negative effect during the project construction period? (Multiple Choice) □Reduction of construction waste/domestic waste going to rivers □Strengthening the area and restoration of greening near roads etc. □Strengthening construction management practices □Appropriate disposal of construction waste dumping □Other
6	After understanding the environmental mitigation measures undertaken by LBECZ during the construction period, can you accept the impact of the expected construction period? □Yes □Indifferent □No
7	In your opinion, what negative impacts will happen during the operating period of this project to environment? (Multiple Choice) □Impact to Surface Water □Groundwater Impact □Stench Impact □Noise Impact □ Excessive migrant labor_____ □Other
8	In your opinion, what environmental protection measures should be undertaken for mitigating the negative effect brought by project operating period? (Multiple Choice) □ Strengthening waste handling processes □ Air Control Measures □Strengthening Ecological Protection □ Restoration of Green cover □Strengthening Operation Supervision □Other,
9	After understanding the environmental mitigation measures undertaken by the Construction contractor during the operation period, can you accept the anticipated impact of the operation period? □Yes □ Indifferent □ No

10	What is your most concerned problem in this project? □Air □ Surface Water □ Groundwater □ Flora and Fauna Biodiversity □Solid Waste □Earth □Stench □ Loss of agricultural land
11	In your opinion, what is the effect to environment from this project construction? (Single Choice) □Positive Effect (better water supply, employment opportunities, more business activities, e.g.) □Negative Effect (Loss of Land, loss of greenery, displacement from home/livelihood □No Effect
	12 After the comprehensive consideration of the above, what is your attitude towards this project construction? If you are not in support, please explain your reason. (Single Choice) □Support □Indifferent □Do not support, reason
	What other specific requirements, suggestions and issues need to be clarified about the environmental protection in this project?
Note	Other comments and suggestions, as well as some specific requirements, can be expressed in writing. If necessary, a separate sheet of instructions is allowed.

Declaration: We will ensure the confidentiality of your personal information, and your answers will be used in the EIA report

Figure A6.3: Pictures of Public Consultation Meetings Conducted at the Project Counties (Cities) for February 2018

First round

LBECZ (Date: 2018.2.7)

Zhenkang (Date: 2018. 2. 8)


Cangyuan(Date: 2018.2. 9)

Figure A6.4: Pictures of Public Consultation Meetings Conducted at the Project Counties (Cities) for April 2018

Second Round

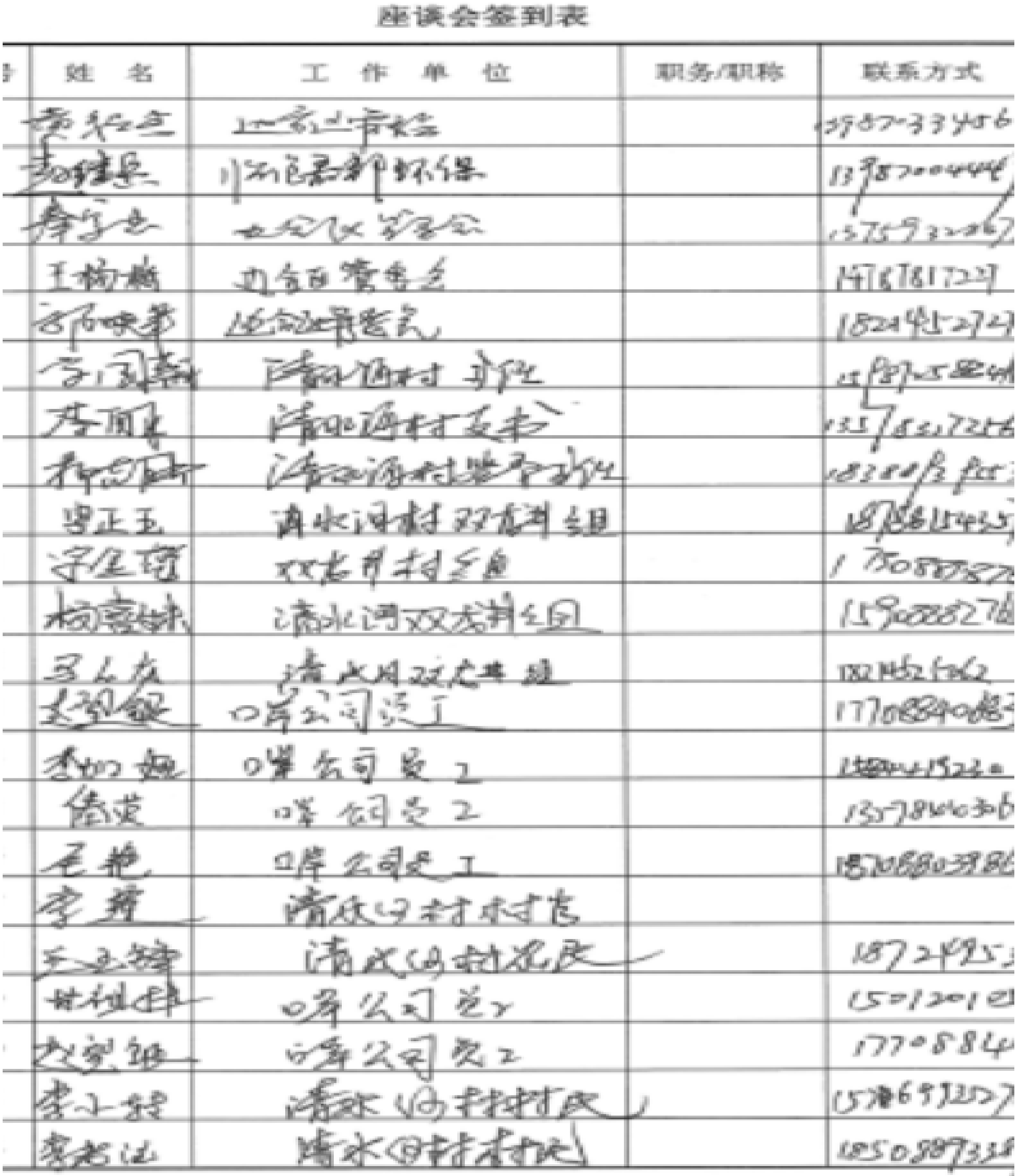

LBECZ (Date: 2018.4. 20)

Zhenkang (Date: 2018. 4. 24)

Cangyuan (Date: 2018.4. 25)

Source: PMO

Figure A6.5: Sign-up sheet showing name, gender, age, relationship with the project, and phone number For First Round of Consultations at Qingshuihe Location



座谈会签到表

号	姓名	工作单位	职务/职称	联系方式

First Round of Consultations at Zhenkang County

座谈会签到表

姓名	工作单位	职务/职称	联系方式
[illegible]	健康卫计局		1338836[illegible]
[illegible]	〃 〃 〃		15126564
[illegible]	君邦环保		137870044
[illegible]	地方卫生和计划生育局		13787033
[illegible]	[illegible]		182145272
[illegible]	功能区管委会		14787812
[illegible]	学生		15087819
罗[illegible]	教师		137592
[illegible]开[illegible]	新兰祥饭店	老板	13578304
[illegible]小仙	新兰祥饭店	~~[illegible]~~	15911844
[illegible]	园区[illegible]		182145
[illegible]	园区警务室		1572646
张[illegible]	园区警务室		
[illegible]	园区办公室		1530883
[illegible]	园区招商局		13578330
[illegible]	园区[illegible]		1398837
[illegible]	园区[illegible]		137593
李[illegible]	园区[illegible]		137593
[illegible]	[illegible]环境[illegible]		1391185

First Round of Consultations at Cangyuan County

座谈会签到表

序号	姓名	工作单位	职务/职称	联系方式
1	[illegible]	县教育局		13578429478
2	[illegible]	县教育局		(9486108008) 13578428186
3	[illegible]	[illegible]		13987033486
4	[illegible]	[illegible]		18214527279
5	[illegible]	[illegible]		13911852897
6	周梦瑶	云南工程职业学院		17608802720
7	肖燕	昭通学院		1577025230[illegible]
8	[illegible]	[illegible]		15817401539
9	[illegible]	[illegible]		[illegible]
10	李艳	[illegible]		13988359831
11	[illegible]	[illegible]		15906930720
12	[illegible]	[illegible]		15758681372
13	[illegible]	[illegible]		15923497796
14	[illegible]	[illegible]		13988353805
15	[illegible]	[illegible]		15208836155
16	周梦瑶	学生		17608820720
17				
18				
19				
20				
21				

