Draft Initial Environmental Examination

October 2014

Infrastructure Development Investment Program for Tourism (IDIPT) - Punjab

Subproject - Last Mile Connectivity to Cultural Sites in Western Circuits

Prepared by the Government of Punjab

CURRENCY EQUIVALENTS
(as of 7 October 2014)

Currency unit	–	Indian rupee/s (Re/Rs)
Re1.00	=	$0.0163
$1.00	=	Rs61.326

ABBREVIATIONS

ADB	–	Asian Development Bank
BOD	–	Biological Oxygen Demand
BoQ	–	Bill of Quantities
CO	–	Carbon Monoxide
CPCB	–	Central Pollution Control Board
CR	–	Community Reserve
DSC	–	Design and Supervision Consultant
EA	–	Executing Agency
EAC	–	Expert Appraisal Committee
EARF	–	Environment Assessment and Review Framework
EIA	–	Environmental Impact Assessment
EMP	–	Environment Management Plan
ES	–	Environmental Specialist
GC	–	General Conditions
Go	–	Government of India
GoP	–	Government of Punjab
IDIPT	–	Infrastructure Development Investment Program for Tourism
IEE	–	Initial Environmental Examination
INR	–	Indian Rupee
IPIU	–	Investment Program Implementation Unit
IPMU	–	Investment Program Management Unit
PUC	–	Pollution Under Control Certificate
MCA	–	Municipal Corporation of Amritsar
MINARS	–	Monitoring of Indian National Aquatic Resources Series
MLD	–	Million Liters per day
MoEF	–	Ministry of Environment and Forests
MFF	–	Multi- Trench Financing Facility
NGO	–	Non-Governmental Organization
NOx	–	Nitrogen oxide
PD	–	Project Director
PIU	–	Project Implementation Unit
PM	–	Particulate Matters
PMU	–	Project Management Unit
PWD	–	Public Works Department

RP	–	Resettlement Plan
RPM	–	Respirable Particulate Matter
SAUW	–	South Asia Urban Development and Water Division
SC	–	Scheduled Castes
SEAC	–	State Expert Appraisal Committee
SO_2	–	Sulfur dioxide
SPM	–	Suspended Particulate Matter
SPS	–	Safeguards Policy Statement
STP	–	Sewage Treatment Plant

NOTES

In this report, "$" refers to US dollars.

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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EXECUTIVE SUMMARY

1. **Background**. The Infrastructure Development Investment Program for Tourism Financing Facility (the Facility) will develop and improve basic urban infrastructure and services in the four participating states of Himachal Pradesh, Punjab, Uttarakhand and Tamil Nadu to support the tourism sector as a key driver for economic growth. It will focus on: (i) strengthening connectivity to and among key tourist destinations; (ii) improving basic urban infrastructure and services, such as water supply, road and public transport, solid waste management and environmental improvement, at existing and emerging tourist destinations to ensure urban amenities and safety for the visitors, and protect nature and culture-based attractions. Physical infrastructure investments will be accompanied by: (iii) capacity building programs for concerned sector agencies and local communities for better management of the tourist destinations and for more active participation in the tourism-related economic activities, respectively.

2. **Subproject Components**. The purpose of this subproject is to have last mile connectivity to the tourist destinations. The subproject components includes widening and strengthening of roads to the five (5) tourist destinations spread across Amritsar and Gurdaspur districts. The widening and strengthening proposal also includes construction of culverts, storm water drains, two bridges and few public amenities at selected locations.

3. **Executing and implementing agencies**. The executing agency is the Punjab Heritage and Tourism Promotion Board (PHTPB), Punjab. Project Management Unit (PMU) is set up at Chandigarh to coordinate the overall execution. Project Management Consultant (PMC) at Chandigarh provides assistance to PMU for the execution of the project. The implementing agency is Project Implementation Unit (PIU) which is set up at Amritsar that would be supported by Design Supervision Consultant (DSC). PWD, Punjab is the asset owners for this subproject.

4. **Categorization.** Based on the proposed interventions, the subproject has been classified as Environmental Category B as per the SPS as no significant impacts are envisioned. Accordingly this Initial Environmental Examination (IEE) has been prepared and the environmental impacts are assessed in order to provide mitigation and monitoring measures to ensure no significant impacts arises as a result of the subproject.

5. **Description of the Environment**. Subproject components are located in three districts namely Amritsar, Tarn Taran and Gurdaspur. The climate in the project districts is characterized by general dryness except in south–west monsoon season. Winter season (November to March) with temperatures ranging from 4°C to about 16°C, and a summer season (April to July) wherein temperatures reach 45°C. The average annual rainfall is about 601.5mm. River Ravi and Beas traverses through the subproject area. The subproject area has alluvial plain with light reddish yellow clayey soil; geologically it is one of the inter-fluvial tracts of the Punjab Plain. Bowl shaped plains cause floods in certain areas with even minimum intensity of rain. Though the project districts are continuous level plain–unbroken by hills or valleys– it is not homogeneous throughout, as the terrain of the floodplains differs from that of the upland plains situated away from the rivers. There are mostly agricultural fields in the nearby areas. There are no protected areas, wetlands, mangroves, or estuaries in or near the subproject locations.

6. **Environmental Management**. An Environmental Management Plan (EMP) is included as part of this IEE, which includes (i) mitigation measures for environmental impacts during implementation; (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) grievance redress mechanism. A number of impacts and their significance have already been reduced by amending the designs. The EMP will be included in civil work bidding and contract documents.

7. Locations and siting of the proposed infrastructures were considered in order to reduce the impacts further. The concepts considered in design of the subproject are (i) design, material and scale will be compatible to the local architectural, physical, cultural and landscaping elements; (ii) preference will be given to the use of local material and labour as best as possible; (iii) for conservation, local construction material available in the nearby region as best as possible suiting to those in existence; (iv) all painting (interior and exterior) will be with environment-friendly low volatile organic compound paints (v) earth backfill, if any will be done from the site excavated material; and (vi) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

8. **During the construction phase**, impacts mainly arise from the need to dispose of moderate quantities of construction debris. These are common impacts of road construction projects and there are well developed methods for their mitigation. Measures such as conducting work in the non-monsoon season and minimizing inconvenience by best construction methods will be employed. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. Facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only.

9. **Mitigation measures** have been developed to reduce all negative impacts to acceptable levels. Mitigation will be assured by a program of environmental monitoring that would be conducted during construction. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.

10. The stakeholders were involved in developing the IEE through on-site discussions and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the subproject. The IEE will be made available at public locations and will be disclosed to a wider audience via the ADB and PHTPB websites. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

11. The tourists and the local community in the subproject area will be the major beneficiaries of the project. The most noticeable net environmental benefits to the tourists and local community will be positive and large as the proposed subproject will improve access to reliable and adequate tourism facilities and propagate the local traditions and cultural heritage of the state. This subproject will also provide a common platform for local traditions and values; provide and improve business opportunities for local communities, linked to the cultural and natural heritage tourism.

12. **Consultation, Disclosure and Grievance Redress**. Public consultations will be done in the preparation of the detailed design and final IEE. On-going consultations will occur throughout the project implementation period. A grievance redressal mechanism has been described within the IEE to ensure that any public grievances are addressed quickly.

13. **Monitoring and Reporting**. The PMU, PIU, PMC and DSC will be responsible for environmental monitoring. The PIU with support from the DSC will submit monthly, quarterly and Semi-annual monitoring reports to the PMU. The PMU will consolidate the Semi-annual reports with the assistance of PMC and will send it to ADB. ADB will post the environmental monitoring reports on its website.

14. **Conclusions and Recommendations**. The proposed subproject is unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category "B" is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS, 2009 or Government of India EIA Notification, 2006.

I. INTRODUCTION

A. Background

15. The Infrastructure Development Investment Program for Tourism Financing Facility (the Facility) will develop and improve basic urban infrastructure and services in the four participating states of Himachal Pradesh, Punjab, Uttarakhand and Tamil Nadu to support the tourism sector as a key driver for economic growth. It will focus on: (i) strengthening connectivity to and among key tourist destinations; (ii) improving basic urban infrastructure and services, such as water supply, road and public transport, solid waste management and environmental improvement, at existing and emerging tourist destinations to ensure urban amenities and safety for the visitors, and protect nature and culture-based attractions. Physical infrastructure investments will be accompanied by: (iii) capacity building programs for concerned sector agencies and local communities for better management of the tourist destinations and for more active participation in the tourism-related economic activities, respectively.

16. The proposed subproject is part of Western Circuit. The Western Circuit is located in the North-Western segment of the state and includes the districts of Amritsar, Gurdaspur, Tarn Taran and Kapurthala. The western circuit is known for its rich historical importance; hence the Department of Tourism, Punjab has initiated a number of tourism development projects under IDIPT Tranche-1. On successful completion of this Tranche-1, few more subprojects that are potential to develop to attract more tourist as well as to preserve the cultural and heritage sites has been planned under the Tranche -2 projects. One of the key subprojects is to improve connectivity to the various tourist destinations in the western circuit.

17. This subproject Package No. PB/ IDIPT/ T3/ 10/ 14 as per the aide memoire will be advertised in Q 4 2015 and aims to improve connectivity at five tourist destinations of Amritsar and Gurdaspur districts. The city of Amritsar is identified as a Gateway Destination by Ministry of Tourism, Government of India. It is the main international air gateway to Punjab, containing the State's major pilgrimage and heritage attractions, and has the largest tourism draw.The district of Amritsar is part of Sikh Heritage Trail, Freedom Struggle Trail and Grand Trunk Trail which starts from Ambala in state and ends at Wagah Border. Gurdaspur district is another key tourist destination in the state of Punjab, it is part of Sikh Heritage Trail[1] and it is well known for its famous Gurdwaras[2].

18. The subproject Package No. PB/ IDIPT/ T3/ 10/ 14 as per the aide memoire includes the following components:

(i) Upgradation / strengthening / widening of last mile connectivity including culverts and bridges to the Samadh of Jarnail Sardar Shyam Singh & parking; Pul Kanjri from Amritsar - Attari Road and provision of last mile connectivity to Ramtirath

[1]As per Punjab Tourism Development Master Plan, 2008-2023; United Nations World Tourism Organization (UNWTO)

[2] A gurdwara (Punjabi: ਗੁਰਦੁਆਰਾ, *gurduārā* or , *gurdwārā*), meaning *the gateway to the guru*, is the place of worship for Sikhs;[1] however, people of all faiths are welcomed in the Sikh Gurdwara

from the other end connecting Jhanjhoti road near Kotla Doom and Saidopura including temple Phirni, parking and allied tourist facilities;

(ii) Improvement of Access Road from Gurudwara Darbar Sahib to Gurudwara Chola Sahib (0.70 Km) , Dera Baba Nanak

(iii) Widening and Improvement of Chheharta - Dhand - Bir Sahib road (2.40 Km)

19. The subproject area is falling under three districts namely (i) Amritsar (ii) Tarn Taran and (iii) Gurudaspur. The salient features of the subproject components have been discussed in the following sections.

20. *(i) Upgradation / strengthening / widening of last mile connectivity including culverts and bridges to the Samadh of Jarnail Sardar Shyam Singh & parking; Pul Kanjri from Amritsar - Attari Road and provision of last mile connectivity to Ramtirath from the other end connecting Jhanjhoti road near Kotla Doom and Saidopura including temple Phirni, parking and allied tourist facilities*: This subproject components falls under the Amritsar District and it is a combined package for the last mile connectivity and improvement for three (3) tourist destinations across the district.

a) **Samadh of Jarnail Sardar Shyam Singh Attariwala, Attari** is approximately at a distance of 600m from NH-1 and is about 25km from Amritsar on Amritsar-Wagah Border Road. Sardar Shyam Singh Attari (1785-1846) was a Sikh general in Sikh army of Lahore Darbar who belonged to a Jatt family of Sidhu clan. He was first in line to convert to the Sikhism in early days of Sikh political ascendancy and joined the Jatha or band of Sardar Gurbaksh Singh of Roranwala. He soon established his protection over an area around Attari, a village he founded some 25 km west from the holy city of Amritsar.

b) **Pul Kanjri** is located midway between Lahore and Amritsar. The site is associated with lifetime of Maharaja Ranjit Singh. The township was once a thriving trade center that suffered the brunt of the partition of the Punjab and a short occupancy by Pakistan during the 1971 war before being recaptured by Indian Army. Pul Kanjri now encompasses a ruined baradari[3], a historic sarovar (pond) with a temple, remnants of the old canal, and a mosque that reflects its historic and secular credentials.

c) **Ram Tirath Temple** is located 11 km to the west of Amritsar city. This place has great religious significance and attracts huge number of devotees. The place gets a special mention in the great Hindu epic “Ramayan”. This place was once the ashram of Saint Balmiki. The saint is believed to have scripted many of his sacred manuscripts at this place. As per the mythological beliefs Sita got shelter in Maharishi Valmiki’s hermitage after Rama deserted her. After Mata Sita gave birth to Luv and Kush at his ashram, Bhagwan Valmiki trained and made them proficient in the realms of religious and social life besides intricacies of warfare. At the site of the temple there is a hut where Mata Sita gave birth to luv and Kush. There is a large sacred tank here that is said to have been dug by Hanuman himself.

[3] **Baradari** also **Bara Dari** (Urdu: بارہ دری) is a building or pavilion with 12 doors designed to allow free flow of air. The structure has three doorways on every side of the square shaped structure. The building for their outstanding acoustic feature was used for the performances by Raqasaz (dancer)s, the noble courtesans of India and other artistes. They were also used for their fresh air during hot summers. *Bara* in Urdu/Hindi means Twelve and *Dar* is door.

21. *(ii) Improvement of Access Road from Gurudwara Darbar Sahib to Gurudwara Chola Sahib (0.70 Km), Dera Baba Nanak.* This subproject component falls under the Gurudaspur District

d) **Dera Baba Nanak** is located in the western direction at a distance of 35 km from Gurdaspur city. The Gurudaspur city is 55 km from Amritsar city and is well connected through rail and road network. It is situated on the bank of River Ravi and is considered to be one of the most sacred and important destination in Sikh Circuit. Two famous Gurudwaras at Dera Baba Nanak are Sri Darbar Sahib and Sri Chola Sahib. Other than these two important Gurudwaras, the destination is also significant because of the Shri Kartarpur Sahib DarshanSthal. On the right bank of river Ravi, just opposite to Dera Baba Nanak, is the town of Kartarpur founded by Shri Guru Nanak Dev Ji which is presently located in Pakistan. The town is at an approximate distance of 1 km from India-Pakistan border. The town has large number of Sikh temples. Dera Baba Nanak is a historical town and has many lanes and houses that have been preserved since the time of Guru Nanak.

22. *(iii) Widening and improvement of Chheharta Dhand Bir Baba Buddha Sahib road (2.40 Km) Chheharata - Dhand – Bir Baba Buddha Sahib Road.* This subproject component is located in the Amritsar District.

e) **Gurdwara Bir Baba Buddha Sahib** is situated on Chaabal - Amritsar road near village Jhabal Kalan in district Amritsar*,* Punjab*,* India. Guru Arjan Dev[4] also visited this place at some stage. Baba Buddha ji spent many years looking after the Bir, a reserved forest used for cattle grazing, said to have been offered to Guru Arjan by Chaudhari Langah of Patti out of his private lands. The shrine honours and commemorates Baba Buddhaji (1506 - 1631), the venerable Sikh of the time of Guru Nanak who lived long enough to anoint five succeeding Gurus.

B. Purpose of the IEE

23. In accordance with ADB's Safeguard Policy Statement (SPS, 2009), this IEE assesses the environmental impacts that are likely to arise due to the proposed subprojectand also specifies the *measures* towards addressing these impacts. The IEE is based on a careful review of SAR, concept notes, subproject site plans, field visits and secondary data to characterize the environment and identify potential impacts; and interviews and meaningful consultations with primary and secondary stakeholders.

24. Based on the collected information, the project categorization for Package No. PB/ IDIPT/ T3/ 10/ 14 as per the aide memoire for the subproject has been performed (refer **Table 1**). All 3 subprojects components have been categorized as "B" due to the environmental impacts that are envisaged; hence these subprojects require detailed IEE/EMP studies. The IEE shall cover all the construction and operation related environmental impacts. Since the subproject is at the concept stage, the environmental assessment is performed in a broader approach. During the detailed design, the prepared IEE shall be further updated as stand-alone IEEs and EMPs for the procurement packages No. PB/ IDIPT/ T3/ 10/ 14 as per the aide memoire which will be advertised in Q 4 2015 (and appended to the Contract document). This will enable integration of environmental provisions /management measures in the Contract Document. The IEE goes further and provides sample contract clauses (**Appendix 1**) that needs to be added to contract documents.

[4] Guru Arjan was the first Sikh martyr and the fifth of the eleven Sikh Gurus, who compiled writings to create the eleventh, the living Guru, Guru Granth Sahib.

