Environmental Monitoring Report

Project Number: 48402 January–June 2016

PAK: National Motorway M-4 Gojra–Shorkot Section Project

Prepared by Renardet S.A. for National Highway Authority and the Asian Development Bank.

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Bi-annual Environmental Monitoring Report

Project Number: (48402-001)

(January ~ June 2016)

Islamic Republic of Pakistan

Construction of Four Lane Motorway Faisalabad to Khanewal Project (M-4) 184 Km

Package-2: Gojra – Shorkot (61 KM) Financed by: Asian Development Bank

Prepared by: Renardet S.A. Geneva, Switzerland

For: National Highway Authority

This report does not necessarily reflect the views of ADB or the Government concerned, and ADB and the Government cannot be held liable for its contents.

Contractor	Client	Consultant	
BEIXIN	NUA		

M4 Faisalabad to Khanewal

Section 2A Gojra to Jamani

Xinjiang Beixin Road & Bridge Group Co. Ltd.

Renardet S.A Consulting Engineers Geneva Switzerland



	Asian Development Bank
RMD	Best Management Practices
BBS	Behaviour Based Safety
	Corrective and Proventive actions
CROs	Community Based Organizations
CD03	Carbon monoxido
dB	doci Boll
	District Coordination Officer
	Dry Chemical Powder
	District Police Officer
	District Folice Officer
FC	European Community
ΕLO	Environmental Impact Assessment
EMD	Environmental Management Plan
	Environmental Protection Agency
	Health Safety and Environment
	Not detectable
NEOS	National Environmental Quality Standards
NGVS	No quideline values
NHA	National Highway Authority
NO2	Nitrogen dioxide
PAPs	Project Affected Persons
RoW	Right of Way
SC	Supervision Consultants
SIMOPSimulta	aneous Operation
SO2	Sulfur dioxide
SSEMP	Site Specific Environmental Management Plan
TDS	Total Dissolved Solids
PM	Particulate Matter
PPE	Personal Protective Equipment
RD	Running distance
TRA	Task Risk Assessment
WHO	World Health Organization

Table of Contents

Summary of Findings 5
Chapter 17
Introduction7
1.1 Construction Activities/ Work progress:7
1.2 Project Organization:
1.3 Environmental, Health and Safety Management team:7
1.4 Relationships with Contractors, Owners, Lenders:7
Chapter 2 8
Environmental Monitoring
2.1 Noise and Vibrations:
2.2 Drinking Water Quality Analysis:8
2.3 Waste Water Analysis:
2.4 Air Quality:
2.5 Particulate matter (PM ₁₀)8
Chapter 3 9
Environmental Management9
3.1 Camps, Plants and Borrow Pits
3.2 Soil Erosion
3.3 Dust /Air Emissions Monitoring11
3.4 Waste Management11
3.4.1 Waste Water Management11
3.4.2 Solid Waste Management11
3.5 Occupational Health and Safety Management11
3.5.1 Emergency Preparedness and Response11
3.5.2 Training of Workers
3.5.3 Personal Protective Equipments
3.5.4 Site Visits/ Inspections
3.6 Corrective Action Plan:
3.7 Security Measures
3.8 Protected Areas
3.9 Social and Cultural Issues/ Grievance Redress Mechanism (GRM)
3.10 Record of labor deployed
3.11 Vehicles and Machinery Maintenance
3.12 Consultation and Complaints/ Grievances Redressed:
Annexure 1: Photographic Record from January to June 2016
Annexure II: Summary of Borrow Pits
Annexure-III Layout Plans of Camp Sites
Annexure IV: Environmental Monitoring

Summary of Findings

The Environmental monitoring for the Construction of Motorway M4 package 1 (Faisalabad-Gojra 58.2 Km) started in the month of March 2016. The construction of section 2A (Gojra to Jamani) is being carried out by **Xinjiang Beixin Road & Bridge Group Co. Ltd.** hereinafter called as "The Contractor", under the supervision of M/s Renardet S.A Consulting Engineers Geneva Switzerland hereinafter called as "The Consultant or The Engineer". The construction works are in progress. The overall financial progress of the contractor during the reporting period was achieved 2.86 % against the planned 5.65% lagging by 2.78 %.

In the month of May 2016 ADB Mission visited M4 Package 2A and 2B. During site visit of ADB Mission, a few non-compliances were observed. Those observations were notified to the Contractor and most of them have been rectified and further their improvement is in progress.