Source: PMO

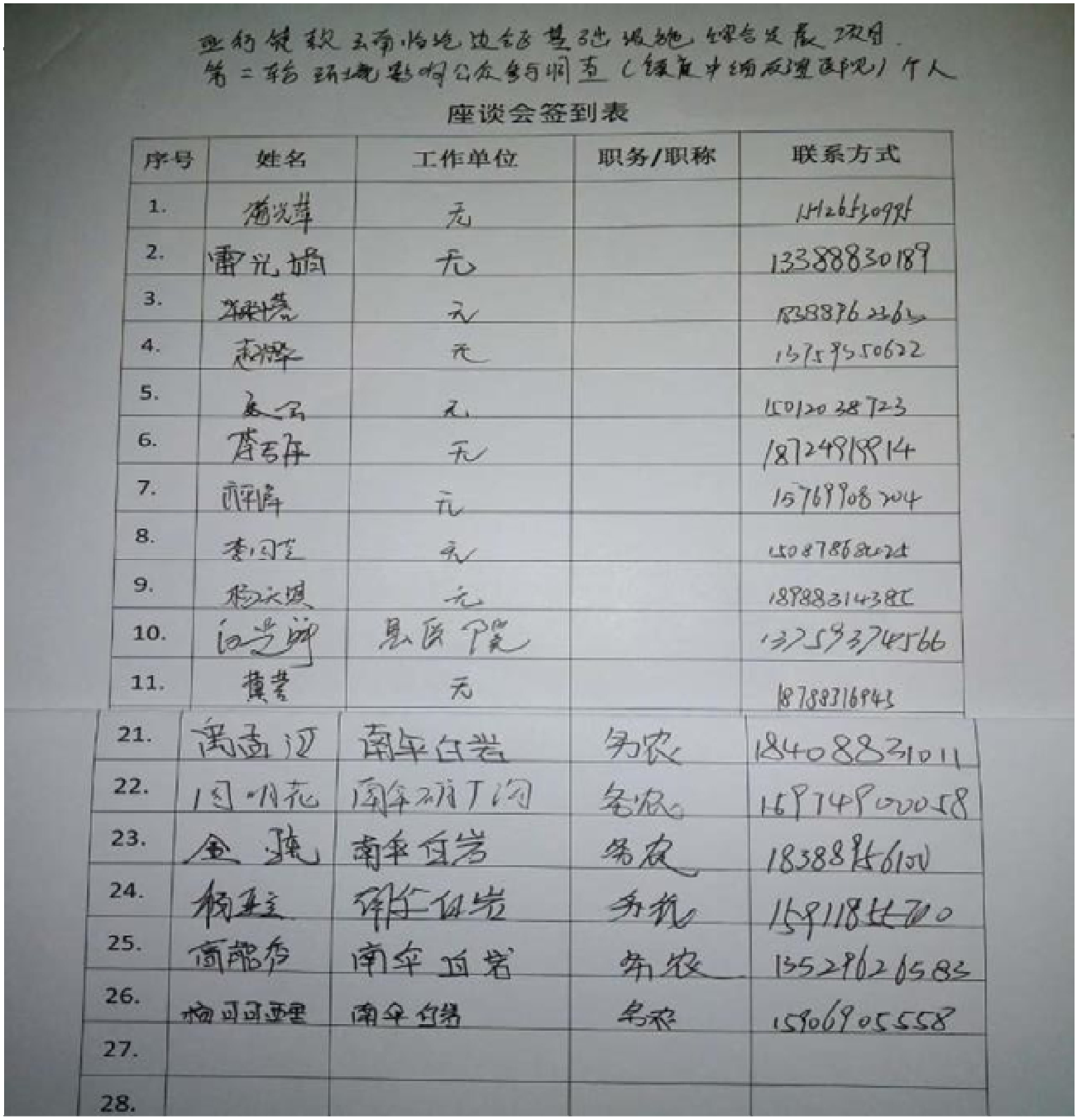
Second Round of Consultations at Qingshuihe

亚行贷款云南临沧边境经济合作区基础设施综合开发项目
第二轮环境影响公众参与调查（临沧清水河口岸片区）

座谈会签到表

序号	姓名	工作单位	职务/职称	联系方式
1.	杨树	务农		
2.	李宝刚	务农		
3.	周玉俊	服务		15208831826
4.	赵小明	服务		15974902455
5.	李志开	经商		18408801193
6.	陈海燕	个体		13988370907
7.	杨天才			18314986344
8.	宋太伟	农民		18214514517
9.	刘玉民	农民		15808838070
10.	鲁建余	务农		14769096720
11.	陈丹	农民		15035929665
12.	姚黎	口岸公司员工		
13.	李艳	口岸公司员工		18087754856
14.	字金彪	自由职业者		
15.	闫玉才	口岸公司员工		18187099212
16.	倪英	口岸公司员工		13578443066
17.	杨子煤	自由职业者		15758012240
18.	赵望远	职员		17708840683
19.	何永友			15808835282
20.	马云龙	口岸公司职工		18214525062

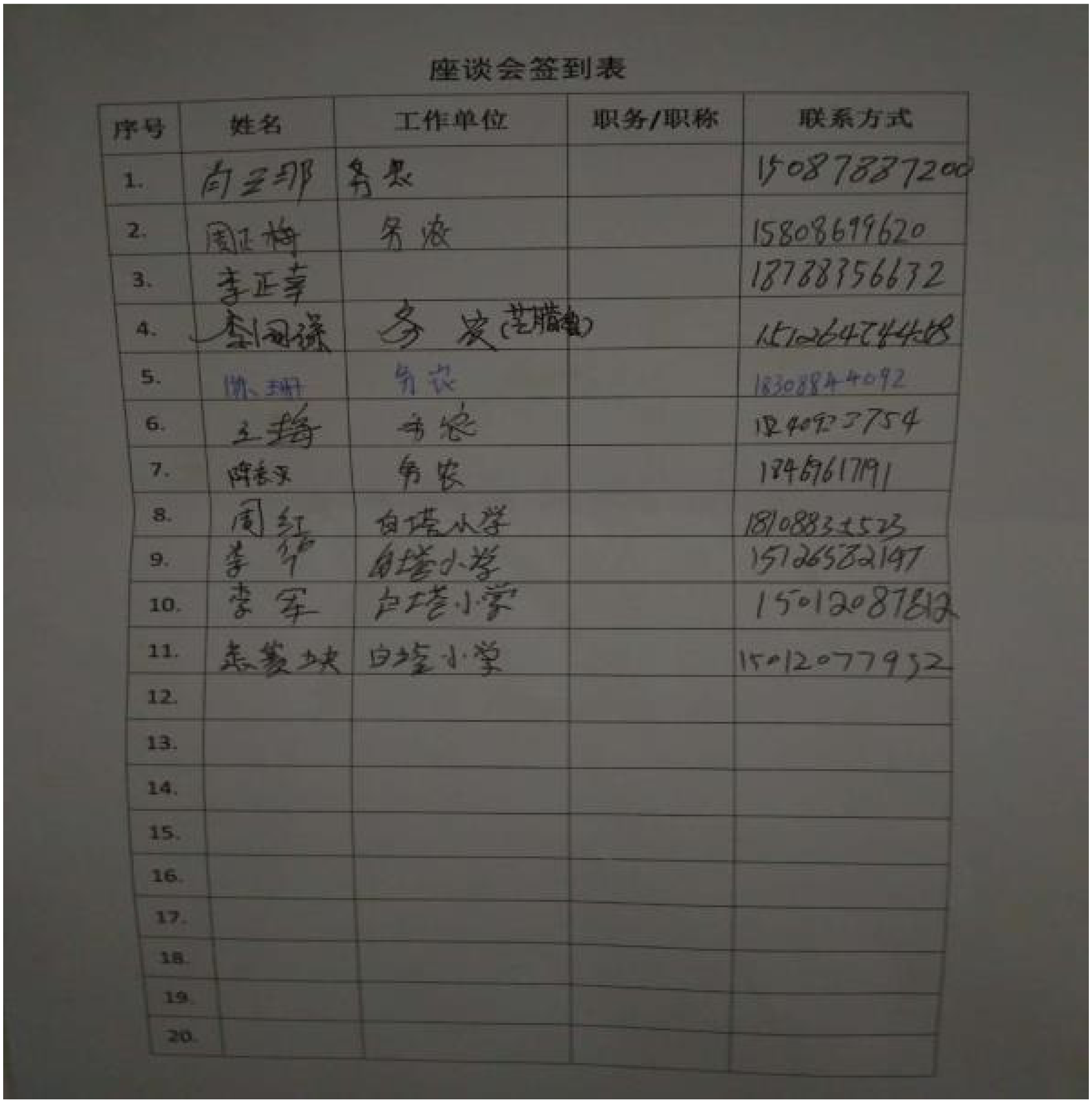
Second Round of Consultations at Zhenkang County



座谈会签到表

序号	姓名	工作单位	职务/职称	联系方式
1.	[illegible]	无		[illegible]
2.	[illegible]	无		13388830189
3.	[illegible]	无		[illegible]
4.	[illegible]	无		[illegible]
5.	[illegible]	无		[illegible]
6.	[illegible]	无		18724918914
7.	[illegible]	无		[illegible]
8.	[illegible]	无		[illegible]
9.	[illegible]	无		[illegible]
10.	[illegible]	县医院		[illegible]
11.	[illegible]	无		18788316943
21.	[illegible]	南伞白岩	务农	18408831011
22.	[illegible]	南伞班丁河	务农	[illegible]
23.	[illegible]	南伞白岩	务农	[illegible]
24.	[illegible]	南伞白岩	务农	[illegible]
25.	[illegible]	南伞白岩	务农	13529626583
26.	[illegible]	南伞白岩	务农	15906905558
27.				
28.				