Table 1: Subproject Categorization

Sl. No.	Subproject Name	Project Categorization[5]	Remarks
1.	Upgradation / strengthening / widening of last mile connectivity including culverts and bridges to the Samadh of Jarnail Sardar Shyam Singh & parking;	**B**	• Upgradation of PCC Approach road to the Samadh of Jarnail Sardar Shyam Singh Attariwala (600 m x 5.5 m). • Provision of 1 m wide berm (Brick on edge) on both sides. • Provision of storm water drainage system, along both sides of road • Upgradation of culverts.
	Pul Kanjri from Amritsar - Attari Road and		• Relaying of PCC approach road to Pul Kanjri (7km x5.5m). • Provision of 1 m wide berm (Brick on edge) on both sides. • Provision of storm water drainage system, along both sides of road • Provision of culverts. • Widening of two bridges.
	provision of last mile connectivity to Ramtirath from the other end connecting Jhanjhoti road near Kotla Doom and Saidopura including temple Phirni, parking and allied tourist facilities;		• Upgradation and strengthening of approach road to Ram Tirath Temple towards Jhanjhoti Road and Saidopura (3km x 3.5 m). • Provision of culverts
2.	Improvement of Access Road from Gurudwara Darbar Sahib to Gurudwara Chola Sahib (0.70 Km) , Dera Baba Nanak	**B**	• Strengthening and improvement existing road (0.7Km) in terms of its capacity and services.
3.	Widening and Improvement of Chheharta - Dhand - Bir Sahib road (2.40 Km)	**B**	• Upgradation of existing two lane road for the total length of 2.4 Km. • Provision of adequate footpaths.

C. Report Structure

25. This report contains ten sections including this introductory section: (i) Introduction, (ii) Description of Project Components, (iii) Policy, Legal and Administrative Framework, (iv) Description of Environment (v) Screening of Potential Environmental Impacts and Mitigation Measures, (vi) Information Disclosure, Consultation and Participation, (vii) Grievance Redresses Mechanism, (viii) Environmental Management Plan, (ix) Findings & Recommendations and (x) Conclusions.

[5] As per Safeguard Policy Statement (SPS), 2009

II. DESCRIPTION OF PROJECT COMPONENTS

26. This section briefs the proposed subproject components/ intervention with appropriate maps/locations for ready reference

(i) *Upgradation / strengthening / widening of last mile connectivity including culverts and bridges to the Samadh of Jarnail Sardar Shyam Singh Attariwala& parking; Pul Kanjri from Amritsar - Attari Road and provision of last mile connectivity to Ram Tirath from the other end connecting Jhanjhoti road near Kotla Doom and Saidopura including temple Phirni, parking and allied tourist facilities*

a) Connectivity from Amritsar to Samadh Jarnail Shyam Singh Attariwala, Attari.

27. The project area is located at a distance of 25 km from Amritsar town and owes proximity to Amritsar-Wagah Border Road. It is at a distance 600 m from NH-1. Amritsar is a major tourist centre in Punjab state. The site being located in close proximity to Amritsar city and Wagah *border* has immense potential to attract tourists.

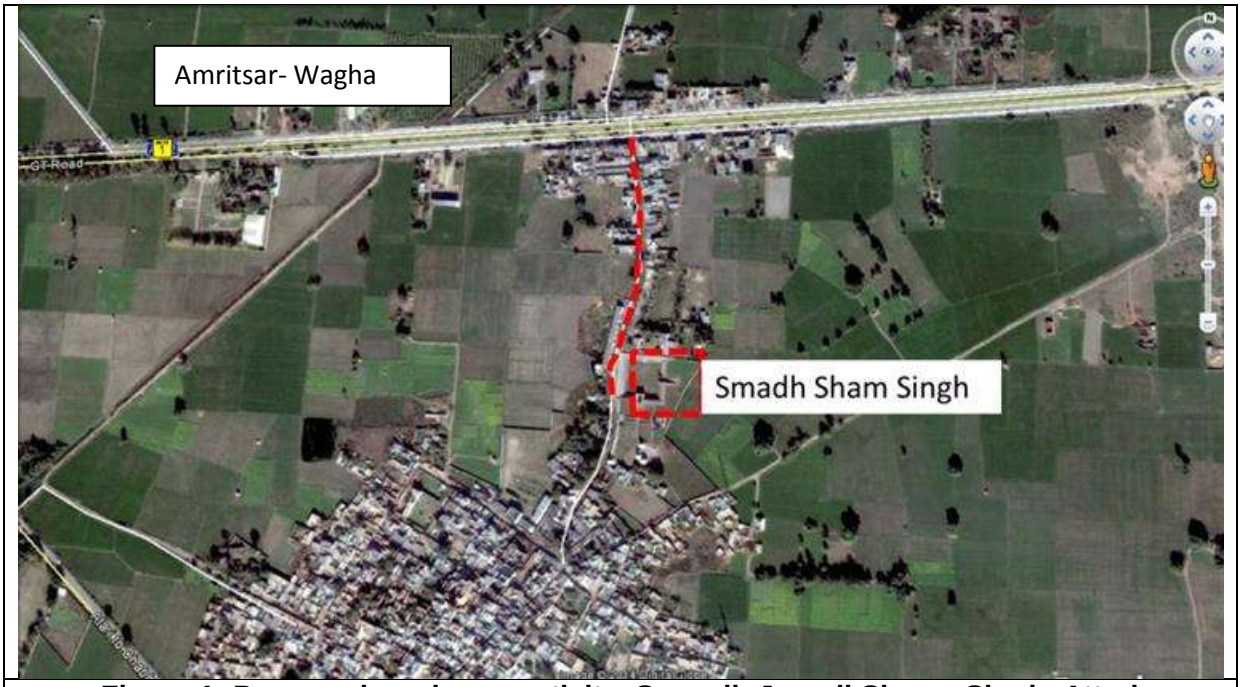


Figure 1: Proposed road connectivity, Samadh Jarnail Shyam Singh, Attari

Figure 2 : Road to Samadh Shyam Singh Attari

Figure 3 : Road to Ram Tirath Temple

28. The proposed subproject components for this package are:

- Upgradation of PCC Approach road to the Samadh of Jarnail Sardar Shyam Singh Attariwala (600 m x 5.5 m).
- Provision of 1 m wide berm (Brick on edge) on both sides.
- Provision of storm water drainage system.
- Upgradation of culverts.

b) Improving connectivity to PulKanjri

29. Pul Kanjri is situated at a distance of 35 km from Amritsar and 5 km from India *Pakistan* border at a village Dhanoe Kalan. Approach road leading to the memorial is approximately 2.57 km from the main Amritsar Wagah border road. Presently, the road is in deplorable state which causes inconvenience to the people during festival season.

Figure 4: Proposed road connectivity, to PulKanjri

30. The proposed subproject components for this package are:

- Relaying of PCC approach road to Pul Kanjri (7km x5.5m).
- Provision of 1 m wide berm (Brick on edge) on both sides.
- Provision of storm water drainage system.
- Provision of culverts.
- Widening of two bridges.

c) Connectivity to Ram Tirath Temple, Amritsar

31. Ram Tirath temple is located at a distance of 11 km towards west of Amritsar city. This place has great religious significance and attracts huge number of devotees. A number of temples are *scattered* around this particular site. There is a hut near temple site where Mata Sita[6] gave birth to two sons called Luv and Kush. The Ram Tirth Temple has Maharishi Valmiki's hermitage and a well with stairs where Mata Sita used to take her bath. The Temples exhibit scenes from Ramayana[7].

32. The proposed subproject components for this package are:

- Upgradation and strengthening of approach road to Ram Tirath Temple towards Jhanjhoti Road and Saidopura (3km x 3.5 m).
- Provision of culverts.

(ii) *Improvement of Access Road from Gurudwara Darbar Sahib to Gurudwara Chola Sahib (0.70 Km) , Dera Baba Nanak*

33. Dera Baba Nanak lies in the west of Gurdaspur district, and borders India Pakistan boundary. It is at a distance of 35 km from Gurdaspur city and 55 km from Amritsar city. The city is about 5 to 6 km from Shri Kartarpur Sahib (Pakistan). The town is well connected through rail and road network, nearest railway stations are Dera Baba Nanak Railway Station which is 2 km from the main town and Ratar Chattar Railway Station. The main railway junction lies 52 km from Dera Baba Nanak in Amritsar. State highway SH-25 connects the town with Gurdaspur on the east and Amritsar towards the south. Other than this, it is also connected to its neighboring towns by way of an established road network. At the town level, a characteristic ring road (referred to as phirni road) of about 2.9 km length circumscribes the settlement. The significant Gurudwara Darbar Sahib and Gurudwara Chola Sahib are accessible via this road. The road towards Kartarpur Darshan Sthal also connects to this ring road.

[6] Sita is the central female character of the Hindu epic ***Ramayana*** and was born in Janakpurdham present day Mithila, Nepal.[1][2] She is the consort of the Hindu God Sri Rama (avatar of Vishnu) and is an avatar of Lakshmi, Goddess of wealth and wife of Vishnu.

[7] The **Ramayana** or **Rāmāyaṇa** is one of the great Hindu epics. It is ascribed to the Hindu sage Valmiki and forms an important part of the Hindu literature

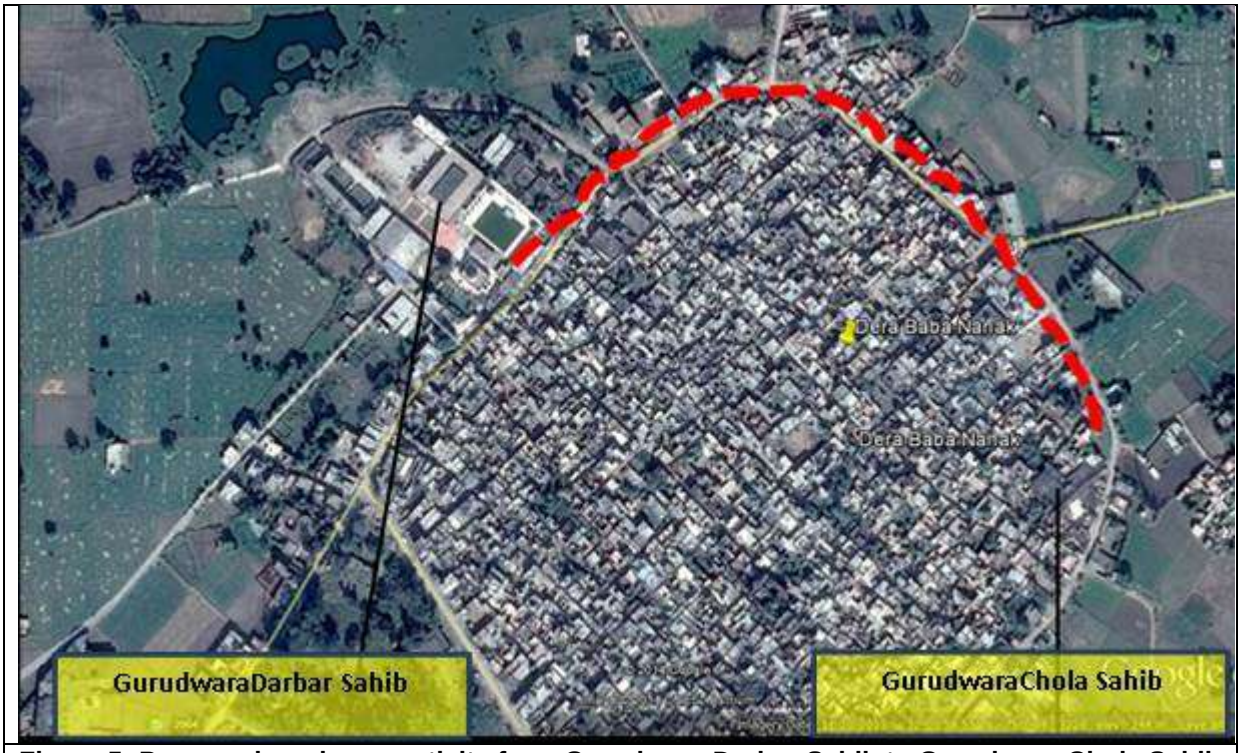


Figure 5: Proposed road connectivity from Gurudwara Darbar Sahib to Gurudwara Chola Sahib

34. The town is one of the most sacred places in Punjab for the Sikh Religion. It is situated on the banks of River Ravi. Guru Nanak Dev, the first Sikh Guru, settled and spent his life near the village Pakhoke, opposite to the present town. Dera Baba Nanak and the same is named as Kartarpur in Pakistan - a town which lies near the border in Pakistan. Kartarpur is famous for the Gurdwara Kartarpur Sahib, which is the first Gurudwara ever built. It can be viewed through binoculars from the Dera Baba Nanak (from Indian border). The Bedis, descendants of Guru Nanak Dev built a new town and named it Dera Baba Nanak after their great ancestors. Pilgrims come to this holy town in large numbers.

35. The proposed subproject components for this package are:

- Strengthening and improvement existing road (0.7Km) in terms of its capacity and services

(iii) *Widening and Improvement of Chheharta - Dhand - Bir Sahib road (2.40 Km)*

36. This *Gurdwara* is situated at a distance of about 1.5 Km towards the West of village Thatha Khara. It is located at 16 Km from Tarn Taran City and 24 Km from Amritsar City via Chheherta Road in District Tarn Taran, Punjab.

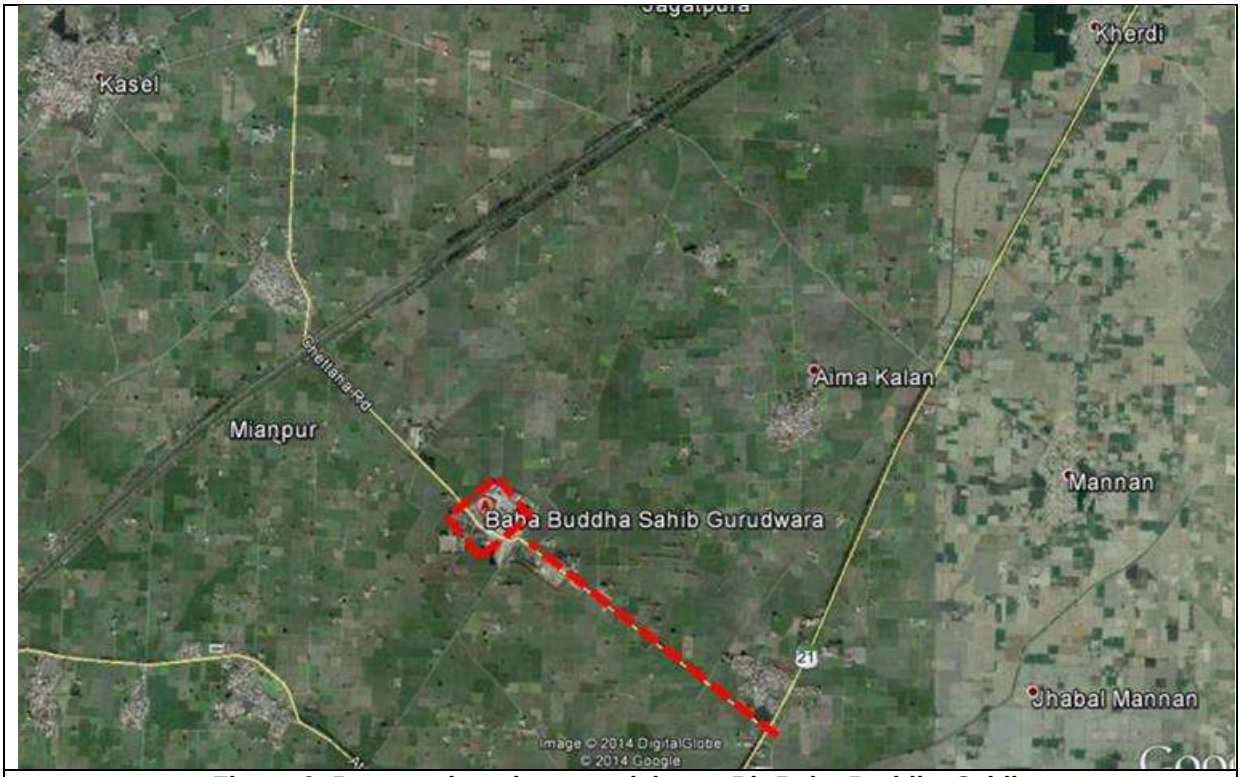


Figure 6: Proposed road connectivity, to Bir Baba Buddha Sahib

37. The proposed subproject component for this package

- Upgradation of existing two lane road for the total length of 2.4 Km.
- Provision of adequate footpaths.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

38. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This *states* that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries and private sector loans.

39. **Screening and Categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and *location* of the project, the sensitivity, scale, nature and magnitude of its potential impacts and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts and are assigned to one of the following four categories:

- **Category A**. Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- **Category B**. Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- **Category C**. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.

- **Category FI**. Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all Projects will result in insignificant impacts.