The Contractor has prepared Site Specific Environmental Management Plan (SSEMP) which has been reviewed by NHA and ADB and its approval is awaited. The Contractor has also prepared SSEMP for the temporary camps and Plants; and has been approved by NHA and ADB. The mobilizations of the Affected Person Committees (APCs) for the Grievance Redress Committee have been done in the first week of June. In section IIA total 17 APCs have been mobilized. The Contractor shall provide complaints registers in all the camps and plants. So far four complaints have been received, and all of them have been redressed accordingly. The general environmental conditions followed by implementation of SSEMP, remained satisfactory because more awareness of EMP implementation facilitated the issue. Since the project started stakeholders (NHA, Consultants and Contractor) had been trying to minimize the impacts of construction activities on the environment and the site staff became more skilled in Health & Safety issues. The dust on service road is being reduced by sprinkling water. The Contractor has been advised to prepare service road as per the contract. Monitoring of the PM₁₀ and noise has been conducted in the month of May and June. The values of the PM₁₀ emissions and noise remained within the permissible limits. Flagmen on few road crossings are deputed to control traffic and prevent accidents and collision of construction machinery with public transport. Signboards installation is in progress.

The Contractor has established their office and residential facilities for the local and Chinese employees at Para Colony Toba Tek Singh City, which are protected by armed Police and private security. The Contractor has their main site camp established at KM 80+00 on the Toba-Jang Road. The said camp is more than 1000 meters away from permanent settlements and other sensitive receptors, and has been approved by the Consultant and NHA. The said camp has site offices, residence facility for the local staff, Police, material testing laboratory, workshops, diesel station, steel yard, stores and Concrete Batching plant. The construction of the aforementioned facilities along with the barbed wire fence and security watch towers has been completed in the month of May. The installation and calibration of the Concrete Batching plant has been done in the month of March, while installation of Asphalt Batching plant is in progress. The Contractor has three more temporary camps for the residence of local workers at KM 58+500 adjacent to the RoW (Right side), at KM 68+600, 100 meters away from RoW (left side) and at KM 78+300, 150 meters away from the RoW (left side). All these temporary camps are approved by NHA and ADB. The construction of these temporary camps is in progress. Moreover the Contractor has one concrete batching plant at KM 58+530, 600 meters away from the RoW (right side). This site has been approved by the competent authorities. The installation of batching plant has been completed. The construction of boundary wall and other utilities are in progress. The second concrete batching plant is located at KM 67+500, 20 meters away from

the RoW (left side). This site has been approved by the competent authorities. The installation of batching plant and construction of boundary wall and other utilities are still in progress.

In all the camps and plants waste water treatment and solid waste management is in progress. The environmental aspects like liquid waste and solid waste are being collected and disposed of as per approved SSEMP. The waste water is being collected and treated by using Septic tanks and soakage pits in all camps.

The overall occupational health and safety conditions of the project remained satisfactory. Tool Box Talks (TBTs) have been arranged regarding PPEs use and importance, work site safety, housekeeping, POL spillage control, hand and power tools safety, environment safety, manual handling, excavation, welding cutting & grinding safety, security, concrete work, firefighting. Provision of safe drinking water is being maintained for the workers and staff at site camps and construction sites. The quality analysis of drinking water shall be conducted as per the SSEMP. Personal Protective Equipments (PPEs) are provided at most of the constructions sites and plants, the Contractor has been advised to provide and maintain use of necessary PPEs at all construction sites, plants and workshops.

The project conditions are improving with the joint efforts of the Client, the Engineer and the Contractor.

Chapter 1

Introduction

1.1 Construction Activities/ Work progress:

The financial progress of the project at the end of June 2016 is given as under.

Planned	5.65%
Achieved	2.86%
Laq	2.78%

1.2 Project Organization:

Mr. Xu Libing has been appointed as Project Manager by the Contractor, Mr. Sajjad Ahmad Goraya working as General Manager (M-4) NHA, Mr. Muhammad Luqman Warraich working as Project Director Section 2A, and Dr. Majed Assad as Team Leader of the Supervision Consultant/ Engineer

1.3 Environmental, Health and Safety Management team:

The contractor has hired a full time Environment/ HSE Engineer in the month of April. Supervision Consultant's Environmental Specialist is also on board since March.