Second Round of Consultations at Cangyuan County



座谈会签到表

序号	姓名	工作单位	职务/职称	联系方式
1.	向王邦	务农		15087887200
2.	周正梅	务农		15808619620
3.	李正学			18788356672
4.	李国强	务农（[illegible]）		[illegible]
5.	[illegible]	务农		18308844092
6.	王梅	务农		[illegible]3754
7.	[illegible]	务农		[illegible]
8.	周红	白塔小学		18108833523
9.	李华	白塔小学		15126582197
10.	李军	白塔小学		15012087812
11.	[illegible]	白塔小学		15012077932
12.				
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Annexure 7: Approval letter of EIA by Lincang Environmental Protection Agency (LEPA)

DOCUMENTS OF ENVIRONMENTAL PROTECTION AGENCY OF LINCANG CITY
LHS (2017) NO. 20

REPLY ON ENVIRONMENTAL IMPACT REPORT OF INFRASTRUCTURE CONSTRUCTION AND COMPREHENSIVE DEVELOPMENT PROJECT IN LINCANG ECONOMIC COOPERATION ZONE FROM ENVIRONMENTAL PROTECTION AGENCY OF LINCANG CITY

MANAGEMENT COMMITTEE OF LINCANG BORDER ECONOMIC COOPERATION ZONE:

WE HAVE RECEIVED THE ENVIRONMENTAL IMPACT REPORT OF INFRASTRUCTURE CONSTRUCTION AND COMPREHENSIVE DEVELOPMENT PROJECT IN YUNNAN LINCANG BORDER ECONOMIC COOPERATION ZONE (HEREINAFTER REFERRED TO AS THE "REPORT"). AFTER STUDY, THE REPLY IS AS FOLLOWS:

I. THE INTEGRATED INFRASTRUCTURE DEVELOPMENT PROJECT IN LINCANG BORDER ECONOMIC COOPERATION ZONE IS LOCATED IN GENGMA DAI AND VA AUTONOMOUS COUNTY, CANGYUAN VA AUTONOMOUS COUNTY AND ZHENKANG COUNTY OF LINCANG CITY, AND IT INCLUDES 17 SUBPROJECTS OF 5 CATEGORIES. AMONG THESE SUBPROJECTS, 4 ARE TOWN-LEVEL INFRASTRUCTURE PROJECTS, 2 ARE INDUSTRY PROJECTS, 5 ARE ENVIRONMENTAL RESOURCE PROJECTS, 4 ARE SOCIAL UNDERTAKING PROJECTS AND 1 IS CAPACITY BUILDING PROJECT (SEE THE LIST OF PROJECT COMPOSITION FOR DETAILS).

LIST OF PROJECT COMPOSITION

S/N	ITEM/TYPE	PROJECT NAME
1	4 TOWN-LEVEL INFRASTRUCTURE PROJECTS	SECONDARY MAIN ROAD PROJECT IN QINGSHUIHE RIVER PORT ECONOMIC ZONE
2		EXPANSION PROJECT OF CHINA-MYANMAR HIGHWAY (PHASE I)
3		MUNICIPAL MAIN ROAD PROJECT IN MENGDING QINGSHUIHE RIVER PORT ECONOMIC ZONE (PHASE II OF CHINA-MYANMAR HIGHWAY)
4		ROAD ACROSS NANTING RIVER AND CONNECTING MANGKA TOWN IN THE QINGSHUIHE RIVER PORT ECONOMIC ZONE
5	2 INDUSTRY PROJECTS	CONSTRUCTION PROJECT OF THE FRONTIER TRADING PLACE FOR BORDER PEOPLE AT LINCANG MENGDING QINGSHUIHE RIVER PORT
6		CONSTRUCTION PROJECT FOR INFRASTRUCTURE IN INTERNATIONAL CAPACITY COOPERATION AREA AT QINGSHUIHE RIVER
7	5 ENVIRONMENTAL	WATER SUPPLY PROJECT IN MENGDING QINGSHUIHE RIVER PORT AREA

8	RESOURCE PROJECTS	SEWAGE TREATMENT PLANT AND SUPPORTING PROJECTS IN MENGDING QINGSHUIHE RIVER PORT AREA
9		SOLID WASTE DISPOSAL PROJECT FOR MENGDING AREA AND QINGSHUIHE RIVER PORT AREA
10		**RIVER REGULATION AND LANDSCAPE WORKS WITHIN QINGSHUIHE RIVER PORT**
11		**SUPPORTING PROJECT FOR URBAN PUBLIC TRANSPORT INFRASTRUCTURE FROM MENGDING TO QINGSHUIHE RIVER**
13	4 SOCIAL UNDERTAKING PROJECTS	CONSTRUCTION PROJECT OF PORT HOSPITAL IN QINGSHUIHE RIVER PORT ECONOMIC ZONE OF MENGDING TOWN
14		CONSTRUCTION PROJECT FOR GUOMEN PRIMARY SCHOOL IN QINGSHUIHE RIVER AREA, MENGDING
15		GUOMEN NO. 2 PRIMARY SCHOOL CONSTRUCTION PROJECT OF CANGYUAN VA AUTONOMOUS COUNTY
16		CONSTRUCTION PROJECT OF CHINA-MYANMAR FRIENDSHIP HOSPITAL IN ZHENKANG COUNTY
17	1 CAPACITY BUILDING PROJECT	TRAINING, INVESTIGATION, CONSULTING IMPLEMENTATION, MANAGEMENT BOARD CONSTRUCTION

THE ABOVE PROJECTS ARE IN LINE WITH THE DEVELOPMENT PLANNING OF LINCANG BORDER ECONOMIC COOPERATION ZONE, THE POLICY OF HARMONIOUS DEVELOPMENT OF SOCIAL ECONOMY AND ENVIRONMENTAL PROTECTION AND RELEVANT ENVIRONMENTAL PROTECTION REQUIREMENTS, AND IMPLEMENTATION OF SUCH PROJECTS WILL PLAY A POSITIVE ROLE IN PROMOTING THE REGIONAL SOCIAL AND ECONOMIC DEVELOPMENT. WE HEREBY APPROVE THE CONSTRUCTION OF SUCH PROJECTS ACCORDING TO THE NATURE, SCALE, LOCATION AND ENVIRONMENTAL PROTECTION COUNTERMEASURES AS DESCRIBED IN THE REPORT.

II. KEY EMPHASIS IN PROJECT CONSTRUCTION:

(I) IMPLEMENT THE "THREE SIMULTANEITIES" FOR ENVIRONMENTAL PROTECTION STRICTLY, ENSURE THE PROPER PERFORMANCE OF ENVIRONMENTAL PROTECTION ENGINEERING MEASURES AND PROPER ARRANGEMENT OF FUNDS AND INCLUDE THE ENVIRONMENTAL PROTECTION ENGINEERING IN THE MAJOR CONTENTS OF PROJECT CONSTRUCTION.

(II) ENHANCE MANAGEMENT IN THE CONSTRUCTION PERIOD; REALIZE CAREFUL ORGANIZATION AND CIVILIZED CONSTRUCTION; TAKE POLLUTION CONTROL MEASURES FOR CONSTRUCTION NOISE AND

DUST; MINIMIZE AND ELIMINATE THE IMPACT OF ENGINEERING CONSTRUCTION ON THE ENVIRONMENT IN THE SURROUNDING AREA.

(III) FOCUS ON POLLUTION CONTROL OVER WASTE WATER AND MEDICAL WASTE OF THE HOSPITAL IN THE OPERATION PERIOD.

WE HEREBY DEMAND THE LAND, RESOURCES AND ENVIRONMENTAL PROTECTION BUREAU OF GENGMA DAI AND VA AUTONOMOUS COUNTY, LAND, RESOURCES AND ENVIRONMENTAL PROTECTION BUREAU OF CANGYUAN VA AUTONOMOUS COUNTY AND ENVIRONMENTAL PROTECTION AGENCY OF ZHENKANG COUNTY TO ENHANCE SITE SUPERVISION AND INSPECTION AND DO A GOOD JOB IN ENVIRONMENTAL MANAGEMENT IN THE CONSTRUCTION PERIOD.

LINCANG MUNICIPAL ENVIRONMENTAL PROTECTION BUREAU
JULY 14, 2017

COPY TO: LAND, RESOURCES AND ENVIRONMENTAL PROTECTION BUREAU OF GENGMA DAI AND VA AUTONOMOUS COUNTY; LAND, RESOURCES AND ENVIRONMENTAL PROTECTION BUREAU OF CANGYUAN VA AUTONOMOUS COUNTY; ENVIRONMENTAL PROTECTION AGENCY OF ZHENKANG COUNTY	
OFFICE OF ENVIRONMENTAL PROTECTION AGENCY OF LINCANG CITY	PRINTED AND DISTRIBUTED ON JULY 14, 2017

Annexure 8: Other consent Letters

A.	Approval for LBECZ by Lincang Municipal Development and Reform Commission	December 30, 2016
B	Approval for Fenquing Medical Facility by Lincang Municipal Government	2017
C	**Document of Lincang Municipal Environmental Protection Bureau**	March 5, 2018
D	Letter of approval for water resources	

Annexure 8.A. LBECZ Project Approval

Yunnan Provincial Development and Reform Commission
Foreign Fund Utilization Division [2016] 1930

Yunnan Provincial Development and Reform Commission's Approval of Project Proposal of ADB Financed Yunnan Lincang Cross-border Economic Cooperation Zone Infrastructure Comprehensive Development Project

Lincang Municipal Development and Reform Commission:

The Request for Approval of Project Proposal of ADB Financed Yunnan Lincang Cross-border Economic Cooperation Zone Infrastructure Comprehensive Development Project (No.936, 2016, Foreign Fund Division of Lincang Municipal Development and Reform Commission) and appendices have been received. ADB Financed Yunnan Lincang Cross-border Economic Cooperation Zone Infrastructure Comprehensive Development Project has been included into PRC's Project Planning for Utilizing Loans from International Financial Organizations 2016-2018 issued by NDRC and MOF in 2016. According to the Interim Management Measures for Investment Projects Financed by International Financial Organizations and Foreign Governments, NDRC's Notice on Further Strengthening the Management of Projects Financed by International Financial Organizations, and other relevant requirements, the Project Proposal has been reviewed and approved as follows:

I Project Rationale

Lincang Cross-border Economic Cooperation Zone (LBECZ) is a "Golden Gateway" for China to Connect with South Asia and Southeast Asia, and an important strategic node for China to reaching out to the Indian Ocean. Adjacent to Myanmar, its location provides it with rich natural resources and particular geographical advantages of becoming the most rapid route for the PRC to reach the Indian Ocean through Myanmar via Yunnan Province, presenting great development potentials. However, for a long time, poor municipal infrastructures development and social development has been constraining LBECZ's economic and social development and its further opening-up. ADB's support in its infrastructure development can effectively improve its infrastructure conditions and facilitate the social development, local resources development, industrial development and border trade in LBECZ, and has great implications for Yunnan Provincial to serve and join the country's "One Belt, One Road" Development Strategy, to accelerate the development of South Asia and Southeast Asia Radiating Center and promote international production capacity cooperation in border regions, and to improve development and opening-up of border minority regions.