40. **Environmental Management Plan.** An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and *complexity* of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

41. **Public Disclosure.** The IEE will be put in an accessible place (e.g., local government offices, libraries, community centers, etc.), and a summary translated into Hindi/Punjabi for the project *affected* people and other stakeholders shall also be disclosed. The following safeguard documents will be put up in ADB,s website so that the affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

- *For environmental category A projects, a draft EIA report at least 120 days before Board consideration;*
- *Final or updated EIA and/or IEE upon receipt; and*
- *Environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt.*

B. National and State Laws

42. Implementation of the subproject will be governed by the national and State of Punjab environmental acts, rules, regulations, and standards. These regulations impose restrictions on activities to minimize/mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subproject are consistent with the legal framework, whether national, state or municipal/local. Compliance is required in all stages of the subproject including design, construction, and operation and maintenance

43. The environmental rules and regulations applicable for the subproject are listed in Table 2. The Environmental Impact Assessment (EIA) notification, 2006 by the Ministry of Environment and Forests (MoEF, GoI) specifies the mandatory requirements for obtaining environmental clearance. Accordingly, all projects and activities are broadly categorized into two categories[8] - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man-made resources. Given that the sub-project is not covered in the ambit of the EIA notification, Environment clearance requirements from the GoI are not triggered.

[8]All projects or activities included as Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, will require prior environmental clearance from the CentralGovernment in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification;

All projects or activities included as Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfil the General Conditions (GC) stipulated in the Schedule, *will* require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this notification.

In addition, General Condition (GC) of the notification specifies that any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) Notified Eco-sensitive areas, (iv) inter-State boundaries and international boundaries.

Table 2: Environmental Regulatory Compliance

Sub-Project	Applicability of Acts / Guidelines	Compliance Criteria
1. Upgradation / strengthening / widening of last mile connectivity including culverts and bridges to the Samadh of Jarnail Sardar Shyam Singh & parking; PulKanjri from Amritsar - Attari Road and provision of last mile connectivity to Ram tirath from the other end connecting Jhanjhoti road near Kotla Doom and Saidopura including temple Phirni, parking and allied tourist facilities; 2. Improvement of Access Road from Gurudwara Darbar Sahib to Gurudwara Chola Sahib (0.70 Km) , Dera Baba Nanak **3.** Widening and Improvement of Chheharta - Dhand - Bir Sahib road (2.40 Km)	The EIA notification, 2006 (and its subsequent amendments in 2009) provides the details for categorization of projects into category A and B, based on extent of impacts.	This subproject is not covered in the ambit of the EIA notification as they are not either covered under Category A or Category B of the notification. As a result of the above categorization, the subsequent environmental assessment and clearance requirements are not triggered
	Safeguard Policy Statement, 2009. The Environment Policy and Operations Manual (OM) 20: Environmental Considerations in ADB Operation	Categorization of sub-project components into A, B or C and developing the required level of environmental assessment for each component. Based on the construction activities involved in this subproject components, it shall be categorized as 'B'.
	Water (Prevention and control of pollution) Act, 1974 and Air (prevention and control of pollution) Act, 1981	Consent to Establishment (CTE) and Consent to Operation (CTO) from the Punjab Pollution Control Board is mandatory for all subproject components those requiring, setting up of hot mix plants, wet mix plants, stone crushers and diesel generators. The consent shall be obtained by the Contractor.
	The Wildlife Conservation Act, 1972, amended in 2003 and 2006, provides for protection and management of Protected Areas.	The implementation of the subproject components does not have any impact on the forest and the wildlife, hence obtaining clearance under the Act is not envisaged at any stage of the project
	The Forest Conservation Act, 1980 and its subsequent amendments necessitate obtaining clearance from the MoEF for diversion of forest land for non-forest purposes.	Project site is not located within forest area (Reserved or Protected Forest). However, during the up gradation/ widening of the last mile connectivity there will be an impact on the avenue trees. Hence as per the detailed design the actual number of trees getting affected have to be identified/ noted and tree felling permission for the same has to be obtained for the concern forest department prior to the start of the construction works.
	The Ancient Monuments and Archaeological Sites and Remains Act, 1958, and the rules, 1959 provide guidance for carrying out activities, including conservation, construction and reuse in and around the protected monuments.	Not applicable as these sites and monuments are not under the ambit of this Act. However, local archeological department suggestion on the same shall be considered during the project designing/ planning

Source: MoEF, CPCB and ADB

44. Table 2 indicates that the proposed subproject does not need to go through a full-scale environmental assessment process; as the scale of impacts and categorization of the sub-project components will not require further clearances. Therefore, any further approvals or environmental clearances from the GoI or GoP are not envisaged.

45. The ADB guidelines, stipulate addressing the environmental concerns, if any, of a proposed activity in the initial stages of project preparation. For this, the ADB Guidelines categorizes the proposed components into categories (A, B or C) to determine the level of environmental assessment that is required to address the potential impacts. The Rapid Environmental Assessment (REA) checklist method was followed as per ADB requirement to assess the potential impacts of the project in planning phase. The REA checklist is attached as **Appendix-2** with this report. The subproject has been categorized as B. Accordingly this IEE is prepared to address the potential impacts, in line with the recommended IEE content and structure for Category B projects. The IEE was based mainly on secondary sources of information and field reconnaissance surveys. Stakeholder consultation was an integral part of the IEE. An Environmental management plan (EMP) outlining the specific environmental measures that are to be adhered to during implementation of the subproject has been prepared.

IV. DESCRIPTION OF ENVIRONMENT

A. Environmental and Social Profile

46. The identified subproject is located in the Amritsar and Gurdaspur districts. The environmental and social profile for the subproject area has been prepared district wise.

(i) Amritsar District

47. The sub project is located in the Amritsar district. Amritsar district is located in northern part of Punjab state and lies between 31° 28' 30" to 32° 03' 15" north latitude & 74° 29' 30" to 75° 24' 15" east longitude. Total area of the district is 5,056sq.km. The Amritsar District falls in the Jullundur Division of the Punjab. In shape, it is a trapezium, with its base resting on the River Beas. It forms a part of the tract known as the Bari Doab or the territory lying between the rivers Ravi and Beas. Its western side adjoins Pakistan, partly separated by the River Ravi. The north-eastern side is bounded by the Gurdaspur District, and towards it south-east across the River Beas lies the Kapurthala and Tarn taran districts.

1. Physiography

48. Amritsar district is located between the Beas River in the east and the Ravi River the Upper Bari Doab and is one of the inter-fluvial tracts of the Punjab Plain. Amritsar has an altitude of 192m above the main sea level. Because of its shaped like a bowl, even with low intensity rainfall, the district is easy to be flooded. Amritsar district has two major landforms viz. alluvial plain and flood plain.

49. **Alluvial Plains**: Alluvial plain constitutes the major part of the district. This unit is formed by the alluvial deposits brought by Ravi and other rivers of Indus system. The alluvial plain along the Beas River is dissected by the back erosion and there is a chain of gullies or ravines along the river Beas. The upland plain spreads almost the whole district, except the western half of Ajnala tehsil[9], the eastern margins of Baba Bakala. This plain abruptly rises above the Beas River in the east and slopes very gently towards the Ravi. It possesses a firm base of alluvium and has an appearance of a vast stretch of level land. There are a few scattered sand mounds and clay mounds, with a local land relief of only 2m to 6m.

50. **The flood plain of Ravi and Beas**: The flood plain of Ravi and Beas rivers are the other landform in the district. The flood plain of Ravi occupies the western half of Ajnala tehsil and accounts for about 7% of the total area of the district. It is locally known as the sea Bet Ravi. It stretches between the Ravi in the west and its tributary Sakki Nala to its east. The Ravi flood plain is low lying and the tract is waterlogged due to flooding by both the Ravi and Sakki. Its surface configuration is uneven and, at places, it contains abandoned courses of the river, patches of marshy land and thickly growing grass. In contrast to Ravi, which makes a wide floodplain, the Beas does not form any such feather along its course.

2. Climate

51. The climate of the project area is Sub-Tropical Monsoon climate. It is characterized by general dryness except during the brief south-west monsoon season; a hot summer is a bracing winter. The year may be divided into four seasons. It comprises of the winter season (November to March) when temperatures ranges from 16°C (61°F) to about 4°C (39°F), the hot season (April to June) when temperatures can reach 45°C (113°F), monsoon season (July to September) and post-monsoon (September to November). The lowest recorded temperature since 1970 is −2.6°C (27°F) recorded on 21 Jan 2005. The highest temperature recorded is 47.7°C (117.9°F) on 21 May 1978. The climate is generally characterized by dry weather except during the brief southwest monsoon season. The wind direction of Amritsar is from NE to SE.

[9] A **tehsil** (also known as **tahsil**, tahasil, taluka, taluk, or taluq) is a unit of government in the Republic of India - it is similar to a county.

3. Rainfall

52. Rainfall in Amritsar varies from 12mm to 670mm per month. The average annual rainfall in the district is 520.9mm with around 33 rainy days. The rainfall in the district increases generally from the South-west towards the north-east and varies from 435.5 mm. About 75% of the rainfall in the district is received during the period from June to September and as much as about 18% rainfall occurs during the period from December to February.

4. Soil

53. The soils of the Punjab plains belong to the typical alluvium of the Indo-Gangetic plains. The majority of the soils are loamy or sandy loam consisting of a soil crust of varying depth. Hardly any profile characteristics are observed; soluble salts are present in considerable amounts. The lower layer consists of kankar nodules. The soils are generally alkaline innature and are adequately supplied with phosphorus and potash, but are deficient in organic matter and nitrogen. Geologically, the alluvium is divided into khaddar, i.e., the newer alluvium of sandy, generally light-coloured and of a less concretionary composition; and Bhangar, i.e., the older alluvium of a more clayey composition, generally of dark appearance and full of kankar. The soils differ in consistency from drift sand to loam and from fine silt to stiff clay. A few occasional pebble beds are also present. The formations and hard-pans are observed at certain levels in the soil profile through the binding of soil grains by the infiltrating silica or calcareous matter, forming an impervious layer, which is often observed in these alluvial soils. Layers of kankar in the Indo-Gangetic alluvium of the district are also observed.

5. Geology

54. The district forms part of Uppar Bari Doab and is underlain by formations of Quaternary age comprising of alluvium deposits belonging to vast Indus alluvial plains. Sub surface geological formations comprise of fine to coarse grained sand, silt, clay and kankar. Gravel associated with sand beds occurs along left bank of Ravi. The beds of thin clay exists alternating with thick sand beds and pinches out at short distances against sand beds. Central Ground Water Board (CGWB) has carried out ground water exploration up to a depth of 450 meters at village Kohala (Lopoke) in Chogwan block. Total thickness of alluvium is expected to be more than 450m as bedrock has not been encountered up to that depth.

6. Surface Water Quality

55. Beas and Ravi Rivers account for surface waters in Amritsar district. The water quality of the rivers was frequently monitored by the Punjab Pollution Control Board (PPCB). The purpose of the monitoring is to study the pollution load in the rivers and to take appropriate measures to control the pollution. Based on the analysis the water quality has been classified as A to E.

Class A – Drinking water source without a conventional treatment but after disinfection
Class B – Outdoor bathing (organized)
Class C – Drinking water source after conventional treatment and disinfection
Class D – Propagation of wild life and fisheries
Class E – Irrigation, industrial cooling, Controlled waste disposal

56. The following table details the water quality of the Rivers Beas and Ravi. From the observation, it shall be concluded that the water quality remains good at most of the sampling stations. However, the water quality is found deteriorating at few locations, where the water quality has been classified as “C”. This may be due to the anthropogenic activities like discharge of untreated sewerage and other effluents into the rivers.

Table 3: Surface Water Quality of Beas and Ravi Rivers

Name of River	Sampling Points	BOD (mg/l)	COD(mg/l)	DO (mg/l)	Coliform MPN/100 ml	Water Class as D.B.U. Classification
Beas	Beas at Talwara H.W.	0.2	1.8	8.0	39	A
	U/S Pathankot	0.7	2.5	7.8	230	B
	D/S Pathankot	0.6	3.1	7.6	388	B
	Beas at Mirthal Bridge Gurdaspur	0.8	3.4	7.6	463	B
	Beas at 1 Km. D/S of effluent discharge at Mukerian	1.3	4.0	7.3	650	C
	Beas at G.T. road under bridge near Kapurthala Punjab	1.7	3.1	7.4	600	C
	Beas at U/S Goindwal	0.8	3.9	6.9	488	B
	Beas at 100 Mts.D/S industrial discharge point Goindwal	0.8	4.1	6.9	788	C
	Beas at Harike	0.8	4.3	6.6	350	B
Ravi	Ravi at U/S of Modhopur H.W. (Gurdaspur)	0.2	2.1	7.8	N.D.	A

Source: Punjab Pollution Control Board as cited in Statistical Abstract of Punjab, 2009

7. Groundwater Quality

57. Physicochemical quality of groundwater of shallow aquifer shows that all parameters are within the permissible limits for drinking purpose set by the Bureau of Indian Standards (BIS) IS:10500. Salinity, Chloride, Nitrate and Fluoride are the important parameters that are normally considered for evaluating the suitability of ground water for drinking uses. Groundwater occurs with in desirable levels with respect to EC (less than 1000 micromohos/cm at 25°C), Chloride (<250mg/l), Nitrate (< 45mg/l) and Fluoride (< 1mg/l) in all samples. As per geochemical classification, the shallow groundwater is CaMg- HCO_3 type which is alkaline in nature. Ranges of various water quality parameters in groundwater are given in the **Table 4**.

Table 4: Groundwater Quality of Amritsar District

Sl.no	Parameters	Units	Range
1.	pH		8.00 - 8.25
2.	EC	micromohos/cm at 25°C	375 - 875
3.	CO_3	mg/l	Nil
4.	HCO_3	mg/l	156 - 350
5.	Alkalinity as $CaCo_3$	mg/l	128 - 287
6.	Cl	mg/l	11 - 84
7.	SO_4	mg/l	8.0 -155
8.	NO_3	mg/l	1 - 26
9.	Fe	mg/l	0.28 - 0.90
10.	F	mg/l	0.08 - 0.53
11.	PO_4	mg/l	0.007 - 0.08
12.	Ca	mg/l	12 - 30

Source: CGWB, Amritsar

58. The suitability of ground water for irrigation is generally assessed considering salinity (EC), Sodium Adsorption ratio (SAR), Residual Sodium Carbonate (RSE) and Boron parameters. Ground water from Amritsar district falls in C_2S_1 category which is suitable for irrigating semi salt tolerant crops on all soils.

59. Groundwater pollution studies were carried out in Amritsar city by CGWB. The water samples have been collected from 27 shallow aquifers and 23 deeper aquifers. The physicochemical studies have indicated that Electrical Conductivity, Sulphate, Nitrate and Fluoride concentration in shallow groundwater is higher as compared to deeper aquifer. The pollution in the form of Nitrates at shallow depth is due to sewage effluent. The heavy metals (Copper, Lead, Manganese and Iron) in shallow groundwater are more than the desirable limit, where as in deeper levels the concentration of heavy metals is comparatively low. In general the shallow groundwater is comparatively more polluted than the deeper aquifers due to anthropogenic activities like sewerage discharge on land and industrial pollution.

8. Ambient Air Quality

60. The AAQ of the Amritsar district is deteriorated by increasing vehicle traffic, presence of small and large scale industries and other sources of air pollution, including pollution from developmental activities, handling and burning of municipal and domestic waste, agriculture waste burning etc. With a view to clearly assess and monitor the status & quality of ambient air in Amritsar, several monitoring stations in different parts of the city i.e. industrial, residential and commercial zones have been established by the Punjab Pollution Control Board (PPCB). These stations have been placed at the most vulnerable parts of the city, which not only carry large volume of traffic but also have large number of industrial/residential/commercial units.

61. The data collected from these monitoring stations with respect to SPM, SO_2 and NO_x reflects higher SPM levels in the air in both residential and commercial areas against the permissible limit of 140µg/m^3 indicating deteriorating quality of air in these areas. The higher SPM levels have also been recorded in the industrial areas of the city then permissible level of 360µg/m^3in the monitoring stations located at Indian Textile - Amritsar, Mehta and Avan. With regard to the level of SO_2 and NO_x, it has been found that the permissible limits are well below the prescribed standards in all the areas.

Table 5: SPM, SO_2 and NO_x levels in Industrial Area of Amritsar at different Air Monitoring Stations (Units: µg/m^3)

Sl.no	Parameter	Amritsar			Standards		
		Ind Textile	Mehta	Avan	Residential	Commercial	Industrial
1	SPM	430.50	374.33	444.67	200	100	500
2	NO_x	17.50	14.00	436.67	80	30	120
3	SO_2	37.25	38.67	43.00	80	30	120

Source: PPCB, Amritsar

9. Ambient Noise Quality

62. Ambient noise quality has been monitored by Punjab Pollution Control Board (PPCB) at various locations, indicating high noise levels largely from vehicles, especially near the Golden Temple. In Amritsar, maximum noise levels were 82 decibels (dB(A)) at day and 68 dB(A) at night. Even in sensitive zones of Amritsar, the maximum levels were 66 dB(A) at day and 48 dB(A) at night against the prescribed limits of 50 dB(A) at day and 40 dB(A) at night. Noise level measured in Batala city of Gurdaspur District ranges from 64 dB(A) to 68 dB(A).