1.4 Relationships with Contractors, Owners, Lenders:

The overall relationships of contractor, Employer, Supervision Consultant, and Funding Agency remained harmonious during the reporting period.

Chapter 2

Environmental Monitoring

The qualitative environmental monitoring is being carried out during construction activities and verifies that they are undertaken in compliance with the requirements set forth in EIA/EMP and Site Specific Environmental Management Plan (SSEMP). The PM₁₀ and noise analysis has been conducted in the month of May and June. For the Quantitative Environmental Monitoring, Contractor has made an agreement with Air Quality Laboratory SEAL Environment Consultants Lahore, for periodic Environmental Monitoring. The ambient air monitoring and stack emission monitoring, drinking and waste water quality analysis shall be conducted in the second half of the year.

2.1 Noise and Vibrations:

Noise level results show that most of the activities are being done in its permissible limits. Workers have minimum risk from these noise levels. In case a machine producing noise beyond threshold levels; are isolated e.g. generators to reduce the noise level. To minimize the noise vehicles are periodically checked for their noise level and notified for repairing and maintenance. The noise level at active construction sites are given as Annexure IV.

2.2 Drinking Water Quality Analysis:

At the Contractor main office and residential facilities at Para Colony bottled drinking water is provided, while at the site camps and construction sites drinking water are taken from any nearby source. The drinking water quality analysis shall be done in the second half of the year 2016 as per the SSEMP, where there water is taken from outer sources.

2.3 Waste Water Analysis:

Waste water from washrooms and kitchens are collected and treated through septic tanks and soakage pits at all camps and sub-camps. Currently no waste water is released into fields of irrigation water channels from any camp; however they shall be analyzed in the second half of the year 2016 as per the SSEMP.

2.4 Air Quality:

Ambient Air quality monitoring and stack gas analysis shall be carried out in the second half of the year 2016.

2.5 Particulate matter (PM₁₀)

The particulate matter monitoring started in the month of May 2016. The particulate matter (PM_{10}) monitoring has been done at two locations. Results of PM_{10} monitoring are given as Annexure IV.

Chapter 3

Environmental Management

Site Specific Environmental Management Plan (SSEMP) was submitted to the NHA and ADB. A separate SSEMP was prepared for the temporary camps and plants and submitted to NHA and ADB which was reviewed and approved.

The ambient air, stack gas analysis, drinking and waste water quality analysis shall be done in the second half of the current year. The PM_{10} and noise level analysis have been done in the month of May and June.

3.1 Camps, Plants and Borrow Pits

Camp I (KM 80 + 000)

The Camp is located at KM 80+000 the area for this is 12 acre and is 1.5 KM away from RoW (left side). This site has been approved by the Supervision Consultant. The installation of Batching plant has been completed. Its Calibration has been carried out successfully in February 2016. It has started production in March 2016.

Following are the compliances:

- Batching plant is operational since March 3, 2016.
- The construction of boundary wall for residential area and barbed wire fence around the rest of camp has been completed.
- Septic tank for wastewater management is in place.
- Solid waste management as per the SSEMP is in progress.
- First aid kit has been provided.
- Firefighting equipments have been installed.

Following are the recommendations:

- Solid waste need to be managed properly.
- Inspection of firefighting equipments required every month.
- Housekeeping need to be improved.
- Training of employees on occupational and environmental hazards and their safety.

Batching Plant 1 (KM 58+530)

The camp site for batching plant 1 is located at KM 58+530, 600 meters away from the RoW (right side). This site has been approved by the competent authorities. The installation of batching plant has been completed. The construction of boundary wall and other utilities are in progress.

Batching Plant 2 (KM 67+500)

The Batching plant 2 is located at KM 67+500, 20 meters away from the RoW (left side). This site has been approved by the competent authorities. The installation of batching plant and construction of boundary wall and other utilities are still in progress.

Sub-Camp 1 (KM 58+500)

The Sub-camp 1 is located at KM 58+500 and is adjacent to the RoW (Right side). This site has been approved from the competent authorities. The construction of residential rooms for local staff and workers, offices and boundary has been completed. However first aid kit, firefighting equipment's and PPEs are provided. Wastewater and solid waste shall be managed as per the SSEMP. For the time being construction of waste water septic tank has been completed and soakage pit is in progress.