II Project Scope

1. Project Location

LBECZ's Mengding Core Park in Gengma County (Qingshuihe Border-crossing Economic Zone), Nansan Park in Zhenkang County and Yonghe Park in Cangyuan County.

2. Project Components and Scale

The proposed project is consisting of 16 subprojects which fall into 5 categories.

i. Municipal Transport Infrastructure Development

(i) Municipal secondary main roads in Mengding Qingshuihe Border-Crossing Economic Zone, including 6 municipal secondary main roads with a total length of 5.95km.

(ii) Municipal main road in Mengding Qingshuihe Border-Crossing Economic Zone (Phase II of China-Myanmar Avenue), including 17.5m ROW widening for a 9.7km long municipal road.

(iii) China-Myanmar Avenue Phase 1 extension, mainly including combined motor and non-motorized vehicle lane, pedestrian road, greening, water and sewage networks, lighting, utility tunnel, and traffic facilities.

(iv) Nantinghe Bridge and connecting road to Mangka Border Crossing, including a 5.17km road along the north bank of Nantinghe River, starting from Qingshuihe transformer substation to connect with Guomen Road; Nantinghe No.1 Bridge, 400 meters in length and 50m in height.

ii. Social Infrastructure Development

(i) Guomen No. 2 Primary School in Cangyuan Wa Autonomous County. Planned Enrollment 1080 students, building area of 10995.28m^2; construction mainly includes: teaching building, multiple-use building, student dormitory, canteen, sports room, track and field, gymnasium, flag-raising Platform, parking lot, etc. and teaching equipment.

(ii) China-Myanmar Friendship Hospital in Zhenkang County, including a Class 2A general hospital with 500 inpatient beds, and a building area of 44588.46m^2, and medical equipment and device.

(iii) A border hospital in Qingshuihe Border-crossing Economic Zone. Planned land area is 50m, a Class 2A general hospital with 100 inpatient beds, and a building area of 9980m^2, and medical equipment and device.

(iv) A primary school in Qingshuihe. Building area 1360m^2; construction mainly includes canteen, student dormitory and track and field; and teaching equipment.

iii. Infrastructure for Industrial Development

(i) A border trade center at Qingshuihe Cross-border Point. Total land area is 300mu. Total building area is 120,000m^2, including: 95,000m^2 market sheds, 20,000m^2 warehousing and 5000m^2 offices.

(ii) Infrastructure of Qingshuihe International Production Capacity Cooperation Zone. A land area of 500m, with constructions of bulk commodity logistics zone, general warehousing and logistics zone, warehousing, workshop buildings for production and processing, and service buildings, with a total floor area of 100,000m^2; exterior components including access roads, parking lot, landscaping, etc.;

iv. Environmental Resources

(i) Water Supply in Qingshuihe. A water treatment plan with a capacity of 40,000m^3/d (short term, to be included in this project) (long term 80,000 m^3/d), and 89.13km transmission and distribution pipelines. Land area: 75mu.

(ii) Wastewater Treatment and associated works in Qingshuihe. A WWTP with a capacity of 25,000m^3/d (long term 50,000 m^3/d); and drainage pipelines of 48.47km. Land area: 2.38ha.

(iii) Solid waste management in Mengding and Qingshuihe areas, including 11 solid waste collection stations and 42 solid waste collection points (collection containers) in the main urban area of Mengding; and 2 solid waste collection stations in Qingshuihe.

(iv) Qingshuihe River rehabilitation and landscaping. Rehabilitation of 5km of Qingshuihe River.

(v) Urban public transport for Mengding-Qingshuihe. A land area of 10m; provision of 10 electric vehicle charging stations/LNG stations on the way from Mengding to Qingshuihe and Mangka area (3 in Qinghsuihe, 5 in Mengding and 2 in Mangka); and purchasing 15 new-energy buses.

v. Capacity Building

This component mainly includes training and study tours, project implementation consulting services and a management platform.

III Cost Estimate, Financing and Fund Allocations

i. Cost Estimate

The total estimated cost for the Project is CNY 3.058 billion yuan, including CNY 2.02 billion for civil works and installations, CNY 301.05 million for equipment, CNY 35.0 million for training and consulting services, CNY 427.14 million of other fees of construction, CNY 184.89 million of contingency, CNY 78.75 million of loan interest, and CNY11.60 million of commitment charges.

ii. Project Financing Plan

ADB will finance USD 250.0 million, or an equivalent of CNY 1.75 billion yuan, (USD to RMB exchange rate 1:7), accounting for 57.22% of total cost; CNY 1.3083 billion yuan will be financed by domestic counterpart funding, accounting for 42.78% of total, to be provided by the project implementing agencies.

iii. Fund Allocation of ADB Financing

(i) Infrastructure construction: USD 201.993 million, accounting for 80.80% of ADB financing;
(ii) Equipment purchase: USD 43.007 million, account for 17.2% of ADB financing;
(iii) Consulting and training: USD 5.0 million, accounting for 2% of the ADB financing.

IV Institutional Arrangements and Loan Repayment

The LBECZ Administrative Committee has established a Project Leading Group and a Project Construction Management Office, responsible for the construction and management of the Project. LBECZ Administrative Committee, Zhenkang County Government and Cangyuan County Government are the implementing agencies of the Project, responsible for repayment of the principal and interest of the ADB loan.

To ensure smooth project implementation by the schedule, the project IAs should be urged to conduct project preparations in a timely manner according to the project timetable, and further improve the project design basing on suggestions and comments from ADB and PPTA, and prepare project feasibility studies based on the project categorizations and submit to the Provincial Development and Reform Commission for Approval.

Yunnan Provincial Development and Reform Commission
December 30 2016

cc: Yunnan Provincial Finance Department, LBECZ Administrative Committee

Annexure 8.B. Medical Waste Approval Letter by Lincang Municipal Government

Document of Lincang Municipal Government
No. 2, 2017

Approval of Lincang Municipal Government on Constructing Liying Medical Waste Treatment Center in Fengqing County

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To the People's Government of Fengqing County,

The *Request for Approval of the* ***Construction of Liying Medical Waste Treatment Center in Fengqing County*** (No. 136, 2016) was well received, after review, the approval opinions are as follows:

I. In order to facilitate the improvement of the capacity in coordinated disposal of medical waste in the municipality, it is agreed to implement the construction of Liying Medical Waste Treatment Center in Fengqing County.

II. Following the principle of nearby centralized disposal of medical waste, it is agreed to include Yun County, Fengqing County, Yongde County and Zhenkang County into the service coverage scope of Liying Medical Waste Treatment Center in Fengqing County.

III. According to Article 22 of the *Regulation on the Management of Medical Waste*, "the entity which undertakes centralized disposal of medical waste shall apply to county level and above environmental protection authorities for operation license", after the construction completion of Liying Medical Waste Treatment Center in Fengqing County, one shall apply to county level and above environmental protection authorities for operation license prior to undertaking any operation activities.

Approval as above.

People's Government of Lincang Municipality

Annexure 8.C. Letter for Centralised Medical Waste by LEPB

Document of Lincang Municipal Environmental Protection Bureau
No. 38, 2018

Notice of Lincang Municipal Environmental Protection Bureau and Health and Family Planning Commission on Undertaking Proper Centralized Disposal of Medical Waste in the Municipality

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To Counties, Autonomous Counties and District Government:

According to the requirements of the *Regulation on Management of Medical Waste* (Decree No. 380 by State Council), the *Notice of National Health and Family Planning Commission and Ministry of Environmental Protection on Further Strengthening the Management of Medical Waste* (No. 45, 2013), the *Notice of Yunnan Provincial Health and Family Planning Commission and Yunnan Provincial Environmental Protection Department on Further Strengthening the Management of Medical Waste* (No. 155, 2016) and *Lincang's Medical Waste Management Methods* (trial), and considering the actual status that the **relocation and technological upgrade of Lincang Municipal Medical Waste Centralized Disposal Center** (treatment of 5 tons of infectious and injurious medical waste per day) has successfully put into operation, and that Lincang Jinsheng Medical Waste Disposal Company has acquired the operation license for medical waste centralized disposal, with an objective to ensure legal, safe and centralized disposal of medical waste from health and medical institutions in the whole municipality, the following arrangements are made on centralized disposal of medical waste as approved by the municipal government:

1. Starting from March 20th, 2018, all counties (district) shall stop the implementation of the transitional plan for disposal of medical waste, the infectious and injurious medical waste generated by all kinds of medical and health institutions in the municipality shall be transferred to Lincang Municipal Medical Waste Centralized Disposal Center for collection and disposal. Unlicensed entities shall not undertake collection, storage, transport and disposal of medical waste.