10. Agriculture

63. The principal kharif crops are paddy, cotton, maize and sugarcane; subsidiary crops are kharif vegetables, such as ladyfinger, cauliflower, tomato, brinjal, cucurbits, kharif pulses and fruits. The principal rabi crops are wheat, gram, barley etc. Wheat, Maize, Rice and Bajra are the important cereals of the state. Wheat dominates the production among overall crop pattern, while cotton is the major cash crop produced. Groundnut, sugarcane and potatoes are other crops. The principal rabi oilseeds (sarson, toramira, alsi and toria), and winter vegetables such as peas, turnip, radish, carrots, lobia.

64. In terms of natural vegetation, in the Shahpur Kandi range which lies in the hilly tract, the forests are mainly of the miscellaneous hardwood species and the Chil pine. Where water facilities are available, Shisham, mulberry, eucalyptus and poplar are being planted. Besides mango and mulberry, other fruit trees cultivated in the district include orange and Kinnow Lemon tree.

11. Ecological Resources

65. **Forest Cover:** Forest cover in the Amritsar district is very little; only 30.31ha area which is about 0.01 % of the Total Geographical Area (TGA) of the district. This is negligible when compared to 33% which is required as per National Forest Policy. The Harsha Chinna block has 27.68 hectares area (0.12 % of TGA of the block) followed by 2.63 ha in Verka block under reserved/ protected forests whereas the Ajnala, Choganwan, Jandiala, Majitha, Rayya and Tarsikka blocks have no mappable area under forests.

66. **Wetlands:** The wetlands in the district occupy 2533.73ha area which is 0.95% of the TGA of the district. Marshes and swamps are mainly along the Ravi River in Choganwan block of the district. Nearly 1221.95ha area (3.03 % of TGA of block) of Choganwan block is under wetland which is maximum among the other blocks of the district. In Ajnala block 1085.45ha (2.38 % of TGA of block) is under wetland. In addition, Rayya and Jandiala blocks have 223.25ha and 3.07ha area respectively under wetlands.

67. **Flora:** The floral diversity consists of Shisham (*Dalbergia sissoo*) and Kikar (*Acacia arabica*) are the main timber-trees. Jaman (*Eugenia jambolana*) and Mango (*Mangifera indica*) are planted in many places on account of the value of their fruit and dense shade. Pipal (*Ficus religiosa*) and Borh (*Ficus bengalensis*) are identified at any locations and they are worshipped as sacred trees. Other trees include varieties of mulberry, such as Shahtut (*Morus alba*), Tut (*Morus Idevigata*); Ber (*zizyphus jujuba*); Dhrek or Persian lilac (*Melia azadirachta*), Siris (*Albizzia lebbek*) and Vilyati kikar (*Acacia farnesiana*). Plants of economic importance, such as Sohanjana (*Moringa ptergyosperma*), Kachnar (*Bauhinia variegata*) and Lasura (*Cordia muxa*). Evergreen trees like Arjun (*Terminalia arjuna*), Bahera (*Terminalia belerica*), Sukhchain (*Pongamia glabra*), Maulsari (*Mimusop elengi*) and Amaltas or Indian laburnum (*Cassiafistula*).

68. **Fauna:** The faunal populace in the Amritsar district is very scanty. Fauna of Amritsar District include nilgai and chinkara, wild hogs, Black partridges in the river-bed, black bucks, Hares, Jackals, wild geese and ducks of various kinds, grey partridges, snipe, common crane, demoiselle crane, black curlew, jack curlew, quail, sand grouse, green pigeons, blue rock-pigeon, the cobra, the echis, the karait, the Russell's viper, the small keel scaled viper (*Echis carinata*) and fresh-water snakes.

Social Profile – Amritsar District

12. Population Distribution

69. As per 2011 Census, Punjab population is 2.77 crores, which shows an increase in the population in comparison with the 2001 Census (2.44 crores). Total population of the Amritsar District is 24.90 lakh in 2011 which was 21.57 lakh in 2001. However, the district population growth shows a down trend in Average Annual Growth Rate (AAGR) of nearly 1.4 percent. As per the census 2011, the total number of HH in the district is 4,88,898. The Average Household (HH) size has reduced from 5.1 (census 2001) to 4.0 (census 2011).

13. Urban and Rural Population

70. The urban population in Punjab during 2001 was 33.9% which has increased to 37.5% in 2011. The urban population in Amritsar District is 51.5% as per 2001 census which is increased to 53.6% in 2011 census. The

71. **Table 6** below presents the Population distribution of the State and the Amritsar District.

Table 6: Population Distribution – Amritsar District

Population Distribution	2001		2011	
	Punjab	Amritsar	Punjab	Amritsar
Area (Sq.km)	50362	2683	50362	2683
Avg HH size	5.6	4	5.0	5.1
Tot Population	24358999	2157040	27743338	2490656
AAGR (1991-2001-2011)	1.8	2.1	1.3	1.4
Tot Urban Population	8262511	1110811	10399146	1334611
Tot Rural Population	16096488	1046209	17344192	1156045
% of Urban Population	33.9	51.5	37.5	53.6

Source: Compiled from Primary Census Abstract, 1991, 2001 and 2011

14. Population Density

72. Population Density of Punjab is 551 per sq.km in 2011. Density of Amritsar is 928 per sq.km in 2011, which is higher than the value of 2001 census (804 Sq.km).

15. Sex Ratio

73. As per 2011 census, the sex ratio of the state is 895 females per 1000 males. Whereas it was 876 females per 1000 males in 2001. In the Amritsar District it was 889 females per 1000 males, which is higher than the 2001 figures (871 females per 1000 males).

16. Literacy Rate

74. The average literacy rate for the Amritsar district is 76.3% as per 2011 census which is higher in comparison to the Punjab state average of 75.8%. The district itself has a considerable growth in the literacy rate in comparison to the 2001 census (70.4%).

17. Work participation Rate

75. As per 2011 census, the Workforce Participation Rate in the Amritsar district is 37 percent, which is slightly higher than Punjab state average of 36 percent. Amritsar District Workforce Participation was 35 percent in 2001 which is now increased to 37 percent.

18. Social Characteristics

76. There is no ST population in the Punjab state. The percentage of the SC in the Punjab state is 32% and the Amritsar district constitutes to 31% (as per 2011 census).The **Table 7** below presents the Demographic status of the Punjab state and the Amritsar district.

Table 7: Social Characteristic – Amritsar District

Social component	2001		2011	
	Punjab	Amritsar	Punjab	Amritsar
Population Density	484	804	551	928
Sex Ratio	876	871	895	889
Literacy Rate	69.7	70.4	75.8	76.3
Workforce Rate	37	35	36	37
% of SC	29	27	32	31

Source: Compiled from Primary Census Abstract, 2001& 2011

(ii) Gurdaspur District

77. The Gurdaspur district is the northern most district of Punjab state. It falls in the Jalandhar division and is sandwiched between river Ravi and Beas. The geographical extent of the area is 2,610sq.km. The district lies between north-latitude 31°36' and 32°34' and east longitude 74°56' and 75°24' and shares common boundaries with Pathankot district in the north, Beas River in the northeast, Hoshiarpur district in the south-east, Kapurthala district in the south, Amritsar district in the south west and Pakistan in the north west.

1. Physiography

78. All the Tehsils of the district namely Gurdaspur, Batala and Dera Baba Nanak are plain and similar to the rest of the Punjab plains in structure. The landscape of the district has varied topography comprising of undulating plain, the flood plains of the Ravi and the Beas and the up land plain. To its south lies an area of about 128sq.km which is highly dissected and is an undulating plain. Its elevation ranges from about 305 to 381 metre above sea level. It is traversed by a number of streams and has an undulating topography.

79. The flood plains of the Ravi and the Beas are separated from the up land plain by sharp river cut bluffs. They are low lying, with slightly uneven topography. Sand dominates in the soil structure of the flood plains, but it diminishes in both quantity and coarseness in the upland plain. The up land plain covers a large part of the district particularly. Its elevation ranges from about 305 metre above sea level in the north-east to about 213 metre above sea level in the south west, with a gentle gradient of about 1 metre to 1.6 km. This is the most important physiographic unit in the district.

2. Climate

80. There are mainly two seasons i.e. summer and winter. The summer season falls between the months of April to July and the winter November to March. In summer season the temperature touches 45°C and sometimes even cross it. June is the hottest month and January is the coldest one. Mostly the rain falls in the month of July. The winter rains are experienced during January and February. The dust storm occurs in the month of May and June. Relative humidity is generally high in the mornings, and it generally exceeds 70%, except during the summer season when it is less than 50%. The humidity is comparatively less in the afternoons. The driest part of the year is the summer season when the relative humidity in the afternoons is about 25% or less.

81. Winds are generally light with some strengthening in the summer and early part of the monsoon season. In the post-monsoon and cold season, winds are light and variable in direction in the morning and mostly from the west or north-west in the afternoons. In April and May, winds are mainly from direction between north-west and north-east in the mornings and between west and north-east in the afternoons. By June, easterlies and south – easterlies also blow and also during the south-west monsoon season. Winds blow commonly between north-east and south-east directions.

3. Rainfall

82. The south-west monsoon generally arrives in district in the first week of July and continues up to the end of August. About 70% of the rainfall in the district is received during the period from June to September and as much as about 18 percent rainfall occurs during the period from December to February.

4. Soil

83. The soils are loamy and the clay content is below 10%. They contain small quantities of lime but the magnesia content is high. They are well supplied in potash and phosphoric acid but their quantities are low. Agriculture is dependent to a large extent on the nature of its soils which in turn, is influenced mainly by climatic factors. The soil of the district is quite alluvial and fertile. The district consists of three kinds of soils: Riarki, Bangar and Bet. The area of Dhariwal Ghuman, Qadian, Harchowal and Sri Hargobindpur is called Riarki. The western side of Kahnuwan Lake up to Aliwal canal is called Bangar and the area between the rivers of Beas and Ravi is known as Bet. Nearly 300 villages fall within Bet Area.

5. Geology

84. The area forms a part of the Indo-Ganga alluvium, with a north-west-south-east running hilly terrain of the Shiwaliks forming the foot-hills of the Himalayas. The oldest rocks belong to the lower Shiwalik formation comprising of alternating sandstone, silt and shale

horizons of grey and maroon colours. To the south-west of the Shiwalik range are exposed gravel, sand and clay beds of the quaternary period. Vertebrate fossils are noticed associated with the Shiwalik formations indicating a luxurious growth of animal life which later perished due to severe glaciation during the upper Pleistocene period.

6. Surface Water Quality

85. Beas and Ravi Rivers account for surface waters in Gurdaspur districts. The rivers flood during the rainy season. All through the course of River Beas, a strip of shallow alluvial soil fringes its bank which is subject to inundation during the rainy season. The main channel of the river is broad, dotted with islands and wide pools. The depth of water varies from about 1.5 metres during the dry season to about 4.5 metres during the rainy season. The Chakki Khad is the chief tributary of the Beas in Gurdaspur district. A number of tributaries join River Ravi from both sides. On its right bank, River Ravi is joined by the Ujh, the Jalalia, the Shingarwan and the Masto, all of which originates in the Jammu hills. The Kiran and the Naumuni streams, which take their origin from local depression in Gurdaspur district, are its left bank tributaries.

Table 8: Beas and Ravi Rivers Surface Water Quality

Sl.no	Parameter	Beas River	Ravi River
1.	Temperature (degrees C)	16	14
2.	pH	7.8	7.8
3.	Conductivity (micro siemens/cm)	342	202
4.	Total N (mg/l)	1.4	0.4
5.	DO (mg/l)	7.8	9
6.	BOD.(mg/l)	4.2	0.4
7.	COD. (mg/l)	14.4	1.6
8.	Chloride (mg/l)	23	10
9.	Sulphate (mg/l)	16	8
10.	Sodium (mg/l)	14.6	1.8
11.	Faecal Coliforms (MPN / 100ml)	500	0
12.	Turbidity (NTU)	24	7
13.	Total Coliforms (MPN / 100ml)	5000	7
14.	TDS (mg/l)	302	194

Source: DDMP, Gurdaspur

86. From the given information, with exemption to the Total Coliforms in River Ravi, all other physicochemical parameters for both the river waters are well within the limits (CPCB Norms for Surface Waters) for surface water quality. The presence of the total coliforms indicates the sewerage inlet into the river.

7. Groundwater Quality

87. The ground water in the Gurdaspur district is alkaline in nature with low mineralisation. The pH value ranges from 7.77 to 8.25 indicating a weak base type characteristic. Specific conductance, a measure of total dissolved solids present in water; ranges from 235 to 1640 micromhos/cm at 25°C. Chloride values in the area are directly proportional to the specific conductance of the water samples. The fluoride concentration in the entire district is within the permissible limit of 1.5mg/l of BIS drinking water standards and it ranges from 0.12 to 1.16mg/l. Nitrate values are below the permissible limit with an exception at two villages, i.e. Batala (138mg/l) and Kalanaur (146mg/l).Iron, essential for plant and animal growth, is below 1.0mg/l in the entire district. Arsenic above the prescribed BIS permissible limit of 0.01mg/l is found in well waters located at Nishayra (0.015mg/l), Behrampur (0.0113mg/l), Galri (0.0201mg/l) and Sri Hargobindpur (0.010mg/l).

8. Ambient air Quality

88. Under the NAMP program (National Ambient Air Quality Monitoring Program) conducted by the Central Pollution Control Board (CPCB), New Delhi all the state pollution control boards are requested to conduct the ambient air quality monitoring for the selected industrial and residential areas. In Punjab, the Punjab Pollution Control Board has taken the initiative to conduct NAAQM program. The monitored results are shared by preparing the overall air quality status report. For this assignment, the air quality information for the Gurdaspur area has been taken from the status report for discussion.

Table 9: National Ambient Air Quality Monitoring Programme (NAMP)

Timing	Commercial Area, Gurdaspur			Residential Area, Gurdaspur			Industrial Area, Gurdaspur		
	SPM ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_X ($\mu g/m^3$)	SPM ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_X ($\mu g/m^3$)	SPM ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NO_X ($\mu g/m^3$)
Standards	**500**	**120**	**120**	**200**	**80**	**80**	**500**	**120**	**120**
10 AM - 6 PM	760	20	38	488	15	24	512	24	38
10 AM - 6 PM	-	18	33	-	30	17	-	35	23

Source: NAMP Report, CPCB, Delhi

89. It is observed from the analysis, that the key noxious air pollutants like sulphur di-oxide and oxides of nitrogen are well within the permissible limits set by the CPCB. However, the concentration of SPM is relatively high in comparison with the standard. This may be due to the moving traffic and other anthropogenic activities.

9. Ambient Noise Quality

90. Ambient noise quality has been monitored by Punjab Pollution Control Board Pollution (PPCB) at various locations, indicating high noise levels arising largely from vehicles. Noise level measures in Batala city of Gurdaspur district ranges from 64 dB to 68 dB.

10. Agriculture

91. The principal kharif crops are paddy, cotton, maize and sugarcane; subsidiary crops are kharif vegetables, such as ladyfinger, cauliflower, tomato, brinjal, cucurbits, kharif pulses and fruits. The principal rabi crops are wheat, gram, barley etc. Wheat, Maize, Rice and Bajra are the important cereals of the state. Wheat dominates the production among overall crop pattern, while cotton is the major cash crop produced. Groundnut, Sugarcane and Potatoes are other crops. The principal rabi oilseeds (sarson, toramira, alsi and toria), and winter vegetables such as peas, turnip, radish, carrots, lobia.

92. In terms of natural vegetation, in the ShahpurKandi range which lies in the hilly tract comprises mainly of the miscellaneous hardwood species and the Chil pine. Where water facilities are available, Shisham, mulberry, eucalyptus and poplar are being planted. Besides mango and mulberry, other fruit trees cultivated in the district include orange and Kinnow Lemon tree.

11. Ecological Resources

93. **Flora** in the project area and nearby places is mostly those related to agricultural crops and few trees like Aam (*Mangifera indica*), Amla (*Emblica officinalis*), Anjir (*Ficus carica)*, Kala siras (*Albizzia lebbeck*), Kadamb (*Anthocephalus indicus*), Nimbu (*Citrus medica*), Babool (*Accia arabica*), Baheda (*Terminalia belerica*), Peepal (*Ficus religiosa*), Shisham (*Delbergia sissoo*), Vilayati babool (*Prosopis juliflora*), Amarbel (*Cuscuta reflexa*), Bans (*Dendrocalamus strictus*), Sugarcane (*Saccharum sp.*), Bel (*Aegle marmelos*), Nashpati (*Pyrus communis*), Neem (*Azadirachta indica*), Amrood (*Psidium guajava*) and Ashok (*Polyalthia longifolia*).