Sub-Camp 2 (KM 68+000)

The Sub-camp 2 is located at KM 68+600, and 100 meters away from RoW (left side). This site has been approved from the competent authorities. The construction of residential rooms for local staff and workers, offices and boundary wall and other utilities are progress. However first aid kit, firefighting equipment and PPEs are provided. Wastewater and solid waste shall be managed as per the SSEMP. For the time being construction of waste water septic tank has been completed and soakage pit is in progress.

Sub-Camp 3 (KM 78+300)

The Batching plant 3 is located at KM 78+300, 150 meters away from the RoW (left side). This site has been approved by the competent authorities. The installation of batching plant and construction of boundary wall and other utilities are in progress.

Borrow pits:

The area from where soil is being taken for the construction of embankment is called Borrow area. The ditch that is dug to take soil is called borrow pit. The location and summary of all borrow areas is attached as **Annexure-II**. The environmental impacts of borrow areas are under observation during soil excavation, transportation and restoration. Designated routes are being used during soil transportation. Service road and adjacent road used for the transportation of soil are checked regularly, and the damage caused shall be rectified. The borrow areas' rehabilitation is done.

3.2 Soil Erosion

This environmental impact is due to the road sites construction activities. It occurs due to the clearing and excavation activities at the project site, as these activities are leading to the soil erosion, or alteration of soil quality resulting from removal of top soil at the site to some extent. The Contractor complies to distance limit of 500 meter from RoW. Mitigation measures adopted to minimize soil erosion include;

- In borrow pits; the depth of the pits is being maintained so that the sides of the excavation site have a slope not steeper than 1: 4.
- Soil erosion along the borrow pits is being monitored to prevent/ mitigate impacts on adjacent lands.
- Preventive measures are being taken to control the creation of mosquito-breeding sites in case the borrow pits were filled with water.
- Borrow pits are being used for construction, but during the excavation, top 20 cm soil cover was being preserved for vegetation after the excavation of the pits.

3.3 Dust /Air Emissions Monitoring

The construction activities generate dust due to excavation. Diesel and other petroleum products used for the operation of construction machinery and transportation equipment also cause air pollution. The impacts generated from such activities are of certian significance and proper mitigation measures are being practiced. Work force wear personal protective equipment including dust masks to minimize health impacts. Vehicle maintenance is regularly done to minimize the impacts of air pollution on the environment.

3.4 Waste Management

3.4.1 Waste Water Management

The wastewater is managed as per the SSEMP; at camp 1 and sub camps 1 construction of septic tanks and soakage pit were completed in the month of April; while at sub camps 1 construction of septic tank is completed and soakage pit in progress and shall be completed in the month of July. At sub camp 2 construction of septic tank is complete and soakage pit shall be complete in July. At all the batching plant camps waste water management is in progress.

3.4.2 Solid Waste Management

All the solid waste generated in the camps is being collected in waste drums, and excavation of solid waste collection point is in progress at all camps and plants. Solid waste after collection shall be segregated and then disposed of properly as per the SSEMP.

3.5 Occupational Health and Safety Management

The construction activities have certain impacts on the occupational and public health. At the work sites' hazards are eliminated/minimized through engineering controls and administrative controls, if the controls do not eliminate the hazards appropriate PPEs (PPE is a last level of control) are being provided to the workers. Workers are being trained and equipped with the appropriate Personnel Protective Equipments (PPEs).

3.5.1 Emergency Preparedness and Response

Emergency Response preparedness and response plan has been designed; details given in the SSEMP and shall be implemented accordingly. Following are the contact numbers of focal/ responsible personnel of the project.

Designation	Designation Name	
Project Manager	Xu Libing	0316-5131608
Chief Engineer	Liao Zhixiong	0312-9067516

	1	
Head of HSE Department	Muhammad Nazim	0333-8454178
Admin Manager	Muhammad younus	0320-7702144
Planning Engineer	Akhlaq Ahmed	0304-1371123
Sub camp1 @KM 58+500 PM	Asmat Ullah	0332-3228322
Sub camp 2 @Km 68+000PM	Afrasiyab	0312-0388008
Fire departments	Toba Tek Sing	16
Rescue 1122	Toba Tek Sing	1122
Police	Toba Tek Sing	15

3.5.2 Training of Workers

Workers have been trained in order to minimize risks and impacts of the occupational and environmental hazards. Tool box talks are arranged and will be arranged in future too; to aware the employees regarding the occupational hazards, their risks and safety measures. In the month of May a training/ orientation session was arranged through Rescue 1122 Toba Tek Singh on the Basic life support. Following is the list of Tool Box Talks delivered on site to date.