For remote rural areas without access to centralized disposal facilities, the local level medical and health institutes shall undertake on their own on-site disposal of the medical waste in accordance with the requirements of the *Methods on Management of Medical Waste from Medical and Health Institutions* (Decree No. 36, Ministry of Health) and under the guidance from authorities of health and family planning and environmental protection, and make proper registration and records. In addition, the following basic requirements shall be met: after used, the disposable medical appliances and injurious medical waste shall be immediately disinfected and destroyed; burnable waste shall be immediately burned; noncombustible waste shall be disposed in landfill after disinfection.

2. The People's Government of Fengqing County shall accelerate the construction of Liying Medical Waste Treatment Center in accordance with requirements of the approval document (No.2, 2017), to comprehensively improve the capacity in coordinated disposal of medical waste. Prior to project completion and licensing, no medical waste disposal activities shall be carried out.

3. County (district) health and family planning authorities shall urge the medical and health institutions to sign medical waste centralized disposal agreement with Lincang Jinding Medical Waste Disposal Company in a timely manner. Medical and health institutions who engage unlicensed entity or individuals for collection, transport, storage and disposal of medical waste shall bear legal consequences; The medical waste centralized disposal entity shall bear responsibilities in case there is pollution accident due to untimely collection, transport and disposal of medical waste as agreed.

4. Environmental protection and health departments of all levels shall strictly comply with the requirements of the *Notice of Yunnan Provincial Health and Family Planning Commission and Yunnan Provincial Environmental Protection Department on Further Strengthening the Management of Medical Waste* (No. 155, 2016), perform relevant responsibilities, and urge and guide the medical and health institutions and medical waste centralized disposal entities to establish and perfect accountability mechanism for management of medical waste, and conduct all-process management of medical waste centralized disposal, and develop rules and codes on safe disposal of medical waste, emergency response plan and supervision & inspection plans in accordance with relevant national requirements. Accountability mechanism shall be strictly implemented, illegal and incompliant behaviors shall be sanctioned by the law; suspected crime of illegal discharge, dumping and disposal of medical waste shall be reported to the police. The sorting, storage, collection, transport and disposal of medical waste shall be carried out in accordance with relevant national regulations.

临沧市环境保护局　　临沧市卫生和计划生育委员会

2018 年 3 月 5 日

Annexure 8.D. Agreement between Hydropower Company and Water supply company

Nanwa river power plant development and Meng Ding municipal water supply coordination agreement
Party A: Meng Ding Xinyuan water Industry Company
Party B: Lincang Yufeng Hydropower Development Co., Ltd.

In order to scientifically develop and utilize the water resources of the Nanwa River Basin, the Meng Ding Government invited Yucang Yufeng Hydropower Development Co., Ltd. to invest and develop an effective development of 130 million CNY and build up the three grade hydropower station (namely the Nanwa river power plant) with a total installed capacity of 20000KW. The project is planned to start in December 2008 and complete in June 2011.

Before the construction of the Nanwa river hydropower plant, the water resources of the Mengding water supply project, which was operated by Mengding Xinyuan water Industry Company, had been supplied by the water resources of the Nanwa River Basin. In order to ensure the resources sharing, harmonious and mutual development of the two projects of the hydropower station development and municipal water supply, two parties reached agreement under the coordination of Mengding town government. the details are shown as below:

1. Party A understands and supports Party B's hydropower development projects in Nanwa river. Party A and Party B, with the support of the Mengding government, will adjust the existing water price in accordance with the legal requiremetn as soon as possible. The documents required for adjusting the water supply price of Xinyuan water industry company shall be reported by Xinyuan water company, and the application documents of new sources of water supply shall be prepared and reported by Yuanfeng company, and the Mengding government shall be responsible for applying and coordinating the hearing to determine their price and price respectively.

2. Party A shall pay the water source fee to Party B in accordance with the water tariff of the Nangun river according to the tariff approved by local price bureau. The tariff shall be paid to Party B on a monthly basis by deducting 3% service charge based on the source water tariff. Party B must issue the official tax invoice to party A when the tariff is paid monthly. and. Party B shall bear the taxes.
3. During the development and construction of the Nanwa river power plant, Party B should ensure the safety of the existing Mengding municipal engineering. In order to solve the turbid pollution caused during the construction period and the shortage of water resources in the drought period, Party B shall excavate diversion canal through the Nangun river to the front pool of the three level station, and set up

the water source of the water in the Nangun river, and set up the water outlet near the front of the three level station and install the metering equipments. The water supply of the day is not less than 3000 cubic meters. In the future, the expansion of the city and the increase of water consumption in the city, Party B will increase the water supply, ensure the demand of the water intake of Party A, and Party B will be responsible for preparing application documents and water quality monitoring reports.

4. Party B shall be responsible for the construction of the water diversion channel behind the three level stations. Party A shall be responsible for the construction of the water supply network from the three level stations to the water supply plant. After the new water source start to be utilized, the original water intake canal shall be shut down.

5. After the completion of the power plant and water supply facilities, whether the hydropower development or the water supply facilities are built or reconstructed, the potential impact of the other party should be evaluated and the mitigation measures should be taken in advance, and the other party should be informed in writing. After receiving the notification, the other party should respond positively and unobstructed.

6. This agreement signing is witnessed by the Mengding government. The above content is true and effective. The breaching party shall bear legal liability.

7. Matters not covered by this Agreement shall be discussed separately by Party A and Party B. Deliberation and disagreement shall be resolved by coordination of the Mengding government.

8. This agreement is made in three copies. Each party holds one copy.

Representative of Party A

Representative of Party B

Witness: Mengding Government

Date of signing: December 24, 2008

Annexure 8.E. Approval on affairs related to solid waste clearance fee

Approval on affairs related to solid waste clearance fee from Development Planning Bureau, Gengma County

To Construction Bureau,

The Gengma Construction [2002] 42nd Post 'Request from County Construction Bureau on Changing Environmental and Sanitary Charging Items' from you has been received. After our validation and review, it is determined that the charging standard, required in the original Gengma Pricing [1994] 21st Post 'Notification on Adjusting the Environmental and Sanitary Charging Standard in Gengma County', is in accordance with the reality. However, because the civil construction and environmental protection sectors were separately divided, the original item title 'Environmental and Sanitary Maintenance' is inappropriate now. It shall be changed into 'Solid Waste Clearance Fee'. The detailed approvals on specific project standards are stated again as below:

1. The counting rate for the employees of agencies in county: 4 CNY/Person-Year;
2. The counting rate for the permanent stores and stalls (for groceries) along the street: 4 CNY/Month;
3. The counting rate for the permanent stores (for catering and repair industries): 8 CNY/Month;
4. The counting rate for temporary stalls such as long-lifetime community sheds: 0.4 CNY/Day;
5. The counting rate for operating stall based on the truck: 7 CNY/Car;
6. The counting rate for operating stall based on the tractor: 3 CNY/Car;
7. The counting rate for private houses along the street: 2 CNY/Month-Household;
8. The counting rate for the internal bins of agency: 2 CNY/Bin;

After your acceptance, please conduct the 'Charging Permission Changing Procedure' in time. Please implement the charging standard and the principle of 'separate treatment on income and expenditure' strictly. Please consciously accept the supervision of financial and pricing agencies. The original Gengma County Pricing [1994] 21st Post will be abolished correspondingly.

Approval statement again.

Annexure 8.F. Afforestation Plan of Gengma County

Office of the People's Government of Gengma Dai and Wa Autonomous County
(No.34, 2018)

Notice on 2018 Afforestation Plan of Gengma

To all township governments, Mengding and Mengsa Farm Management Committees, Overseas Chinese Administration Area, and relevant county agencies:

According to the Notice of Lincang Municipal Forestry Bureau on Assigning the Afforestation Tasks of 2018 (No.51, 2018), 80,000mu of afforestation shall be carried out in our county (including additional 50,000mu of Lincang Nut Trees, 20,000mu of general timber forest and 10,000mu of precious timber forest). Upon receipt of this document, the townships, farm management committees and Overseas Chinese Administration Area shall, in a timely manner, conduct investigations and break the afforestation areas/tasks down to the villages/communities, village groups, households and hilltops and land plots. In order to ensure proper and adequate implementation of the 2018 afforestation plan, the following tasks and requirements are set forth:

1. Tasks of Afforestation

Gengma Town 10,000mu, Mengding Town 9,000mu, Mengsa Town 10,700mu, Mengyong Town 13,000mu, Daxing Town 8,900mu, Mengjian Town 8,800mu, Hepa Town 6,500mu, Sipaishan Town 5,000mu, Manghong Town 5,500, Mengding Farm Management Committee 1,000mu, Mengsa Farm Management Committee 1,000mu, and overseas Chinese administration area 600mu.