94. **Fauna** of Gurdaspur district includes Nilgai (*Boselaphus tragocamelus*), (*Cynopterus sphinx vahl*), Five stripped palm squirrel (*Funambulus pennanti*), Common mongoose (*Herpestes edwardsi*), Hare (*Lepus nigricollis*), Myna (*Acridotheres tristis*), Blue rock pigeon (*Columba livia*), Woodpecker (*Dinopium benghalense*), Parrot (*Psittacula krameri*), House crow (*Corvus splendens*), Common garden lizard (*Calotes vesicolor*), Dog (*Canis lupus*), Goats (*Capra aegagrus hircus*), Cat (*Felis cattus*), Buffaloes (*Bubalus bubalis*), Toads (*Bufo malanostictus*) and Bull frog (*Rana tigrina*).

Social Profile – Gurdaspur District

12. Population Distribution

95. As per 2011 Census, Punjab population is 2.77 crores, which shows an increase in the population in comparison with the 2001 Census (2.44 crores). Total population of the Gurdaspur District is 22.98 lakh in 2011 which was 21.04 lakh in 2001. However, the district population growth shows a down trend in Average Annual Growth Rate (AAGR) of nearly 0.9 percent. As per the census 2011, the total number of HH in the district is 4,43,666. The Average Household (HH) size has reduced from 5.7 (census 2001) to 5.2 (census 2011).

13. Urban and Rural Population

The urban population in Punjab during 2001 was 33.9% which has increased to 37.5% in 2011. The urban population in Gurdaspur District is 25% as per 2001 census which is increased to 29% in 2011 census.

96. **Table 6**Table 10 below presents the Population distribution of the State and the Gurdaspur District.

Table 10: Population Distribution – Gurdaspur District

Population Distribution	2001		2011	
	Punjab	Gurdaspur	Punjab	Gurdaspur
Area (Sq.km)	50,362	3,551	50,362	3,551
Avg. HH size	5.6	5.7	5.0	5.2
Tot Population	24,358,999	2,104,011	27,743,338	2,298,323
AAGR (1991-2001-2011)	1.8	1.8	1.3	0.9
Tot Urban Pop	8,262,511	535,223	10,399,146	659,319
Tot Rural Pop	16,096,488	1,568,788	17,344,192	1,639,004
% of Urban Population	33.92	25.44	37.48	28.69

Source: Compiled from Primary Census Abstract, 1991, 2001 and 2011

14. Population Density

97. Population Density of Punjab is 551 per sq.km in 2011. Density of Gurdaspur is 647 per sq.km in 2011, which is higher than the value of 2001 census (593 Sq.km).

15. Sex Ratio

98. As per 2011 census, the sex ratio of the state was 895 females per 1000 males. Whereas it was 874 females per 1000 males in 2001. In the Gurdaspur District it was 895 females per 1000 males, which is higher than the 2001 figures (890 females per 1000 males).

16. Literacy Rate

99. The average literacy rate for the Gurdaspur district is 79.9% as per 2011 census which is higher in comparison to the Punjab state average of 75.8%. The district itself has a considerable growth in the literacy rate in comparison to the 2001 census (73.8%).

17. Work participation Rate

100. As per 2011 census, the Workforce Participation Rate in the Gurdaspur district is 33 percent, which is slightly lower than Punjab state average of 36 percent. Gurdaspur District Workforce Participation was 35 percent in 2001 which is now decreased to 33 percent.

18. Social Characteristics

101. There is no ST population in the Punjab state. The percentage of the SC in the Punjab state is 32% and the Gurudaspur district constitutes to 25% (as per 2011 census).The **Table 7**Table 11 below presents the Demographic status of the Punjab state and the Gurdaspur district.

Table 11: Social Characteristic – Gurdaspur District

Social component	2001		2011	
	Punjab	Gurdaspur	Punjab	Gurdaspur
Population Density	484	593	551	647
Sex Ratio	876	890	895	895
Literacy Rate	69.65	73.77	75.84	79.95
Workforce Rate	37.47	33.30	35.67	32.94
% of SC	28.85	24.75	31.94	25.26

Source: Compiled from Primary Census Abstract, 2001& 2011

V. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

102. The assessment for environmental impacts due to the implementation of this subproject has been carried out for the potential impacts envisaged during the various stages of the project planning and implementation:

(i) **Location impacts**. Impacts associated with site selection, including impacts on environment and resettlement or livelihood related impacts on communities and wildlife
(ii) **Design impacts**. Impacts arising from project design, including the technology used, scale of operations, discharge standards etc.
(iii) **Construction impacts**. Impacts resulting from construction activities including site clearance, earthworks, civil works, etc.
(iv) **O&M impacts**. Impacts associated with the operation and maintenance of the infrastructure built in the project.

103. **Land Acquisition and Resettlement Impacts**. The sites of subproject components are planned to be developed in the government-owned land (PWD, Punjab). However, the chances of land acquisition and resettlement impacts may arise if the subproject interventions require additional land for widening options, which is beyond the existing Right of Way (RoW). In the event of any land acquisition or resettlement requirements during the project implementation, the same shall be carried out in line with the provisions of the Resettlement Framework developed for the project and will be detailed in the Social Assessment Report.

104. **Design considerations to avoid environmental impacts.** The following are design considerations to avoid environmental impacts:

- Incorporation of adequate drainage provisions
- Adoption of design compatible with the natural environment and suitable selection of materials to enhance the aesthetic appeal and blend with the natural surroundings.
- Straight lines and simple geometry in the proposed design, landscape and architectural features.
- Use of subtle colours and simple ornamentation in the structures.

- Natural tree species in the proposed landscape/ green belt along the last mile connectivity to the tourist destinations.
- Use of local stone in the proposed walkways and built structures thus maintaining a rustic architectural character.

105. The results of interventions are unobtrusive and will be integral part of the ambience of the site. The physical components have been proposed with minimalist design treatment emphasising use of local materials (wood, stone, etc.).

A. Assessment of Environmental Impacts

106. **Determination of Area of Influence.** The primary impact for subproject Package No. Package No. PB/ IDIPT/ T3/ 10/ 14 the proposed site available for the construction of project components. In the case of this subproject Package No. PB/ IDIPT/ T3/ 10/ 14 will be advertised in Q 4 2015 and the components will involve straight forward construction and operation, and impacts will be mainly localized, short in duration and expected only during construction period

B. Pre-construction Impacts and Mitigation Measures

107. **Consents, permits, clearances, no objection certificate (NOC), etc**. All the consents, permits, clearances and NOCs shall be obtained during detailed design and prior to the start of work. Failure to obtain necessary consents, permits, NOCs, etc. can result in design revisions and/or stoppage of works.The following will be conducted during detailed design phase:

- Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.
- Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc.
- Include in detailed design drawings and documents all conditions and provisions if necessary.
  All required NoCs and undertakings have been obtained an enclosed at Annexure 3.

Table 12: Status of NoCs and Undertakings

S. No.	Subproject Component	Asset Owner	Date	NoC/ Undertaking
1.	No Objection Certificate and Undertaking for Operation and Maintenance of Approach Road Samadh Jarnail Sardar Shyam SIngh Attari	Department of Punjab Mandi Board, Executive Engineer, Mandi Board, Amritsar.	August 2014	Obtained
2.	No Objection Certificate and Undertaking for Operation and Maintenance of Link road Attari to Pul Kanjri	Director, Cultural Affairs Archaeology & Museums, Punjab, Chandigarh	August 2014	Obtained
3.	No Objection Certificate and Undertaking for Operation and Maintenance of Chheharta Dhand Bir Sahib road	Sub Divisional Engineer, Construction Sub division No. 1, PWD Amritsar.	August 2014	Obtained

108. **Erosion control.** Most of the impacts will occur due to excavation and earth movements during construction phase. Prior to commencement of civil works, the contractor will be required to:

- Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality.
- Minimize the potential for erosion by balancing cuts and fills to the extent feasible.
- Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure).
- Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal.

109. **Utilities.**Interruption of services (water supply, toilets, bathing areas, etc.) will be scheduled and intermittently related to localized construction activities. To mitigate impacts, PIU/DSC will:

- Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase.
- Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.
- Require contractor to obtain from the PIU and/or DSC the list of affected utilities and operators;
- If relocations are necessary, contractor along with PIU will coordinate with the providers to relocate the utility

110. **Social and Cultural Resources.** There is a risk that any work involving ground disturbance can uncover and damage archaeological and historical remains. Although no such sites have been identified. For this subproject, excavation will occur in and around existing sites, RoWs and specified government land so no risk is foreseen to these structures. Nevertheless, the PIU/DSC will:

- Consult Archaeological Survey of India and/or State Department of Archaeology to obtain an expert assessment of the archaeological potential of the site.
- Consider alternatives if the site is found to be of medium or high risk.
- Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available.
- Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.

111. **Sites for construction work camps and areas for stockpile, storage and disposal.** The priority is to locate the construction camp; storage and area of stockpile are adjacent/ near to the subproject sites. The contractor will be required to meet the following criteria for the sites:

- Will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc.
- Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime).

- Disposal will not be allowed in to nearby water course or any nearby sensitive areas which may pollute surface water or can inconvenience the community.
- The construction camp, storage of fuel and lubricants should be avoided at the river bank. Any construction camp site will be finalized in consultation with DSC and PIU.

112. **Sources of construction materials.** Significant amounts of gravel, sand, and cement will be required for this subproject. Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. The contractor will be required to:

- Use quarry sites and sources permitted by government.
- Verify suitability of all material sources and obtain approval from PIU/DSC.
- If additional quarries are required after construction has started, obtain written approval from PIU/DSC.
- Submit to PIU/DSC on a monthly basis documentation of sources of materials.
- It will be the construction contractor's responsibility to verify the suitability of all material sources and to submit NOCs/approvals of the quarry sites and obtain the approval of PIU/DSC. If additional quarries are required after construction is started, then the contractor should obtain written approval of PIU.

113. **Access.** Hauling of construction materials and operation of equipment on-site can cause traffic problems and conflicts in ROWs. Construction traffic will access most work areas from the existing roads therefore potential impacts will be of short-duration, localized and can be mitigated. The contractor will need to adopt the following mitigation measures:

- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
- Schedule transport and hauling activities during non-peak hours.
- Locate entry and exit points in areas where there is low potential for traffic congestion.
- Keep the site free from all unnecessary obstructions.
- Drive vehicles in a considerate manner.
- Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours.
- Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints.
- Provide free access to households and businesses/shops along the ROWs during the construction phase.

114. Summary of pre-construction activities is presented in **Table 13**. The responsibilities, monitoring program and costs are provided in detailed in the EMP. The contractor is required to update the information during detailed design phase. Sample waste/spoils management plan, traffic management plan, etc. are attached as **Annexes 4 & 5**. Site-specific plans will be developed as per detailed design.

Table 13: Summary of Pre-Construction Mitigation Measures

Parameters	Mitigation Measures
Consents, permits, clearances, no objection certificate (NOC), etc.	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. • Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. • Include in detailed design drawings and documents all conditions and provisions if necessary
Erosion control	• Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality. • Minimize the potential for erosion by balancing cuts and fills to the extent feasible. • Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure). • Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.
Utilities	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase. • Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Obtain from the PIU and/or DSC the list of affected utilities and operators; • Prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • If relocations are necessary, contractor will coordinate with the providers/ concern department to relocate the utility.
Social and Cultural Resources	• Consult Archaeological Survey of India or State Department of Archaeology to obtain an expert assessment of the archaeological potential of the site. • Consider alternatives if the site is found to be of medium or high risk. • Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. • Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.
Sites for construction work camps, areas for stockpile, storage and disposal	• Will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc. • Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). • Disposal will not be allowed near sensitive areas which will inconvenience the community. • Disposal will not be allowed in nearby river to check water

Parameters	Mitigation Measures
	pollution • The construction camp, storage of fuel and lubricants should be avoided at the river bank. The construction camp site for intake well should be finalized in consultation with DSC and PIU.
Sources of construction materials	• Use quarry sites and sources permitted by government. • Verify suitability of all material sources and obtain approval from PIU/DSC. • If additional quarries are required after construction has started, obtain written approval from PIU/DSC. • Submit to PIU/DSC on a monthly basis documentation of sources of materials.
Access	• Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Schedule transport and hauling activities during non-peak hours. • Locate entry and exit points in areas where there is low potential for traffic congestion. • Keep the site free from all unnecessary obstructions. • Drive vehicles in a considerate manner. • Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours. • Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints. • Provide free access to households and businesses/shops along ROWs during the construction phase.

C. Anticipated Construction Impacts and Mitigation Measures

115. **Construction Schedule and Method.** As per preliminary design, construction activities will cover 24 months. The exact implementation schedule will be updated during detailed design phase and will be reflected in this IEE. The infrastructure will be constructed manually according to design specifications. Excavations and trenches, if required, will be dug by small backhoe diggers supplemented by manual digging where necessary. Excavated soil will be placed nearby. Excavated materials will be reused to the maximum extent possible. Materials will be brought to site by trucks and will be stored on unused areas within sites and nearby vacant areas. Any excavated road will be reinstated. The working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. Night works may be considered in commercial areas and high day-time traffic.

116. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the subproject sites in built-up areas where there are a variety of human activities, will result to impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are short-term, site-specific and within relatively small areas.

117. **Erosion Hazards.**As per the reconnaissance survey, the risks involved due to erosion in the project area is low and limited during the construction phase and are not expected to have any negative impact on the drainage and hydrology of the project area. Runoff will produce a highly variable discharge in terms of volume and quality, and in most instances will have no discernible environmental impact. The contractor will be required to:

- Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so.
- Use dust abatement such as water spraying to minimize windblown erosion.
- Provide temporary stabilization of disturbed/excavated areas that are not actively under construction.
- Apply erosion controls (e.g., silt traps) along the drainage leading to the water bodies.
- Maintain vegetative cover within unused land to prevent erosion and periodically monitor the area to assess erosion.
- Clean and maintain catch basins, drainage ditches, and culverts regularly.
- Conduct routine site inspections to assess the effectiveness of and the maintenance requirements for erosion and sediment control systems.

118. **Impacts on Water Quality.** Excavated materials may end up in drainages and water bodies adjacent to the subproject sites, particularly during monsoon season. Other risks of water pollution may be caused by: (i) poorly managed construction sediments, wastes and hazardous substances; and (ii) poor sanitation practices of construction workers. The contractor will be required to:

- Schedule civil works during non-monsoon season, to the maximum extent possible.
- Ensure drainages and water bodies within the construction zones are kept free of obstructions.
- Keep loose soil material and stockpiles out of drains, flow-lines and watercourses.
- Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.
- Re-use/utilize, to maximum extent possible, excavated materials.
- Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites).
- Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.
- Develop a spill prevention and containment plan, educate workers about the plan, and have the necessary materials on site prior to and during construction.
- Refuel equipment within the designated refueling containment area away from drainages, nallahs, or any water body.
- Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation.

119. **Impacts on Air Quality.** There is a potential for increased dust particularly during summer/dry season due to stockpiling of excavated materials. Emissions from vehicles transporting workers, construction materials and debris/materials to be disposed may cause increase in air pollutants within the construction zone. These are inherent impacts which are site-specific, low magnitude, short in duration and can be easily mitigated. The contractor will be required to:

- Conduct regular water spraying on earth piles, trenches and sand piles.
- Conduct regular visual inspection along alignments and construction zones to ensure no excessive dust emissions.
- Spreading crushed gravel over backfilled surfaces if re-surfacing of disturbed areas cannot be done immediately.
- Maintain construction vehicles and obtain “pollution under control” certificate from Punjab Pollution Control Board (PPCB).
- Obtain Consent For Establishment and Consent For Operation for hot mix plants, crushers, diesel generators, etc., if to be used in the project.

120. **Noise and Vibration Impacts.** Noise and vibration-emitting construction activities include earthworks, rock crushing, concrete mixing, movement and operation of construction vehicles and equipment, and loading and unloading of coarse aggregates. The significance of noise and vibration impacts will be high in areas where noise-sensitive institutions such as health care and educational facilities are situated. These impacts will be temporary, short-term, intermittent, and expected to be in the range of 80 to 100 dB(A) as per **Table** (typical noise levels of principal construction equipment).