Sr.	Sr. Date Topics Location		Participants	Delivered By		
No.						
	<u>.</u>	Jun	ie 2016			
1	23 Jun 2016	Importance of using PPEs	Camp 1	6	Environmental Engineer	
2	24 Jun 2016	Fire Extinguisher use	Sub camp @ 58+000	8	Environmental Engineer	
3 24 Jun 2016 Training about safe and S healthy work		Site area @ 66+500	6	Environmental Engineer		
4 26 Jun 2016 Site work safety		Sub camp @ 68+000	7	Environmental Engineer		
5 03 May 2016 Basic Life Support Main office		Main office	12	Rescue 1122		
	May 2016					

1	18 May 2016	Importance of using PPEs	Main camp @	Environmental
			80+000	Engineer
2	20 May 2016	How to use fire	Sub camp @ 68+000	Environmental
		Extinguisher		Engineer
3	23 May 2016	Basic training	Sub camp @ 58+500	Environmental
				Engineer
4	07 May 0040		At alta @ 00 200	En increase a tal
4	27 May 2016	How to use PPEs during	At site @ 66+300	Environmental
		work		Engineer

3.5.3 Personal Protective Equipments

The workers are being forced to wear PPEs for their safety at work. They have been told to wear safety helmets, safety shoes, hand gloves, dust mask etc. and other necessary protective equipments while working at site, plant, workshops.

3.5.4 Site Visits/ Inspections

The Consultant Environment Specialist is visiting the active construction sites, camps, plants, workshops, and borrows pits along with the Contractor Environment Engineer. Issues and noncompliances observed are conveyed to the Contractor in writing and verbally and are also discussed in the fortnightly meeting. The Contractor Environment Engineer is also visiting construction sites, camps, plants and borrows pits; inspects work sites, welfare facilities, PPEs etc. and also deliver tool box talks. Workers have been trained to report near misses and take preventive and corrective actions as envisaged by HSE Engineer.

3.6 Corrective Action Plan:

Sr. No	Non-Compliance	Mitigation Measures	Status
	Provision of	An Ambulance to cope the emergencies will be	
01	Ambulance	provided by the Contractor.	In progress
00	Boundary wall	The boundary wall of sub camps 2 will be	
02	Doundary wan	completed soon	in progress
00	Signboard	Sign boards at service road crossing shall be	In progress
03		provided.	

Action Plan July 2016 Onward

	Waste collection	Waste collection point will be constructed in all	
04 point		camps at specific points.	In progress
05	Complaint Register	Complaint register will be provided at all camps for complaints of affected people around the motorway.	In progress

3.7 Security Measures

For the security of Chinese employees armed police constables are deputed. Currently 85 police personnel as well as 21 private security guards are on duty. The police personnel and private security guards are deputed on the Contractor's main office and residence inside Paira colony Toba Tek Sing city and at camp 1. The police personnel also escort Chinese employees whenever they travel to the construction and camp sites and other necessary locations. Moreover at the Chinese main office and residence barriers are placed to prevent unauthorized trespassing. Entry and exit record of all vehicles and visitors/ employees are also maintained. Barbed and razor wires fence has been fixed around the camp 1.

Location	Policemen	Private Security Guard
Main office (Paira Colony) T. T. Sing	45	11
Camp 1 at KM 80+000	40	10

A proper security system for all camps has been developed & maintained. This system includes following features:

- Fence has been constructed around the camp 1.
- Security rooms have been constructed at camp 1 (gate 1 and 2).
- Security barriers have been installed at entrance & exit of the main office and residence at Paira colony.
- Armed security guards have been deputed at gates of the main office and camp 1.
- CCTV cameras have been installed at main office at Para colony and camp 1.
- Barbed wire has been installed all over the boundary wall at Camp 1.

3.8 Protected Areas

There are no protected areas such as wildlife sanctuaries, game reserves or national parks, or any archaeological, historical or cultural heritage in its neighborhood therefore, no impact is envisaged.

3.9 Social and Cultural Issues/ Grievance Redress Mechanism (GRM)

Grievance Redress Mechanism (GRM) is institutions, instruments, methods, and processes by which a resolution to a grievance is sought and provided. People adversely affected (or about to be affected) by a development project will raise their grievances and dissatisfactions about actual or perceived impacts in order to find a satisfactory solution. Some grievances may arise during the project design and planning stage, while others may come up during project implementation. Not only should affected persons (APs) be able to raise their grievances and be given an adequate hearing, but also satisfactory solutions should be found that mutually benefit both the APs and the project.