2. Relevant Requirements

1) Integration of afforestation and poverty reduction. All townships, farm management committees and overseas Chinese administration area shall closely follow the targets for poverty reduction oriented ecological compensation, and make sure precise identification. During the planning and identification of land plots, the poor villages and poor households shall be given priority, so as to well integrate afforestation plan with poverty reduction oriented ecological compensation.

2) Integration of ecological development and industry development. All townships, farm management committees and overseas Chinese administration area shall include industrial development planning land plots, roads, riparian areas, maintains around urban areas, important water sources and other ecological areas into the afforestation plan, so as to achieve integration of ecological protection and forestry development.

3) Integration of afforestation greening and project implementation. All townships, farm management committees and overseas Chinese administration area shall carefully study and fully understand relevant national and provincial project regulations and requirements, strictly follow technical standards; those land plots that comply with relevant national and provincial project regulation and technical requirements can be included into the subsidy program, so as to effectively improve the quality of afforestation greening.

4) Timely submission of afforestation planning and plan. The afforestation plan for 2018 of the areas of respective jurisdictions shall be completed by March 25, 2018; the list of rural

households for afforestation and the table of afforestation plan shall be submitted to county forestry bureau by March 30, 2018; all submissions shall be provided in hard and soft copies, the hard copies shall have the signatures of the forestry station chief and the officer-in-charge, and the official stamp of the township government. Contact person: Liu Juan, tele: 13988376119. Email address: gmlyylz@163.com.

5) Progress reporting and corrective actions. All townships, farm management committees and overseas Chinese administration area shall assign focal point for afforestation greening, and strictly comply with weekly afforestation reporting system to report progress in a timely manner, and coordinate and address any issues occurred. Self-inspection and examination shall be conducted upon completion of afforestation tasks, and provide rapid correction of any existing issues, to ensure afforestation quality. All townships, farm management committees and overseas Chinese administration area shall submit the list of focal points and contact number by March 20, 2018.

Annex: 1. Itemized Tasks of the 2018 Afforestation Plan of Gengma County
Annex: 2. Township (farm) plantation plan 2018

Office of the People's Government of Gengma Dai and Wa Autonomous County
March 17, 2018

Annex 1

2018 Afforestation Plan of Gengma

Townships	***Total***	***Macadimia Nut***	***Subtotal***	***Additional plantation of Trees***	
				General Timber Forest	***Precious Timber Forest***
Gengma County	8	5	3	2	1
Gengma Town	1	0.7	0.3	0.2	0.1
Mengding Town	0.9	0.5	0.4	0.3	0.1
Mengsa Town	1.07	0.57	0.5	0.3	0.2
Mengyong Town	1.3	1	0.3	0.2	0.1
Daxing Town	0.89	0.49	0.4	0.2	0.2
Mengjian Town	0.88	0.63	0.25	0.15	0.1
Hepai Town	0.65	0.4	0.25	0.15	0.1
Sipaishan Town	0.5	0.25	0.25	0.25	
Manghong Town	0.55	0.2	0.35	0.25	0.1
Mengding Farm Management Committee	0.1	0.1	0		
Overseas Chinese Administration Area	0.06	0.06	0		
Mengsa Farm Management Committee	0.1	0.1	0		

Annex 2

XX Township (Farm) Plantation Plan of 2018 (Unit 10,000mu)

Unit (Stamp)

Village Group	**Total**	**Macadimia Nut**	**Precious Timber Forest**					**General Timber Forest**			
			Subtotal	**Taxus chinensis**	**Alnus**	**Betulaalnoides**	**Other species**	**Subtotal**	**Chinese fir**	**Eucalyptus**	**Other species**

Reviewed by: Filled in by: Date:

Annexure 9: Integrated Biodiversity Assessment Tool

Proximity report generated by the Integrated Biodiversity Assessment Tool

Site name	Nanding river-dec2016-SS
Latitude/Longitude	23° 30' 21" North, 98° 56' 10" East
Date generated	23rd December 2016
Generated by	asiandb
Company	ADB

About this report

This report presents the results of a proximity analysis to identify the biodiversity features and species which are located within 5 km, 10 km and 15 km.

Data used to generate this report

IUCN and UNEP-WCMC, 2016. *The World Database on Protected Areas (WDPA) [On-line], March 2016.*

BirdLife International (on behalf of the KBA Partnership), 2016. *Key Biodiversity Areas: December 2016 version.*

IUCN, 2014. *The IUCN Red List of Threatened Species grid analysis of range maps for threatened, near threatened and data deficient species. Version 2014.3.*

Limitations

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns, and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorising investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a “first-step”, providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.

For ultimate accuracy, distance calculations are performed by reprojecting the spatial data (as shown through the map viewer) to an equal distance projection, and so may not match precisely the results shown on the map.

Protected Areas and Key Biodiversity Areas

The following sites are found within the selected buffer distances:

Features within 5 km

There are no features within 5 km.

Features within 10 km

There are no features within 10 km.

Features within 15 km

There are no features within 15 km.

IUCN RED LIST OF THREATENED SPECIES

Given suitable habitat, the following species are potentially found close to the area of interest:

Taxonomic group	Scientific Name	Common Name	IUCN Red List category
Amphibians	Nanorana feae		DD
Amphibians	Nanorana yunnanensis	Yunnan Spiny Frog	EN
Amphibians	Odorrana grahami	Yunnanfu Frog	NT
Amphibians	Odorrana jingdongensis		VU
Amphibians	Tylototriton shanjing		NT
Birds	Alcedo hercules	Blyth's Kingfisher	NT
Birds	Anorrhinus austeni	Austen's Brown Hornbill	NT
Birds	Aquila heliaca	Eastern Imperial Eagle	VU
Birds	Aythya baeri	Baer's Pochard	CR
Birds	Aythya nyroca	Ferruginous Duck	NT
Birds	Buceros bicornis	Great Hornbill	NT
Birds	Clanga clanga	Greater Spotted Eagle	VU
Birds	Coturnix japonica	Japanese Quail	NT
Birds	Emberiza aureola	Yellow-breasted Bunting	EN
Birds	Esacus recurvirostris	Great Thick-knee	NT
Birds	Gallinago nemoricola	Wood Snipe	VU
Birds	Gyps bengalensis	White-rumped Vulture	CR
Birds	Haliaeetus leucoryphus	Pallas's Fish-eagle	VU
Birds	Mareca falcata	Falcated Duck	NT
Birds	Numenius arquata	Eurasian Curlew	NT
Birds	Pavo muticus	Green Peafowl	EN
Birds	Psittacula alexandri	Red-breasted Parakeet	NT
Birds	Psittacula finschii	Grey-headed Parakeet	NT
Birds	Psittacula roseata	Blossom-headed Parakeet	NT
Birds	Sarcogyps calvus	Red-headed Vulture	CR
Birds	Sitta formosa	Beautiful Nuthatch	VU
Birds	Sitta magna	Giant Nuthatch	EN
Birds	Sphenocichla roberti	Chevron-breasted Babbler	NT
Birds	Sterna aurantia	River Tern	NT
Birds	Syrmaticus humiae	Mrs Hume's Pheasant	NT
Birds	Treron phayrei	Ashy-headed Green-pigeon	NT
Birds	Vanellus duvaucelii	River Lapwing	NT
Bivalves	Inversidens pantoensis		DD
Fishes	Poropuntius opisthoptera		DD
Fishes	Rhinogobius brunneus	Amur Goby	DD
Mammals	Aonyx cinerea	Asian Small-clawed Otter	VU
Mammals	Arctictis binturong	Binturong	VU
Mammals	Arctonyx collaris	Hog Badger	NT
Mammals	Bos gaurus	Gaur	VU
Mammals	Capricornis milneedwardsii	Southwest China Serow	NT
Mammals	Cuon alpinus	Dhole	EN

Taxonomic group	Scientific Name	Common Name	IUCN Red List category
Mammals	Elaphodus cephalophus	Tufted Deer	NT
Mammals	Elephas maximus	Asian Elephant	EN
Mammals	Hylobates lar	Lar Gibbon	EN
Mammals	Lutra lutra	Eurasian Otter	NT
Mammals	Lutrogale perspicillata	Smooth-coated Otter	VU
Mammals	Macaca arctoides	Stump-tailed Macaque	VU
Mammals	Macaca assamensis	Assam Macaque	NT
Mammals	Macaca leonina	Northern Pig-tailed Macaque	VU
Mammals	Manis pentadactyla	Chinese Pangolin	CR
Mammals	Melogale personata	Large-toothed Ferret Badger	DD
Mammals	Naemorhedus griseus	Chinese Goral	VU
Mammals	Nomascus concolor	Black Crested Gibbon	CR
Mammals	Nycticebus bengalensis	Bengal Slow Loris	VU
Mammals	Panthera pardus	Leopard	NT
Mammals	Ratufa bicolor	Black Giant Squirrel	NT
Mammals	Rusa unicolor	Sambar	VU
Mammals	Trachypithecus phayrei	Phayre	EN
Mammals	Ursus thibetanus	Asiatic Black Bear	VU
Mammals	Viverra megaspila	Large-spotted Civet	VU
Mammals	Viverra zibetha	Large Indian Civet	NT
Plants	Magnolia henryi		DD
Plants	Magnolia hookeri	Angkang White Magnolia	DD
Reptiles	Ophiophagus hannah	King Cobra	VU
Reptiles	Python bivittatus	Burmese Python	VU
Snails and Slugs	Hubendickia chinensis		DD
Snails and Slugs	Lithoglyphopsis grandis		DD
Snails and Slugs	Salinator sanchezi		DD
Snails and Slugs	Tricula fuchsi		DD

About IBAT

The Integrated Biodiversity Assessment Tool (IBAT) provides key decision-makers with access to critical information on biodiversity priority sites to inform risk management and decision-making processes that address potential biodiversity impacts. Developed through a partnership of BirdLife International, Conservation International, International Union for Conservation of Nature (IUCN) and United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), the vision of IBAT is that decisions affecting critical natural habitats are informed by the best scientific information and in turn decision makers will support the quest to collect and enhance the underlying datasets and maintain that scientific information.