Table 14: Typical Noise Levels of Principal Construction Equipment

CLEARING		**STRUCTURE CONSTRUCTION**	
Bulldozer	80	Crane	75-77
Front end loader	72-84	Welding generator	71-82
Jack hammer	81-98	Concrete mixer	74-88
Crane with ball	75-87	Concrete pump	81-84
		Concrete vibrator	76
EXCAVATION & EARTH MOVING		Air compressor	74-87
Bulldozer	80	Pneumatic tools	81-98
Backhoe	72-93	Bulldozer	80
Front end loader	72-84	Cement and dump trucks	83-94
Dump truck	83-94	Front end loader	72-84
Jack hammer	81-98	Dump truck	83-94
Scraper	80-93	Paver	86-88
GRADING AND COMPACTING		LANDSCAPING AND CLEAN-UP	
Grader	80-93	Bulldozer	80
Roller	73-75	Backhoe	72-93
		Truck	83-94
PAVING		Front end loader	72-84
Paver	86-88	Dump truck	83-94
Truck	83-94	Paver	86-88
Tamper	74-77	Dump truck	83-94

Source: U.S. Environmental Protection Agency. Noise from Construction Equipment and Operations.Building Equipment and Home Appliances.NJID. 300.1. December 31. 1971

121. The contractor will be required to ensure the following:

- The construction activities having excess noise shall be performed during the day time. For the subproject area with heavy traffic and commercial activities, the construction activities shall be planned in the night time.
- Plan activities in consultation with the PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.
- Minimize noise from construction equipment by using vehicle silencers and by fitting jackhammers with noise-reducing mufflers.
- Avoid loud random noise from sirens, air compression, etc.
- Train the drivers to ensure that they do not honk unless it is necessary to warn other road users or animals of the vehicle's approach.
- If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the project manager:
    - Locate stationary construction equipment as far as possible from nearby noise-sensitive areas.
    - Turn off idling equipment.
    - Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
    - Notify nearby residents whenever extremely noisy work are planned.

- Follow Noise Pollution (Regulation and Control) Rules, 2000, day time ambient noise levels should not exceed 65 dB(A) in commercial areas, 55 dB(A) in residential areas and 50 dB(A) in silence zone.[10]
- Ensure vehicles comply with Government of India noise regulations for vehicles. The test method to be followed shall be IS: 3028-1998.

122. **Impacts on Flora and Fauna.** As per preliminary design, tree-cutting is not envisaged for any of the subproject components. However, this will be reassessed during detailed design phase. There are no protected areas in the direct and indirect impact zones and no diverse ecological biodiversity such as vegetation and domesticated animals found in the construction zones are mostly common in built up/urban areas. The contractor will be required to:

- Conduct site induction and environmental awareness.
- Limit activities within the work area.
- Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut, if any. Replacement species must be approved by District Forest Department.

123. **Impacts on Physical Cultural Resources.** There may be inconvenience to tourists, residents, businesses, and other road users due to construction activities in the proposed area. This potential impact is site-specific, short-term and can be mitigated. The contractor will be required to:

- Ensure no damage to structures/properties near construction zone.
- Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/complaints.
- Implement good housekeeping. Remove wastes immediately. Prohibit stockpiling of materials that may obstruct/slow down pedestrians and/or vehicle movement.
- Ensure workers will not use nearby/adjacent areas as toilet facility.
- Coordinate with DSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc.
- Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
- Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.

124. **Impact due to Waste Generation.** Construction activities will produce excavated soils, construction materials, and solid wastes (such as removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items). These impacts are negative but short-term and reversible by mitigation measures. The contractor will need to adopt the following mitigation measures:

- Prepare and implement a waste management plan. Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas.
- Coordinate with Local Municipal Authority for beneficial uses of excavated soils/silts/sediments or immediately dispose to designated areas.
- Recover used oil and lubricants and reuse; or remove from the sites.

[10] Day time shall mean from 6.00 am to 10.00 pm. Silence zone does an area comprise not less than 200 meters around eco sensitive areas, hospitals, educational institutions, courts, religious places or any other area which is declared as such by PPCB. Mixed categories of areas may be declared as one of the above mentioned categories.

- Avoid stockpiling and remove immediately all excavated soils, excess construction materials, and solid waste (removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items).
- Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.

125. **Impacts on Occupational Health and Safety.** Workers need to be mindful of occupational hazards which can arise from construction works. Exposure to work-related chemical, physical, biological and social hazard is typically intermittent and of short duration, but is likely to reoccur. Potential impacts are negative and long-term but reversible by mitigation measures. Overall, the contractor should comply with IFC EHS Guidelines on Occupational Health and Safety (this can be downloaded from http://www1.ifc.org/wps/wcm/connect/9aef2880488559a983acd36a6515bb18/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES). The contractor will be required to:

- Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.
- Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project.
- Include in H&S plan measures such as: (i) type of hazards during excavation works; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents.
- Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers.
- Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps.
- Provide medical insurance coverage for workers.
- Secure construction zone from unauthorized intrusion and accident risks.
- Provide supplies of potable drinking water.
- Provide clean eating areas where workers are not exposed to hazardous or noxious substances.
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted.
- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.
- Ensure moving equipment is outfitted with audible back-up alarms.
- Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.

126. **Impacts on Socio-Economic Activities.** Manpower will be required during the 24months construction phase. This can help generate contractual employment and increase in local revenue. Thus potential impact is positive and long-term. As per preliminary design, land acquisition and closure of roads are not required; therefore no negative impact is expected. However, the contractor will need to adopt the following mitigation measures:

- Leave space for access between mounds of soil.
- Provide walkways and metal sheets where required to maintain access to shops/businesses along trenches.
- Consult businesses and institutions regarding operating hours and factoring this in to work schedules.
- Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
- Employ at least 50% of the labor force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available.

127. **Summary of Mitigation Measures during Construction. Table** provides summary of mitigation measures to be considered by the contractor during construction phase. The detailed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related implementation arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators are provided in the EMP.

Table 15: Summary of Mitigation Measures during Construction Phase

Potential Impact	Mitigation Measures
Erosion hazards	• Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so. • Use dust abatement such as water spraying to minimize windblown erosion. • Provide temporary stabilization of disturbed/excavated areas that are not actively under construction. • Apply erosion controls (e.g., silt traps) along the drainage leading to the water bodies. • Maintain vegetative cover within road RiofWs to prevent erosion and periodically monitor ROWs to assess erosion. • Clean and maintain catch basins, drainage ditches, and culverts regularly. • Conduct routine site inspections to assess the effectiveness of and the maintenance requirements for erosion and sediment control systems.
Impacts on water quality	• Schedule civil works during non-monsoon season, to the maximum extent possible. • Ensure drainages and water bodies within the construction zones are kept free of obstructions. • Keep loose soil material and stockpiles out of drains, flow-lines and watercourses. • Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets. • Re-use/utilize, to maximum extent possible, excavated materials. • Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites). • Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989. • Develop a spill prevention and containment plan, educate workers about the plan, and have the necessary materials on site prior to and during construction. • Refuel equipment within the designated refueling containment area away from drainages, nallahs, or any water body.

Potential Impact	Mitigation Measures
	• Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation.
Impacts on air quality	• Conduct regular water spraying on earth piles, trenches and sand piles. • Conduct regular visual inspection along alignments and construction zones to ensure no excessive dust emissions. • Spreading crushed gravel over backfilled surfaces if re-surfacing of disturbed ROWs cannot be done immediately. • Maintain construction vehicles and obtain “pollution under control” certificate from PPCB. • Obtain CFE and CFO for hot mix plants, crushers, diesel generators, etc., if to be used in the project.
Noise and vibrations impacts	• The construction activities having excess noise shall be performed during the day time. For the subproject area with heavy traffic and commercial activities, the construction activities shall be planned in the night time. • Plan activities in consultation with the PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. • Minimize noise from construction equipment by using vehicle silencers and by fitting jackhammers with noise-reducing mufflers. • Avoid loud random noise from sirens, air compression, etc. • Train the drivers to ensure that they do not honk unless it is necessary to warn other road users or animals of the vehicle’s approach. • If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the project manager: • Locate stationary construction equipment as far as possible from nearby noise-sensitive areas. • Turn off idling equipment. • Reschedule construction operations to avoid periods of noise annoyance identified in the complaint. • Notify nearby residents whenever extremely noisy work are planned. • Follow Noise Pollution (Regulation and Control) Rules, 2000, day time ambient noise levels should not exceed 65 dB(A) in commercial areas, 55 dB(A) in residential areas and 50 dB(A) in silence zone.11 • Ensure vehicles comply with Government of India noise regulations for vehicles. The test method to be followed shall be IS:3028-1998.
Impacts on flora and fauna	• Conduct site induction and environmental awareness. • Limit activities within the work area. • Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut, if any. Replacement species must be approved by District Forest Department.
Impacts on physical	• Ensure no damage to structures/properties near construction zone. • Provide sign boards to inform nature and duration of construction

[11] Day time shall mean from 6.00 am to 10.00 pm. Silence zone does an area comprise not less than 200 meters around eco sensitive areas, hospitals, educational institutions, courts, religious places or any other area which is declared as such by PPCB. Mixed categories of areas may be declared as one of the above mentioned categories.

Potential Impact	Mitigation Measures
resources	works and contact numbers for concerns/complaints. • Implement good housekeeping. Remove wastes immediately. Prohibit stockpiling of materials that may obstruct/slow down pedestrians and/or vehicle movement. • Ensure workers will not use nearby/adjacent areas as toilet facility. • Coordinate with PIU/DSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc. • Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.
Impacts on waste generation	• Prepare and implement a waste management plan. Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas. • Coordinate with Town Municipal Authority for beneficial uses of excavated soils/silts/sediments or immediately dispose to designated areas. • Recover used oil and lubricants and reuse; or remove from the sites. • Avoid stockpiling and remove immediately all excavated soils, excess construction materials, and solid waste (removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items). • Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.
Impacts on occupational health and safety	• Comply with IFC EHS Guidelines on Occupational Health and Safety • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. • Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project. • Include in H&S plan measures such as: (i) type of hazards during excavation works; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents. • Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers. • Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps. • Provide medical insurance coverage for workers. • Secure construction zone from unauthorized intrusion and accident risks.

Potential Impact	Mitigation Measures
	• Provide supplies of potable drinking water. • Provide clean eating areas where workers are not exposed to hazardous or noxious substances. • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted. • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas. • Ensure moving equipment is outfitted with audible back-up alarms. • Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.
Impacts on socio-economic activities	• Leave space for access between mounds of soil. • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints. • Employ at least 50% of the labor force, or to the maximum extent, local persons within the 2km immediate area if manpower is available. • “Mobility Plan” has to be chalked out in consultation with the District Administration prior to start of work.

128. The construction related impacts due to proposed subproject components are generic to the road construction activities, and are typical of small-scale construction projects. The potential impacts that are associated with construction activities can be mitigated to standard levels without difficulty through incorporation or application of the recommended mitigation measures and procedures.

C. Post-Construction Impacts and Mitigation Measures

129. Site clean-up is necessary after construction activities. The contractor will be required to:

- Backfill any excavation and trenches, preferably with excess excavation material generated during the construction phase.
- Use removed topsoil to reclaim disturbed areas.
- Re-establish the original grade and drainage pattern to the extent practicable.
- Stabilize all areas of disturbed vegetation using weed-free native shrubs, grasses, and trees.
- Restore access roads, staging areas, and temporary work areas.
- Restore roadside vegetation.
- Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites.
- Monitor success of re-vegetation and tree re-planting. Replace all plants determined to be in an unhealthy condition.
- Request in writing from PIU/DSC that construction zones have been restored.

D. Anticipated Operations and Maintenance Impacts and Mitigation Measures

130. Impacts on environmental conditions associated with the O&M of the subproject Package No. PB/ IDIPT/ T3/ 10/ 14 will be advertised in Q 4 2015 and components pertain to impacts related to increased tourists in the areas resulting to increased vehicular movement along the roads, increased demands for services, and increased solid waste generation. These impacts can be mitigated by:

- Increased vehicular movement along the roads - speed restrictions, provision of appropriate road signage and well located rest points for pedestrians shall minimize impacts on safety of the people
- Increase demands for services – addressed through the subproject design
- Increase solid waste generation – Municipal Corporation to put in place solid waste management programs.

VI. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. ADB Disclosure Policy

131. Public consultation was undertaken as per ADB SPS requirements. All the five principles of information dissemination, information solicitation, integration, coordination and engagement into dialogue were incorporated during the task. A framework of different environmental impacts likely from the subproject was prepared based on opinions of all those consulted, especially at the micro level, by setting up dialogues with the local communities from whom information on site facts and prevailing conditions were collected.

132. As per ADB safeguard requirement, public consultation is to be carried out before and after impact identification. Public consultation was therefore carried out twice, once at the time of start of work with the key stakeholders particularly with wildlife/ forest authorities and NGOs, and secondly to discuss mitigating measures and get concurrence of stakeholders.

B. Process for Consultation Followed

133. During project preparation, consultations have been held with the Forest Department, Village Panchayat, PWD department, NGOs and tourists on issues pertaining to the implementation of the proposed subproject. The key issues highlighted during the discussion are land acquisition and resettlement issues (if any) due to the proposed road upgradation/ strengthening and widening. This also includes discussion with the forest department with regard to the proposed road improvements, which may require cutting of avenue trees. These consultations provides valuable inputs to hasten the decision making process. The outcome of the consultation is given in the Table 16.

Table 16: Stakeholder's Consultation

S.No	Place	Date	Participants	Issues discussed
1.	Gurdaspur	May 2014	Officials of PWD Department, and Village Panchayat	Proposed design elements, Land availability, NOC/ clearance requirements, environment and social policies of ADB.
2.	Chandigarh	May 2014	Officials of Forest Department	Proposed design elements, Tree felling permission. NOC/ clearance requirements, environment and social policies of ADB.
3.	Chandigarh	May 2014	Officials of Tourism Department/ line agencies	Role of Environmental and Social safeguard and the necessity of IEE in the project implementation and in the adopted methodology

C. Plan for Continued Public Participation

134. To ensure continued public participation, provisions to ensure regular and continued stakeholder participation, at all stages during the project design and implementation is proposed. A grievance redressal cell (refer section VII) will be established in PIUs. The process is designed to be transparent, gender responsive, culturally appropriate and commensurate to the risks and adverse impacts of the project, as well as readily accessible to all segments of the affected people. Affected people are to be appropriately informed about the mechanism through media and public outlets. This participatory process will ensure that all views of the people are adequately reviewed and suitably incorporated in the

design and implementation process. Further, to ensure an effective disclosure of the project proposals to the stakeholders and the communities in the vicinity of the subproject locations, extensive project awareness campaigns will be carried out.

135. For the benefit of the community a summary IEE shall be translated in the local language (Punjabi) and made available at: (i) Office of the PMU; and, (ii) Office of the Deputy Commissioner, Amritsar and Gurdaspur Districts. These copies shall be made available free of cost to any person seeking information on the same. Hard copies of the IEE shall be available in the PMU/PIU as well as the district libraries at Amritsar and Gurdaspur, and accessible to citizens as a mean to disclose the document and at the same time creating wider public awareness. On demand, the person seeking information can obtain a hard copy of the complete IEE document such that to cover the cost of photocopy from the office of the PMU/PIU, on a written request and after initiating a payment for the same to the Project Director (PD). Electronic version of the IEE shall be placed in the official website of the Tourism Department and the website of ADB after approval of the documents by Government of Punjab and ADB. The PMU shall issue notification on the disclosure mechanism in local newspapers, ahead of the initiation of implementation of the project, providing information on the project, as well as the start dates etc. The notice shall be issued by the PMU in local newspapers one month ahead of the implementation works. This shall create awareness of the project implementation among the public. Posters designed such that it creates mass awareness regarding the basic tenets of the IEE and the same shall be distributed to libraries in different localities that shall be part of such mass campaign.

VII. GRIEVANCE REDRESS MECHANISM

136. The project affected person/aggrieved party can give their grievance verbally or in written to the local grievances committee. Grievances of affected person will first be brought to the attention of the PIU who can resolve the issue at site level. If the matter is not solved within 7 days period by the PIU, it will be brought to the Grievance Redress Committee constituted for the purpose in PIU. This GRC shall discuss the issue in its monthly meeting and resolve the issues within one month of time after receiving the grievance. If the matter is not resolved by GRC at PIU level within stipulated time, it shall be referred to GRC at PMU level by Executive Engineer of PIU.

137. GRC at PMU shall discuss the issue and try to resolve it and inform the PIU accordingly. If the matter is not resolved by the GRC at PMU level within one month of time, the aggrieved person/party can bring the matter to The Court of Law. The PIU shall keep records of all grievances received including contact details of complainant, date of receiving the complaint, nature of grievance, agreed corrective actions and the date these were affected and final outcome. The grievance redress process is shown below

A. Composition and functions of GRC

138. **Local Grievance Committee (LGC).** In this LGC has worked with NGO, SHG, Line Agency, representative of Gram Panchayat, Special invitee.

139. **Grievance Redress Committee (GRC) at PIU.** In each PIU there shall be one GRC, which will include Project Manager (PIU), District Tourist Officer of the Punjab Heritage & Tourism Promotion Board, Govt. of Punjab, Community Development Officer of PIU, nominated representative of District Magistrate and nominated representative committee shall be headed by Project Manager (PIU). The committee will meet at least once in every month. Agenda of meeting shall be circulated to all the members and affected persons/aggrieved party along with venue, date and time; informed in written at least 7 days in advance of meeting. The matters shall remain with GRC at PIU level for one month and if grievance is not resolved within this time period, the matter shall be referred to GRC at PMU.