The APs have been fully informed of their rights and of the procedures for addressing complaints verbally and in writing during the meetings. The complete mechanism to address/resolve the project related issues including the APs concerns or grievances including those related to the environment has been established. Currently 17 APCs have been mobilized in section 2A. The focal persons of these 17 committees shall be combined and one Grievance Redress Committee (GRC) be made. The GRC will be headed by the Project Directors of section 2A, with NHA's DD/AD (land) or DD/AD (environment. Besides, the GRC will include the environment staff of the Supervision Consultants, environment staff of the concerned contractor and representative of the local community (preferably the relevant GFP).

3.10 Record of labor deployed

Local employment is being encouraged to improve the socioeconomic conditions of the local people. It is always recommended to maintain employment record with admin department for reference. Record of all the labor deployed during the period is being maintained. Below is list of the local and Chinese employees.

S.N	Position	Numbers	S.N	Position	Numbers
1	Project Manager	01	21	Drivers	18
2	D.P.M	02	22	Dumper drivers	16
3	Material Engineer	01	23	Lab Helper	9
4	Admin Manager	01	24	Inventory Keeper	3
5	Contractor Engineer	01	25	Roller Operators	5
6	Field Engineer	9	26	Grader operators	1

7	Environmental engineer	01	27	W T Operator	20
8	Surveyors	13	28	Grader Operator	10
9	Surveyor helper	24	29	Site Engineer	7
10	Laboratory helper	18	30	Tran-Mix- Operator	6
11	Mechanical Engineer	01	31	Assistant mechanical	6
12	Mechanic	7	32	Welders	9
13	Assistant Accountant	02	33	Security Guards	20
14	Meson	3	34	Generator Operator	1
15	Labors	36	35	Electricians	4
16	Plant Operator	2	36	Sweeper	2
17	Forman	8	37	Fuel man	4
18	Security Officer	1	38	Cook	3
19	Cad Operators	3	39	Office Boys	3
20	Site Engineer	09	40	Coordinator	01
	Pakistani Employ	/ees	Ch	Chinese Employees	
	216			23	

3.11 Vehicles and Machinery Maintenance

Vehicles are periodically checked for their maintenance. For this purpose, noise and visual observation of vehicle exhaust emission is being done. Moreover record for the change of Mobile Oil for vehicles is also being maintained. These all the things will help to assess vehicle efficiency and need for its repair. Record is being maintained at workshops.

3.12 Consultation and Complaints/ Grievances Redressed:

Consultation sessions are being arranged from time to time to improve the environmental conditions of the project area. The complaints/ grievances received will be are noted/ recorded in the complaint registers at all camps and shall be redressed accordingly. Following is the record of the grievances received and redressed.

Sr.		Complainant Address/	Complaint	Action Taken	Remarks
No	Date	Contact			
01	16-06- 2016	Asmat Abbas 0345-7997305 Chak No. 305 J/B	Water channel problem due to pipe damage.	Replace with new pipes	Done
02	17-06- 2016	M. Mohsin 0346-6480900 Chak No. 378 J/B	Water channel blockage	Placed pipes at service roads	Done
03	20-06- 2016	Mazher Abbas 0344-7899469 Chak No. 469 J/B	Sewerage line broken	Change route to avoid the damages	Done
04	23-06- 2016	M. Yaseen 0343-7982396 Chak No. 396 J/B	Dust problem	Regular sprinkling of water to suppress dust.	Done

Annexure 1: Photographic Record from January to June 2016



Water sprinkling at service road (74+300)



Water sprinkling at service road (64+500)



Security scanner at entrance of main office Para Colony Toba Tek Singh



Security barrier provided at entry/exist point



PM10 analysis at 58+700



PM10 analysis at 58+700



PM10 analysis at 64+450



PM10 analysis at 64+450



Waste drum placed at camp site (80+000)