Nangunhe National Reserve

Country/territory: China (mainland)
IBA Criteria met: A1, A3 (2009)
Area: 20,567 ha
Protection status:

BirdLife China Programme

Most recent IBA monitoring assessment			
Year of assessment	Threat score (pressure)	Condition score (state)	Action score (response)
2008	low	not assessed	medium

Site description
Located in the central part of the China-Myanmar border. The northern, eastern and western sections of the IBA are mountainous, and are in the southern extension of the Nu Shan mountain ranges. The Nangun He river flows through the nature reserve. The abandoned grassland in the IBA is used by foraging Elephas maximus and Cervus unicolor. The higher-elevation forests are home to primates, including Hylobates lar.

Key biodiversity
Non-bird biodiversity: Nationally protected plants include Tetrameles nudiflora, Gmelina arborea and Alsophila spinulosa. Animals include Panthera tigris corbetti, Panthera pardus, Neofelis nebulosa, Elephas maximus, Presbytis phayrei, Nycticebus coucang and Hylobates lar.
Year of compilation: 2009

Site description

Located in the central part of the China-Myanmar border. The northern, eastern and western sections of the IBA are mountainous, and are in the southern extension of the Nu Shan mountain ranges. The Nangun He River flows through the nature reserve. The abandoned grassland in the IBA is used by foraging Elephas maximus and Cervus unicolor. The higher-elevation forests are home to primates, including Hylobates lar.

Key biodiversity
Non-bird biodiversity: Nationally protected plants include Tetrameles nudiflora, Gmelina arborea and Alsophila spinulosa. Animals include Panthera tigris corbetti, Panthera pardus, Neofelis nebulosa, Elephas maximus, Presbytis phayrei, Nycticebus coucang and Hylobates lar.

Conservation responses/actions for key biodiversity

Established as Nangun He National Nature Reserve (7,083 ha) in 1980. However, the area of the reserve is too small and most of the protected species occur outside the reserve boundary.

IBA Criteria

Year of most recent IBA criteria assessment: 2009
Populations of IBA trigger species

Species	Current IUCN Red List Category	Season	Year(s) of estimate	Population estimate	IBA Criteria Triggered

Green Peafowl Pavo muticus	EN	resident	1992	6 individuals	A1

Note: This table presents the IBA criteria triggered and the species that triggered then at the time of assessment, the current IUCN Red List category may vary from that which was in place at that time.

IBA Monitoring

Most recent IBA monitoring assessment			
Year of assessment	Threat score (pressure)	Condition score (state)	Action score (response)
2008	low	not assessed	medium
Was the whole site covered?	No	State assessed by	unset
Accuracy of information	good		

Threats to the site (pressure)					
Threat Level 1	Threat Level 2	Timing	Scope	Severity	Result
Biological resource use	gathering terrestrial plants - unintentional effects (species being assessed is not the target)	likely in long term (beyond 4 years)	small area/few individuals (<10%)	slow but significant deterioration	low
Biological resource use	hunting & collecting terrestrial animals - intentional use (species being assessed is the target)	likely in long term (beyond 4 years)	small area/few individuals (<10%)	slow but significant deterioration	low
Human intrusions and disturbance	recreational activities	likely in long term (beyond 4 years)	small area/few individuals (<10%)	slow but significant deterioration	low

Conservation actions taken at site (response)			
Conservation Designation	Management Planning	Conservation Action	Result
Most of site (50-90%) covered (including the most critical parts for important bird species)	A management plan exists but it is out of date or not comprehensive	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	medium

IBA Protection Status

Protected Area	Designation	Area (ha)	Relationship with IBA	Overlap with IBA (ha)
Nangunhe	Nature Reserve	50,887	protected area contains site	20,567

Habitats

IUCN Habitat	Habitat detail	Extent (% of site)
Forest		-
Shrubland		-

Annexure 10: Water Intake Permit

Approval of Lincang Municipal Water Affairs Bureau on the Water Intake Permit Application of Mengding Qingshuihe Port Area Water Supply System

No.6 Document, April 27, 2018

After reviewing the Water Permit Application for Mengding Qingshuihe Port Area's water supply system submitted by Lincang Border Economic Cooperation Zone Administrative Committee, and the Report on Water Resources for Mengding Qingshuihe Port Area's Water Supply System prepared by Lincang Runting Water Sources Technology Co., Ltd, the expert group have provided the following review comments. After study and review, our bureau agrees with the water permit application of Mengding Qingshuihe Port Area Water Supply System, the approval is as follows:

I. Mengding Qingshuihe Port Water Supply System (the Project) is to develop water resource infrastructures to address water demands of the residents in Qingshuihe Port Area. The project is of great significance to address water drinking issue of the residents, optimized allocation of water sources and ensuring sustainable local social and economic development.

II. The water source of the project is Nangun River (short term) and Yunjing Reservoir (long term); the water supply capacity: short term (2020) 21000m^3/d, design annual water intake 7.665 million m^3; long term (2030), 63000m^3/d, design annual water intake 22.995 million m^3.

III. Water utilization is agreed for the project, provided that the ecological flow is ensured (ecological flow for the downstream Jianshui river section is determined as 10% of the water flow above cross-section of the intake dam at the design year (same period), the minimum discharge at water intake dam of Nangun River is 0.142m^3/s, the ecological water use is 4.372 million m^3. The project is designed to address difficulty in drinking water of the 79000 population of Mengding Qingshuihe Port Area, the design water supply is 22.995m^3.

IV. Provided that the minimum discharge of river channel is ensured, the water source should prioritize the drinking water demands of the people and animals downstream. The current water quality at the river section (the water intake of the project) is Grade II, which can meet the water quality requirements of the project.

V. Project drainage includes wastewater from construction and wastewater during operation. In which, the wastewater from construction including production refuse and sewage and domestic wastewater, the drainage is 988m^3, which will be recycled, instead of discharge to the outside; wastewater during operation includes refuse from water treatment, domestic wastewater of the workers and wastewater from the water supply zone. Annual wastewater generation from water treatment in the short term and long term is 383,300m3 and 1,149,800m^3; annual domestic wastewater generation is 819m^3; the wastewater drainage from water supply zone in the short term and long term is 4.0332 million m^3 and 12.4092m^3; the wastewater from water treatment after sedimentation will be discharged together with domestic wastewater and wastewater from water supply zone into municipal wastewater network.

VI. Your entity should strengthen water resource protection and water management at the water supply zone, establish water saving systems, adopt, as appropriate, new water saving technologies, improve water efficiency; the water consumption at water supply zone shall be controlled within the water consumption quota; the drainage shall be treated up to standard before discharge to minimize environmental impacts.

VII. Your entity should install water intake meter that complies with relevant national technical and quality standards, the meter shall be designed, installed and operational in parallel with the project facilities; after the meter is put into use, qualified agency shall be engaged to conduct regular calibration to ensure proper function and accuracy of the metering; install data transmission device to ensure data on water intake and drainage is transmitted to national water resource management system.

VIII. Your entity shall report to the bureau of project implementation progress. After project completion and 30 days commissioning, your entity shall apply to the bureau for issuing the water permit and submit documents on acceptance of the water intake. In Accordance with relevant regulations and requirements, the bureau will organize site examination and verification on the water intake facility, and issue water permit after acceptance, then the facility can officially take water and become operational.

IX. In special cases, your entity shall follow the decision of the bureau and relevant local authorities on water intake restrictions.

X. In case of changes in the water intake location, intake amount, intake purpose and intake methods, your entity shall re-apply for water intake.

If the project doesn't acquire authorization by relevant authorities tithin 3 years after approval of water intake permit, this approval document will automatically become invalid.

Appendix: (not attached to EIA)
1: Expert review comments on the Report of Water Resource for Mengding Qingshuihe Port Area Water Supply System;

2: Water intake permit application for Mengding Qingshuihe Port Area water supply system.