140. **GRC within Environmental and Social Management Cell (ESMC) at PMU**. There shall be one GRC in PMU. The matters not resolved by the GRC at PIU level within one month shall come under GRC at PMU. GRC at PMU will include Community Development Expert of PMU, Safeguard Specialist of PMU and Additional Project Director (APD) of PMU. The Committee shall be headed by APD of PMU. This committee shall look the matters, which are referred to and not resolved by GRC at PIU level. If the matter is not resolved by the GRC at PMU level within one month of time, the aggrieved person/party can bring the matter to The Executive Committee/State Level Empowered Committee (SLEC).

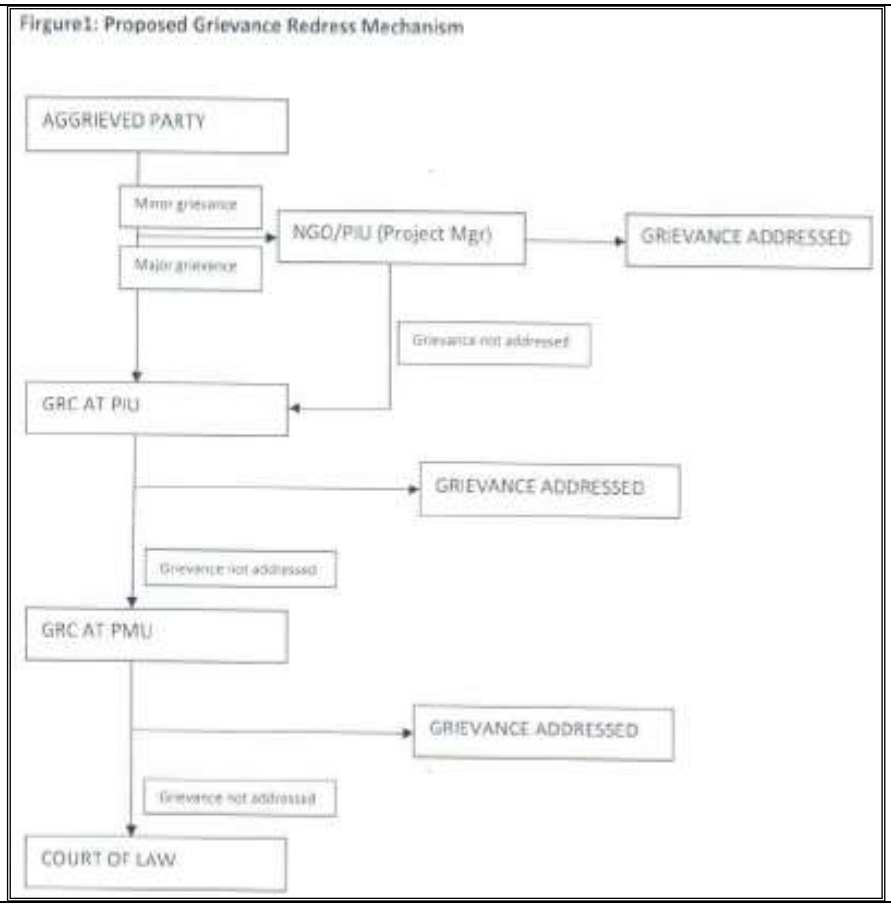


Figure 7: Grievance Redress Mechanism in IDIPT, Punjab

Note: LGC -NGO, SHG, Line Agency, Representative of Gram Panchayat, Special invitee GRC – PM, CDO, Engineer, DFO, DTO, SDM GRC in Environment and Social Management Cell (ESMC) –PMU (APD, SS, CDS, FS), PMC (EE, CDE)

141. **Approach to GRC.** Affected person/aggrieved party can approach to GRC for redress of his/their grievances through any of the following modes:

- Web based: A separate corner will be developed at the program website so that public / community/ affected person can register their complaint in the online column.
- Telecom based: A toll free no. Will be issued by the PMU/ PIU so that general public can register their complaint through telephone / mobile phone to the PIU/PMU office.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

142. The purpose of the Environmental Management Plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with.

143. A copy of the EMP must be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

144. The contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that PMU and PIU will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

A. Responsibilities for EMP Implementation

145. The following agencies will be responsible for EMP Implementation:

- PMU is the Executing Agency (EA) responsible for overall management, coordination, and execution of all activities funded under the loan. Project Implementing Unit (PIU) is the Implementing Agency (IA) responsible for coordinating procurement and construction of the project.
- The Project Management Consultant (PMC) assists PMU in managing the project including procurement and assures technical quality of design and construction;
- The Design and Supervision Consultant (DSC) will prepare the DPR of the project and will carry out construction supervision during project implementation. Their responsibility will also include EMP implementation supervision;
- Project Implementation Unit (PIU) will be established in Amritsar. This PIU will look into progress and coordination of day to day construction works with the assistance of DSC; and
- The contractor will be responsible for execution of all construction works. The contractor will work under the guidance of the PIU Amritsar and DSC. The environmental related mitigation measures will also be implemented by the contractor.

146. The contractor's conformity with contract procedures and specifications during construction will be carefully monitored by the PIU. Safeguard Specialists are deputed in PMU, PMC and DSC, who will monitor the environmental performance of contractors. Terms of References of Safeguards Specialists are given in boxes below.

Box 1: Terms of Reference of Safeguards Specialist – PMU
• Review the IEE document and ensure adequacy under Safeguard Policy Statement, 2009 and identify any areas for improvement. • Ensure that the project design and specification adequately reflect the IEE, co-ordinate the obtaining of requisite environmental clearances for the project • Monitor construction activities to ensure that identified and appropriate control measures are effective and in compliance with the IEE and advise PIU for compliance

Box 1: Terms of Reference of Safeguards Specialist – PMU

with statutory requirements.

- Develop training programme for the PMU/PIUs staff, the contractors and others involved in the project implementation, in collaboration with the Environmental Specialist of the PMC and DSC
- Review and approve the Contractor's Implementation Plan for the environmental measures, as per IEE.
- Liaise with the Contractors and Consultants on the implementation of the Environmental management measures proposed in the IEE
- Liaise with the various Government agencies on environmental and other regulatory matters
- Continuously interact with the NGOs and Community groups to be involved in the project
- Establish dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project.
- Review the environmental performance of the project through an assessment of the periodic environmental monitoring reports submitted by the DSC; provide a summary of the same to the Project Director, and initiate necessary follow-up actions
- Provide support and assistance to the Government Agencies and the Asian Development Bank to supervise the implementation of the IEE during the construction as well as operation stage of the project
- Document the good practices in the project on incorporation and integration of environmental issues into engineering design and on implementing measures in the construction, and dissemination of the same

Box 2: Terms of Reference of Safeguards Specialist of DSC

- Review the IEE document and ensure adequacy under ADB SPS, 2009.
- Interact on a regular basis with the sector specialists of the DSC and integrate environmentally sound practices into the detailed design of project components.
- Advise PMU/PIU for compliance with statutory clearances.
- Work out the site specific mitigation measures for components as required and integrate the same into contractual provisions.
- Develop, organise and deliver environmental training programmes and workshops for the staff of the PIU and Contractors and in accordance to the Capacity Building Programme as specified in the IEE.
- Preparation of Activity Plans as identified in IEE (these include Site Management Plans, Waste Management Plans, Sludge Management and Disposal Plans, Occupational Safety Plans etc).
- Supervise the implementation of the Environmental provisions by the Contractors.
- Review and approve site specific environmental enhancement/mitigation designs worked out by the Contractor. Hold regular consultation meetings with the Environmental specialist of the PMU
- Review the Contractors' Environmental Implementation Plans to ensure compliance with the IEE.
- Develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE.
- Prepare and submit regular environmental monitoring and implementation progress reports.
- Assist Environmental Specialist of the PMU to prepare good practice dissemination notes based on the experience gained from site supervision.

Box 3: Terms of Reference of Safeguards Specialist (Environment) of PMC
Support and Advice the PMU and Consultants team in- • Best Environmental Practices for responding to environmental issues involved with implementation of the projects on a sustainable basis • Assistance and advice on institutional strengthening and capacity building at the PMU and PIU levels in regards to environmental practices. • Ensure that baseline surveys, environmental monitoring plans and programs, initial environmental examinations (IEE) as may be required are carried out. • Preparation of ADB procedure compliant environmental safeguard actions including impact assessment if any during the design stage • Management plan and mitigation measures • Oversight of implementation of environmental standards and safeguards as part of project implementation • Participate in preparation of Master Plan for additional sites and contribute to the environmental safeguards to the plan and sub components • Preparation of performance monitoring reports

147. **Responsibility for updating IEE during detailed design.** DSC will update this IEE during detailed design and submit to PMU for final review before submission to ADB. PMC will assist PMU and coordinate with DSC.

148. **Responsibility for monitoring.** During construction, DSC's Environmental Specialist and the designated representative engineer of the PIU will monitor the contractor's environmental performance on day to day basis while PMC expert will randomly monitor the performance for corrective measures if required. During the operation phase, monitoring will be the responsibility of the PMU/PIU.

149. **Responsibility for reporting.** PIU in coordination with DSC will submit monthly monitoring report to PMU on the basis PMU will submit to ADB semi-annual reports on implementation of the EMP and will permit ADB to field environmental review missions which will review in detail the environmental aspects of the project. Any major accidents having serious environmental consequences will be reported immediately. PMC environmental expert will help in preparing quarterly, semi-annual and annual progress reports. The sample environmental monitoring template is attached as **Appendix 8 to10**.

B. EMP Tables

150. **Table 17** to **Table 19** shows the potential adverse environmental impacts, proposed mitigation measures, responsible parties, and cost of implementation. This EMP will be included in the bid documents and will be further reviewed and updated during implementation.

Table 17: Environmental Management Plan – Pre construction Stage

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
Consents, permits, clearances, no objection certificate (NOC), etc.	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.	Consents, permits, clearance, NOCs, etc.	PMU	EA to report to ADB in environmental monitoring report (EMR)	check CFEs, permits, clearance, prior to start of civil works	PMU
	• Acknowledge in writing and provide report on compliance of all obtained consents, permits, clearance, NOCs, etc.	Records and communications	PMU	EAto report to ADB in EMR	Acknowledge upon receipt Send report as specified in CFE, permits, etc.	PMU
	• Include in detailed design drawings and documents all conditions and provisions if necessary	Detailed design documents and drawings	Contractor	PMU and PMC PIU and DSC	Upon submission by contractor	PMU
Establishment of baseline environmental conditions prior to start of civil works	• Conduct documentation of location of components, areas for construction zone (camps, staging, storage, stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates	Records	PMU	PIU and DSC	to be included in updated IEE report	PMU
Erosion control	• Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality. • Minimize the potential for erosion by balancing cuts and fills to the extent feasible. • Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope	Erosion control and re-vegetation plan covering construction phase	Contractor	PIU and DSC	to be included in updated IEE report	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	angles, and geologic structure). • Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.					
Utilities	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase. • Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Obtain from the PIU and/or DSC the list of affected utilities and operators; • If relocations are necessary, contractor will coordinate with the providers to relocate the utility.	List and maps showing utilities to be shifted Contingency plan for services disruption	- DSC to prepare preliminary list and maps of utilities to be shifted - During detailed design phase, contractor to (i) prepare list and operators of utilities to be shifted; (ii) contingency plan	PIU and DSC	to be included in updated IEE report	DSC – preliminary design stage Contractor – detailed design stage
Social and Cultural Resources	• Consult Archaeological Survey of India (ASI) or Punjab State Archaeology Department to obtain an expert assessment of the	Chance find protocol	- PMC to consult ASI or Punjab State Archaeology	PMU	to be included in updated IEE report	PMU

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	archaeological potential of the site. • Consider alternatives if the site is found to be of medium or high risk. • Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. • Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.		Department - PMC to develop protocol for chance finds			
Sites for construction work camps, areas for stockpile, storage and disposal	• Will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc. • Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). • Disposal will not be allowed near sensitive areas which will inconvenience the community. • The construction camp, storage of fuel and lubricants should be avoided at the river bank. The construction camp site for intake	List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal Waste management plan	- DSC to prepare list of potential sites DSC to inspect sites proposed by contractor if not included in pre-approved sites	PIU/DSC	Monthly	DSC

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	well should be finalized in consultation with DSC and PIU.					
Sources of construction materials	• Use quarry sites and sources permitted by government. • Verify suitability of all material sources and obtain approval from PIU. • If additional quarries are required after construction has started, obtain written approval from PIU. • Submit to DSC on a monthly basis documentation of sources of materials.	Permits issued to quarries/sources of materials	Contractor PMC and DSC to verify sources (including permits) if additional is requested by contractor	PMU/PIU	Upon submission by contractor, monthly	PMC and DSC
Access	• Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Schedule transport and hauling activities during non-peak hours. • Locate entry and exit points in areas where there is low potential for traffic congestion. • Keep the site free from all unnecessary obstructions. • Drive vehicles in a considerate manner. • Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours. • Notify affected sensitive receptors by providing sign boards with	Traffic management plan	Contractor	PIU and DSC	Continuous during construction	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	information about the nature and duration of construction works and contact numbers for concerns/complaints. • Provide free access to households along the alignments of raw and clear water transmission routes during the construction phase.					
Occupational health and safety	• Comply with IFC EHS Guidelines on Occupational Health and Safety • Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project. • Include in H&S plan measures such as: (i) type of hazards in the intake wells site; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents. • Provide medical insurance coverage for workers.	Health and safety (H&S) plan	Contractor	PIU and DSC	Continuous during construction	Contractor
Public consultations	• Continue information dissemination, consultations, and	- Disclosure records	PMC and DSC	PMU and PMC	- During updating of IEE	PMU/PMC/DSC

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring	Source of Funds to Implement Mitigation Measures
	involvement/participation of stakeholders during project implementation.	- Consultations			Report - During preparation of site- and activity-specific plans as per EMP - Prior to start of construction - During construction	

Table 18: Environmental Management Plan –Construction Stage

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Erosion hazards	• Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so. • Use dust abatement such as water spraying to minimize windblown erosion. • Provide temporary stabilization of disturbed/excavated areas that are not actively under construction. • Apply erosion controls (e.g., silt traps) along the drainage leading to the water bodies. • Maintain vegetative cover within road ROWs to prevent erosion and periodically monitor ROWs to assess erosion. • Clean and maintain catch basins, drainage ditches, and culverts	Erosion control and re-vegetation plan	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	regularly. • Conduct routine site inspections to assess the effectiveness of and the maintenance requirements for erosion and sediment control systems.					
Impacts on water quality	• Schedule construction activities during non-monsoon season, to the maximum extent possible.	Work schedule	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Ensure drainages and water bodies within the construction zones are kept free of obstructions.	Visual inspection				
	• Keep loose soil material and stockpiles out of drains and flow-lines.	Visual inspection				
	• Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.	Visual inspection				
	• Re-use/utilize, to maximum extent possible, excavated materials.	condition in waste management plan				
	• Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites).	condition in waste management plan				
	• Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.	condition in waste management plan				
	• Refuel equipment within the designated refueling containment area away from drainages, nallahs,	condition in list of pre-approved sites for				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	or water body.	construction work camps, areas for stockpile, storage and disposal				
	• Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation.	Vehicle inspection report				
Impacts on air quality	• Conduct regular water spraying on stockpiles.	- Visual inspection - No complaints from sensitive receptors - Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during dry season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Conduct regular visual inspection in the construction zones to ensure no excessive dust emissions.	Visual inspection				
	• Maintain construction vehicles and obtain "pollution under control" certificate from PPCB.	PUC certificates				
	• Obtain CFE and CFO for hot mix plants, crushers, diesel generators, etc., if to be used in the project.	CTE and CTO				
Noise and vibrations impacts	• Limit construction activities in temple complexes and other important areas to daytime only. • Plan activities in consultation with PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.	Work schedule	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during noise-	Contractors