Mandatory Signboards at construction area



Tool box talk at sub camp @ 67+500



Tool box talk at sub camp @ 58+500



Basic Life Support Training by Rescue 1122 training at main office



Toolbox talks at sub camp at 68+000





First aid Kit at camp 1

Workers using PPEs at plant @ 58+500





Borrow area leveling at 58+700

Workers using PPEs at cattle creep construction



Cattle creep work in progress at 80+964



Pipe culvert work in progress at 58+200



Fire Extinguishers Installed at Camp 1 Workshop



Flagman at KM 68+000



Diesel Station at Camp 1



Concrete Batching Plant at Camp 1





Tool box talk at sub camp



Tool box talk at sub camp 68+000

Tool box talk at sub camp 58+500







Potable drinking water at camp site



Septic tank under construction at 68+000



Borrow area at 58+700

Annexure II: Summary of Borrow Pits

Borrow Areas

Borrow material are being taken from recommended and approved borrow areas. The recommended pits for borrowing shall be rehabilitated as soon as excavation of material is finished. The rehabilitation activity and process will take into consideration the aesthetics of the area and safety of people, animals and community. The agricultural fields which exist near to the project area are used as borrow pits by the approval of the Engineer & the permission of the field owner at a minimum distance of 500 meters from RoW.

Restoration of Borrow Pits

Before extraction commences, licenses and permits shall be checked and limits of disturbance and/or clearing will be clearly marked out on the site before any ground disturbing activity takes place. This usually requires the sides of the pit to be reshaped with gentle safe grades. All disturbed areas associated with borrow pits are part of the restoration plan.

List of Approved Borrow Areas

Borrow No	Location	Area	Distance from RoW (m)	Depth (cm)	L/S or R/S
01	88+200	18	600	30	L/S
02	86+700	22	800	30	R/S
03	87+100	23	700	30	L/S
04	68+400	12	700	20	L/S
05	68+350	6	600	30	L/S
06	58+700	25	700	20	L/S
07	65+150	16	900		L/S
08	86+950	24	1200	30	R/S
09	61+650	10	1000	90	L/S
10	67+200	12	900	90	L/S
11	66+700	12	800	20	L/S

12	87+700	24	600	30	R/S
13	86+300		1100	90	L/S
14	84+350	18	700	30	R/S
15	58+300		600		L/S
16	61+500	7	900	30	R/S
17	58+530	6	100	30	L/S
18	84+300	18	2000	30	L/S
19	80+900		1200	90	L/S
20	68+100	15	900	90	L/S
21	68+850	16	1200	20	L/S
22	68+500	5	800	90	L/S
23	68+400	7	750	30	L/S
24	73+000	12	1100	30	R/S
25	73+720	8	700	90	R/S
26	73+000	3	600	90	L/S
27	82+300		650	90	R/S
28	84+300	20	1200	30	R/S
29	84+050		850	90	R/S
30	85+400	20	1000	90	R/S
31	80+200	22	600	90	L/S
32	81+000		900	90	L/S
33	64+900	4	500	90	L/S
34	59+800	7	600	30	L/S
35	59+950	10	1200	90	L/S
36	62+700	12	1100	30	L/S

37	80+150	8	1500	30	R/S
38	72+950	6	700	90	R/S
39	73+050	9	800	30	L/S
40	74+500	15	900	30	R/S
41	84+400	8	1000	90	R/S
42	84+900	17	1500	90	R/S
43	69+800	12	850	90	R/S
44	69+100	12	1100	30	R/S
45	70+400	8	700	90	R/S
46	84+800	21	700	90	L/S
47	83+700	25	600	90	L/S
48	83+000	7	650	30	R/S
49	70+000		850	90	L/S
50		20	1000	90	R/S
51	84+280		700	30	L/S
52	64+900	13	900	90	L/S
53	71+400	4	500	90	L/S
54	83+000	12	600	30	R/S
55	89+000	10	1200	90	L/S



Google Earth Map & Layout Plan



Site Sub-Camp Layout Plan @KM 58+500



Batching Plant Layout Plan @KM 58+530



Site Sub-Camp Layout Plan @KM 68+000



Batching Plant Layout Plan @KM 67+500



Site Sub-Camp Layout Plan @KM 78+300

Annexure IV: Environmental Monitoring



PM₁₀ Analysis May - June 2016

Comments:

The graphic chart shows that the particulate matter was within the permissible limits. However they shall be reduced further by increasing the frequency of sprinkling of water on the service



Noise Level May - June 2016

Comments: The noise level are slightly above the Pak NEQs level; however vehicles producing noise above the limit shall be maintained and workers shall be provided necessary PPEs.