Annexure 11: GHG Computation Methodology

Yunnan Lincang Border Economic Cooperation Zone Development Project

1. Methodology of GHG computation for deforestation

The approved consolidated afforestation and reforestation baseline methodology ARACM0002/ Version 01, Sectoral Scope: 14, EB 46 have been used to determine the baseline emissions and emission reduction due to the reforestation CDM project activity. The title of this baseline methodology is "Afforestation or reforestation of degraded land without displacement of pre-project activities"

The methodology also refers to the latest approved versions of the following tools:

- Procedures to demonstrate the eligibility of lands for afforestation and reforestation CDM project activities (Version 01, Annex 18 of EB 35);
- Combined tool to identify the baseline scenario and demonstrate the additionality in A/R CDM project activities (Version 01, Annex 19 of EB 35);
- Tool for the identification of degraded or degrading lands for consideration in implementing A/R CDM project activities (Version 01, Annex 15 of EB 41);
- Tool for estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of an A/R CDM project activity (Version 02, Annex 35 of EB 42)

Therefore the baseline net GHG removals by sinks will be determined as:

$$\Delta C_{BSL} = \Delta C_{BSL,tree}$$

Where:

ΔC_{BSL} - Baseline net greenhouse gas removals by sinks; tCO_2-e

$\Delta C_{BSL,tree}$ - Sum of changes in carbon stocks in above-ground and below-ground biomass of trees in the baseline; tCO_2-e

For strata with no growing trees, $\Delta C_{BSL} = 0$. For strata with a few growing trees, ΔC_{BSL} is estimated using following equations.

$$\Delta C_{BSL,tree,i} = \sum_{t=1}^{t^*} \Delta C_{BSL,AG/BG,i,t} * \frac{44}{12} * 1year$$

Where;

$\Delta C_{BSL,tree,i}$ - Sum of the baseline annual changes in carbon stocks in above-ground and below-ground tree biomass for stratum *i*: tCO_2-e

$\Delta C_{BSL,AG/BG,i,t}$ - Baseline annual net change in carbon stock in above-ground and below-ground tree biomass for stratum *i*, for year *t*: tCO_2-e

i - *1, 2, 3, M_B* strata in the baseline scenario

t - *1, 2, 3, t^** years elapsed since the start of the AR-CDM project activity

44/12 - Ration of molecular weight of CO_2 to carbon; tCO_2-e

The $\Delta C_{BSL,AG/BG,i,t}$ was estimated using Carbon gain-loss method.

$$\Delta C_{BSL,AG/BG,i,t} = \Delta C_{G,i,t} - \Delta C_{L,i,t}$$

$\Delta C_{BSL,AG/BG,i,t}$ - Baseline annual net change in carbon stocks in above-ground and below-ground tree biomass for stratum *i*, for year *t*; t C year^{-1}

$\Delta C_{G,i,t}$ - Annual increase in above-ground and below-ground carbon due to biomass growth of living trees in stratum *i*, for year *t*; t C year^{-1}
Note: This is the "potential growth" which is greater than the "observed growth", i.e., $\Delta C_{BSL,AG/BG,i,t}$, by $\Delta C_{L,i,t}$.

$\Delta C_{L,i,t}$ - Annual decrease in above-ground and below-ground carbon stock of living trees due to tree biomass loss for stratum *i*, for year *t*; t C year^{-1}
Note: Conservative assumption that $\Delta C_{L,i,t} = 0$ is allowed for the baseline scenario.

i - *1, 2, 3,* M_B strata in the baseline scenario

t - *1, 2, 3,* *t** years elapsed since the start of the AR CDM project activity

$$\Delta C_{G,i,t} = A_{BSL,i} * \sum_{j=1}^{J} G_{tree,j,i,t} * CF_j$$

Where;

$\Delta C_{G,i,t}$ - Annual increase in carbon due to biomass growth of living trees in stratum *i*, for year *t*; t C year^{-1}

$A_{BSL,i}$ - Area of baseline stratum *i*; ha

$G_{tree,j,i,t}$ - Annual increment of total above-ground and below-ground dry biomass of living trees of species *j* in stratum *i*, for year *t*; t d.m. ha^{-1} year^{-1}

CF_j - Carbon fraction of dry matter for species *j*; t C t^{-1} d.m.

i - *1, 2, 3,* M_B strata in the baseline scenario

j - *1, 2, 3, ... J* tree species in the baseline scenario

t - *1, 2, 3,* *t** years elapsed since the start of the AR CDM project activity

$$G_{tree,j,i,t} = G_{w,j,i,t} * (1 + R_j)$$

$$G_{w,j,i,t} = I_{V,j,i,t} * D_j * BEF_{1,j}$$

Where;

$G_{tree,j,i,t}$ - Annual increment of total above-ground and below-ground dry biomass of living trees of species *j* in stratum *i*, for year *t*; t d.m. ha^{-1} year^{-1}

$G_{w,j,i,t}$ - Average annual above-ground dry biomass increment of living trees of species *j* in stratum *i*, for year *t*; t d.m. ha^{-1} year^{-1}

R_j - Root-shoot ratio appropriate for biomass increment for species *j*; t d.m. t^{-1} d.m

$I_{V,j,i,t}$ - Current annual increment in stem volume of species *j* in stratum *i*, year *t*; m^3 ha^{-1} year^{-1}

Note: $I_{V,j,i,t}$ can be estimated as a constant annual average value over a period including the year *t* (Periodical Annual Increment).
Note: *t* is likely to be different than age of individual trees in the year *t*.

D_j - Basic wood density for species *j*; t d.m. m^{-3}

Experiential value for Chinese rubber project:

1 ton rubber wood = 0.85 ton carbon sink

Average Volume of rubber trees in Lincang:

Average Perimeter = 35 cm
Average Height = 15 m (value conservative)

Average Rubber Density =650KG/m^3
Volume per tree: V = height * $radius^2$ * π
= 15 * 0.1225 * 3.1415926
= 5.77 m^3
Carbon sink per tree: 5.77 m^3 * 0.65 ton/m^3 * 0.85 ton carbon sink = 3.19 $etco_2$

Number of rubber trees: 53000

Total carbon sink: 3.19 etco2 * 36000 = 169,070 $etco_2$

Renewal period: 10 years

Carbon sink loss per year: 169，070/10 = 16,907 $etco_2$

Rubber liquid production: 400 KG per year per tree
Estimation 50% water content
Carbons sink per tree concerning rubber liquid = 0.4 * 0.5 * 0.85 = 0.17 $etCo_2$
Total Carbons sink concerning rubber liquid per year = 6,120 $etco_2$

In project scenario: No fertilizer emission. (Need to calculate emission reduction in detail but small negligible value).

Summary: Carbon sink loss per year = 16,907 + 6,120 = 23,027 $etco_2$

2. Methodology of GHG computation for facilities of wastewater treatment

Wastewater treated by Output 1: 1,433 + 336 = 1,769 m^3/day = 645685 m^3/year
Wastewater treated by Output 2: 23,000 m^3/day = 8395000 m^3/year
Total: 9,040,685 m^3/year

CDM Methodology AM 0080

Baseline emissions on account of anaerobic decomposition of the waste water in the open lagoon
$BECH4,ww,y$ $BECH4,ww,y$ = GWPCH4 x Bo x $CODBL,ww,y$ x Qm,y,ww x $MCFBL,ww,y$

Project Emission in the year y PEy
PEy= $PECH4,ww,y$ + $PECH4,fugitive,y$ + $PEN2O,sl,y$ + $PEEL,y$ + $PEFC,y$ + $PETR,sl,y$

Experiencial value from the only approved CDM project in wastewater industry (Proposed to UNFCCC by Carbonium):

Baseline emission 0.00422 tCO_2 e / ton wastewater in baseline
Project emission without CH4 capture and cogeneration: 0.000681
Project emission with CH4 capture and cogeneration: 0.000503 tCO2 e / ton wastewater in project
(Each ton of wastewater produce 0.227 Kwh Qingdao Maidao Pilot Plant)

In the case of this project: Emission Reduction = (Baseline emission 0.00422 tCO_2 e / ton - Project emission without CH4 capture and cogeneration (A2O) : 0.000681 tCO_2 e / ton) * 9040685 m^3/year = -**31,990 tCO_2 e / year**

3. Methodology of GHG computation for transportation

The energy input and output of Lincang New Energy Supply station is 1.028:1 (FSR). The project construction is considered as carbon neutral.

The FSR also states that 7619 ton petroleum would be saved by the project per year (at the moment 2020).

Petroleum saved per year: 7,619 ton
According to British Petrol calculation methodology for China: 1 ton petroleum consumption = 3.15 tCO_2e

Emission Reduction = - **23,999 tCO_2 e / year**

4. Methodology of GHG computation for waste treatment

Waste treated by Output 2: 185 ton/day = 67,525 ton/year

Methodology: UNFCCC ACM 0001

According to ACM 0001 equation, experiential value of each tonne of MSW decomposed in anaerobic environment produces 0.0024 tonnes of methane = 0.0504 tCO2 e.

Emission Reduction = **- 3,403 tCO2 e / year**

5. Methodology of GHG computation for building construction

Building constructed by Output 1: 171633+ 107454m^2 = 279087 m^2
Building constructed by Output 2: 85839 m^2

Total Building Constructed = 364926 m^2

Methodology: Shanghai Institute of Technology <<Computation of carbon emission unit value of public buildings>> Yunnan Experiential Value: 198 kg CO_2e / m^2 year = 0.198 t CO_2 e / m^2 year.

Project Emission = 364926 * 0.198 t CO2 e / m^2 year = **72,255 t CO_2 e / m^2 year**

Summary:

Deforestation: = **23,027 eTCO_2** Carbon sink loss
Facilities of wastewater treatment = **- 31,990 eTCO_2** Emission Reduction
Transportation = **- 23,999 eTCO_2** Emission Reduction
Waste treatment = **- 3,403 eTCO_2** Emission Reduction
Building construction = **72,255 eTCO_2 Emission**

Annual Carbon Emission Balance: 35,890 eTCO_2 Emission Increase

APPENDIXES

Appendix 1 Biodiversity Management Report
Attached separately.

Appendix 2: Water and Soil Conservation Report
Attached separately.

Appendix 3: Climate Risk and Variability Assessment Report
Attached separately.

Appendix 4: Summary of Water Allocation of Resources report
Attached separately.