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	• Minimize noise from construction equipment by using vehicle silencers and fitting jackhammers with noise-reducing mufflers.	Report on ambient noise level monitoring within direct impact zones			generating activities and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	
	• Avoid loud random noise from sirens, air compression, etc.	zero incidence				
	• Require drivers that horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach.	feedback from receptors within direct and direct impact zone				
	• If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the project manager: • Locate stationary construction equipment as far from nearby noise-sensitive properties, such as the hospital, as possible. • Shut off idling equipment. • Reschedule construction operations to avoid periods of noise annoyance identified in the complaint. • Notify nearby residents whenever extremely noisy work will be occurring.	- Complaints addressed satisfactory - GRM records				
Impacts on flora and fauna	• Conduct site induction and environmental awareness.	Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist	Contractor
	• Limit activities within the work area.	Barricades along excavation				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
		works			- weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	
	• Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut. Replacement species must be approved by District Forest Department.	Number and species approved by District Forest Department				
Impacts on physical and cultural resources	• Ensure no damage to structures/properties adjacent to construction zone.	- Visual inspection - any impact should be addressed by project resettlement plan	ContractorIn coordination with PIU and DSC for any structures within proposed site and construction zone	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/complaints.	- no complaints received - photo-documentation				
	• Increase the workforce near the school and other sensitive receptors.	- Records of workers deployment - Work schedule				
	• Implement good housekeeping. Remove wastes immediately.	- Visual inspection - No stockpiled/ stored wastes				
	• Ensure workers will not use nearby/adjacent areas as toilet facility.	- No complaints received - Sanitation facilities for use of workers				
	• Coordinate with PIU/DSC for	- Approved				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc. • Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.	routes in traffic management plan				
	• Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.	condition in chance find protocol				
Impact due to waste generation	• Prepare and implement a waste management plan. Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas. • Coordinate with PIU/DSC for beneficial uses of excavated soils or immediately disposal to designated areas. • Recover used oil and lubricants and reuse; or remove from the site. • Avoid stockpiling and remove immediately all excavated soils, excess construction materials, and solid waste (removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items).	condition in waste management plan	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	• Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.					
Impacts on occupational health and safety	• Comply with IFC EHS Guidelines on Occupational Health and Safety	- Visual inspection - Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.	- Visual inspection - Work schedule - Noise level monitoring in work area				
	• Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers.	- Records - Condition in H&S plan				
	• Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps.	- Visible first aid equipment and medical supplies - Condition in H&S plan				
	• Provide medical insurance coverage for workers.	Records				
	• Secure construction zone from unauthorized intrusion and accident risks.	- Area secured - Trenches barricaded				
	• Provide supplies of potable drinking water.	- Supply of water				
	• Provide clean eating areas where workers are not exposed to hazardous or noxious substances.	- Workers area				
	• Provide visitor orientation if visitors	- Records				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted.	- Condition in H&S plan				
	• Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.	- Visual inspection - Condition in H&S plan				
	• Ensure moving equipment is outfitted with audible back-up alarms.	- Construction vehicles - Condition in H&S plan				
	• Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.	- Visible and understandable sign boards in construction zone - H&S plan includes appropriate signs for each hazard present				
Impacts on socio-economic activities	• Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	Visible and understandable sign boards in construction zone	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by	Contractor
	• Employ at least 50% of the labor force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available.	Employment records				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
					PMU, PIU, PMC and/or DSC	

Table 19: Environmental Management Plan – Post- construction Stage

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible fo Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Solid waste (debris, excavated soils, etc.)	• Backfill any excavation and trenches, preferably with excess excavation material generated during the construction phase. • Use removed topsoil to reclaim disturbed areas. • Re-establish the original grade and drainage pattern to the extent practicable. • Stabilize all areas of disturbed vegetation using weed-free native shrubs, grasses, and trees. • Restore access roads, staging areas, and temporary work areas. • Restore roadside vegetation, if removed • Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites. • Monitor success of re-vegetation and tree re-planting. Replace all plants determined to be in an unhealthy condition. • Request in writing from PIU/DSC that construction zones have been restored.	Pre-existing condition Construction zone has been restored	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- visual inspection by contractor supervisor and/or environment specialist	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible fo Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Environmental Conditions	• The tourism department /forest department will undertake seasonal monitoring of air, water, noise and soil quality through an approved monitoring agency. • The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the Monitoring Plan prepared.	Punjab Pollution Control Board stipulated environmental monitoring rules and regulations	PMU	PMU	As per Environmental monitoring Plan	PMU
Increased air and noise pollution due to increased traffic using the improved roads	• Smooth and better road surface shall reduce generation of noise. Provision of vegetative barriers where ever possible. Other measures such as improved transport fuel quality, more stringent environmental norms, installation of no horn signages at educational institutes and at hospitals	Punjab Pollution Control Board stipulated environmental monitoring rules and regulations	PMU	PMU	As per Environmental monitoring Plan	PMU
Drainage of roadsides	• To ensure efficient flow of surface water and to prevent water logging along the side of the roads adequate size and number of cross-drainage structures and longitudinal drains are provided in the design. These shall be adequately maintained by cleaning and avoiding clogging of openings	Punjab Water Supply and Sewerage Board (PWSSB) acts and rules	PMU	PMU	Quarterly	PMU
Traffic and Accident Safety	• Depending on the level of Congestion and traffic hazards, traffic management plans shall be prepared • Traffic control measures including speed limits to be enforced strictly • Road control width to be enforced	Traffic management Plan	PMU	PMU	Quarterly	PMU

C. Summary of Site- and Activity-Specific Plans as per EMP

151. **Table 20** summarizes site- and activity-specific plans to be prepared as per EMP tables.

Table 20: Site- and Activity-Specific Plans/Programs as per EMP

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
Detailed Design Phase	Environmental monitoring program as per detailed design	Indicate sampling locations, methodology and parameters	PMC/DSC	Contractor
Detailed Design Phase	Erosion control and re-vegetation plan	Mitigate impacts due to erosion	PMC/DSC	Contractor
Detailed Design Phase	List and maps showing utilities to be shifted	Utilities shifting	DSC during preliminary stage Contractor as per detailed design	Contractor
Detailed Design Phase	Contingency plan	Mitigate impacts due to interruption of services during utilities shifting	Contractor	Contractor
Detailed Design Phase	Chance find protocol	Address archaeological or historical finds	PMC/DSC	Contractor
Detailed Design Phase	List of pre-approved sites	Location/s for work camps, areas for stockpile, storage and disposal	PIU and DSC	Contractor
Detailed Design Phase	Waste management plan	Mitigate impacts due to waste generation	Contractor	Contractor
Detailed Design Phase	Traffic management plan	Mitigate impacts due to transport of materials and pipe laying works	Contractor	Contractor
Detailed Design Phase	H&S plan	Occupational health and safety	Contractor	Contractor
Detailed Design Phase	Spill prevention and containment plan	Mitigate impacts of accidental spills of oil, lubricants, fuels, concrete, and other hazardous materials	Contractor	Contractor

D. Environmental Monitoring Program

152. Through integration of mitigation measures in project design, impacts are mostly insignificant, temporary in nature and can be properly avoided or mitigated by following proposed mitigation measures given in the EMP of this IEE report.

153. **Table** provides the indicative environmental monitoring program which includes relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards, and responsibility. This will be updated during detailed design to ensure EMP and monitoring program is commensurate to the impacts of the subproject.

Table 21: Indicative Environmental Monitoring Program

Sl No	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Standard / Guidelines	Responsibility
1	Air Quality at project road	Construction Stage	SO_2, NO_2, PM_{10}, $PM_{2.5}$	At Six locations at (i) Connectivity from Amritsar to SamadhJarnail Sham Singh, Attari (ii) nearby sensitive area (schools/ hospitals) and (iii) Ram Tirath Temple, Amritsar, (iv)GurudwaraDarbar Sahib, (v) GurudwaraChola Sahib and (iv) nearby sensitive area (schools/ hospitals)	Once in a season (except monsoons) for the entire construction period	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
2	Air Quality at Construction Camp	Construction Stage	SO_2, NO_2, PM_{10}, $PM_{2.5}$	At construction camp location, during construction	Once in a season (except monsoons) for the entire construction period	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
3	Noise Level at Project road	Construction Stage	Equivalent Day & Night Time Noise Levels	At Six locations similar to AAQ	Once in a season during construction stage	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
4	Noise level at Construction Camp	Construction Stage	Free field at 10m from the equipment whose noise levels are to be determined.	At construction camp location, during construction	Once in a season during construction stage	As per PPCB/ CPCB guidelines	Contractor (Through approved Environmental Monitoring Agency)
5	Water quality	Construction stage	TDS, TSS, pH, Hardness	At four locations, preferably at nearby surface water body in the subproject area	Twice a year (pre monsoon and post monsoon) for the entire period of construction	IS: 2296	Contractor (Through approved Environmental Monitoring Agency)
6	Air Quality at Project road	Operation Stage	SO_2, NO_2, PM_{10}, $PM_{2.5}$	At Six locations at (i) Connectivity from Amritsar to SamadhJarnail Sham Singh, Attari (ii) nearby sensitive area (schools/ hospitals) and (iii) Ram Tirath Temple, Amritsar,	Once in a season (except monsoons) for the first 3 years of operation	As per PPCB/ CPCB guidelines	PMU & PIU (Through approved Environmental Monitoring Agency)

Sl No	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Standard / Guidelines	Responsibility
				(iv)GurudwaraDarbar Sahib, (v) GurudwaraChola Sahib and (iv) nearby sensitive area (schools/ hospitals).			
7	Noise Levels at Project road	Operation Stage	Equivalent Day & Night Time Noise Levels	At Six locations similar to AAQ.	Once in a season for the first 3 years of operation	As per PPCB/ CPCB guidelines	PMU & PIU (Through approved Environmental Monitoring Agency)
8	Landscaping Monitoring	Operation Stage	Survival rate of planted trees/ shrubs	Landscaping suggested locations	Thrice in a season for the first 3 years of operation	State Horticulture standards	PMU & PIU (Through Department of Horticulture)

E. Capacity Building

154. The Environmental Specialist of the DSC will provide the basic training required for environmental awareness followed by specific aspects of infrastructure improvement Projects along with Environmental implications for projects. Specific modules customized for the available skill set will be devised after assessing the capabilities of the members of the Training Programme and the requirements of the project. The entire training will cover basic principles of environmental assessment and management; mitigation plans and programmes, implementation techniques, monitoring methods and tools. The proposed training program along with the frequency of sessions is presented in **Table** below. This training program is intended for the entire destination and is not just specific to this package.

Table 22: Training Modules for Environmental Management (Common for Entire Project)

Program	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
A. Pre-Construction Stage					
Sensitization Workshop	Introduction to Environment: Basic Concept of environment Environmental Regulations and Statutory requirements as per Govt. of India and ADB	Tourism / Forest / Roads / Culture Department Officials, Project Director (PD) and Environmental Specialist (ES) of the PMU/PIU	Workshop	½ Working Day	Environmental Specialist of the PMC and DSC
B. Construction Stage					
Module 1	Roles and Responsibilities of officials / contractors / consultants towards protection of environment Implementation Arrangements	Engineers and staff of line depts. of GoP, and PMU/PIU (including the ES)	Lecture / Interactive Sessions	½ Working Day	Safeguards Specialist of the PMC and DSC
Module 2	Monitoring and Reporting System	Engineers and staff of implementing agencies and PMU/ PIU (including ES)	Lecture / Interactive Sessions	½ Working Day	Safeguards Specialist of the PMC and DSC

F. EMP Implementation Cost

155. As part of good engineering practices in the project, there have been several measures as safety, signage, dust suppression, procurement of personal protective equipment, provision of drains, etc. and the costs for which will be included in the design costs of specific subproject. Therefore, these items of costs have not been included in the IEE budget. Only those items that are not covered under budget for construction are considered in the IEE budget.

156. This is a small construction project and it is not expected to cause much significant air, water and noise pollution. The main EMP cost will arise from monitoring of environmental parameters (air, water and noise) and training.

157. The costs of water sprinkling for dust suppression and providing personal protective equipment's to construction workers shall be borne by contractor as part of conditions of contract. In addition, the sources of funds for Mitigation measures during construction stage including those for monitoring during the construction stage are also to be borne by the contractor. These are deemed to be included as part of the contract price amount quoted by the contractor for the works. The cost of components for monitoring during the operation stage and the capacity building costs are to be funded by the PMU. The EMP cost is given in the **Table** below.

Table 23: Indicative EMP Budget

Sl. no	Particulars	Stages	Unit	Rate (INR)	Total number	Cost (INR)
A.	***Mitigation Measures***					
1	Road Construction					
1.1	Silt Fencing	Construction	Per running meter	2000	500	1000,000
1.2	Oil and Grease Trap	Operation	Per Unit	5000	15	75,000
	Sub -Total (A)					**1,075,000**
B.	***Monitoring Measures***					
2	Transportation					
2.1	Air Quality at project road	Construction	Per sample	10000	36	360,000
2.2	Air Quality at Construction Camp	Construction	Per sample	10000	24	240,000
2.3	Air Quality at Project Road	Operation	Per sample	10000	18	180,000
2.4	Noise Level at project road	Construction	Per sample	4000	36	144,000
2.5	Noise Level at Construction Camp	Construction	Per sample	4000	24	96,000
2.6	Noise Levels at project road	Operation	Per sample	4000	18	72,000
2.7	Water Quality (vicinity water bodies)	Construction	Per sample	8000	16	128,000
3	Landscaping		LS			250,000
	Sub -Total (B)					**1,470,000**
C	***Capacity Building***					
1	Sensitization Workshop	Pre-Construction	L.S			150,000
2	Training Session I (Environmental Safeguard)	Pre-Construction	L.S			150,000
3	Training Session II (Social Safeguard)	Pre-Construction	L.S			150,000
	Sub-Total (C)					**450,000**
Total (A+B+C)						**29,95,000**

IX. FINDINGS & RECOMMENDATIONS

158. The proposed components as part of the package are in line with the sub-project selection criteria for the program. The subproject conforms to all GoI and ADB regulations, policies, and standards including all necessary government permits and clearances.

159. As per the EIA notification September 2006 and amendment 2009, the proposed sub project on "Last mile connectivity to cultural sites in western circuits", in Amritsar and Gurdaspur Districts, Punjab" does not require any form of Environmental Clearance. However, the project proponent (Tourism Department) has to obtain the "Consent to Establish " (NOC) with respect to

Air and Water Act from the Punjab Pollution Control Board, Chandigarh. The Contractor has to obtain both “Consent to Establish and Operate” from Punjab Pollution Control Board, Chandigarh for fixing construction equipments/ machineries like Hot mix plant, Batching Plant etc.

160. The proposed sub project is planned/ designed to develop within the land available with the government. However, at few locations, the proposed up gradation/ strengthening may extend beyond the existing Right of Way (RoW), which may lead to land acquisition and R&R issues. In the event of LA and R&R issues, the compensation has to be paid as per the Resettlement Framework prepared for the IDIPT projects.The significance of the environmental impacts shall be moderately high due to the construction related impacts that are envisaged within the settlement areas. It is to be noted that the resultant potential impacts from this subproject can be offset through provision of proven mitigation measures during the design and by adopting good engineering practices during construction and implementation.

161. The specific management measures laid down in the IEE will effectively address any adverse environmental impacts due to the sub-project. The effective implementation of the measures proposed will be ensured through the building up of capacity towards environmental management within the PMU supplemented with the technical expertise of a Safeguards Specialist as part of the DSC Consultants. Further, the environmental monitoring plans provide adequate opportunity towards course correction to address any residual impacts during construction or operation stages.

X. CONCLUSIONS

162. The IEE carried out for the subproject show that the proposed subproject components will result in net environmental benefits, and that any adverse environmental impact can be addressed through proper location, planning and design of the proposed sub-project; control of construction activity and mitigation measures. The EMP provides for mitigation of all identified impacts and the Contract clauses for the environmental provisions will be part of the civil works contracts. Further, the proposed designs have been consulted with the stakeholders and no significant issues requiring redress in terms of environmental safeguards are known to exist at present.

163. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009).

Appendix 1: EMP Contract Clauses

1.0 GENERAL

1.1 The Contractor shall be responsible for implementation of environmental provisions outlined in the EMP, in addition to adhering to all environmental provisions in the applicable specifications for the works will be adhered to as part of good engineering practices.

1.2 All works undertaken towards protection of environmental resources as part of the EMP and as part of good engineering practices while adhering to relevant specifications will be deemed to be incidental to works being carried out and no separate payment will be made unless otherwise specified explicitly. The costs towards environmental management as per EMP unless otherwise provided as a separate head, will be deemed to be part of the BoQ of the project. The scope of works of the contractor towards the implementation of the environmental provisions shall be as follows:

- Abide by all existing environmental regulations and requirements of the Government of India, during implementation,
- Compliance with all mitigation measures and monitoring requirements set out in the Environmental Management Plan (EMP)
- Submission of a method statement detailing how the subproject EMP will be complied with. This shall include methods and schedule of monitoring.
- Monitoring of project environmental performance and periodic submission of monitoring reports.
- Compliance with all measures required for construction activities in sensitive areas, including Protected areas (natural tourism assets) and heritage monuments, in line with the regulatory requirements of these Protected / Heritage areas, and the guidelines set forth in the management plans for these areas, including the necessary archaeological surveys prior to commencement of works, obtaining clearances/permits to excavate & construct in protected areas around ASI sites.
- Compliance of all safety rules at work, and Provision of adequate health and safety measures such as water, food, sanitation, personal protective equipment, workers insurance, and medical facilities.

1.3 The detailed provisions for specific environmental issues are outlined in the EMP table. Key clauses are outlined in the following sections.

2.0 QUARRY AND BORROWING

2.1 The Contractor will identify and seek prior approval of the Engineer for quarrying and borrowing operations. Quarry and borrowing will be carried only from locations approved by the Engineer. Quarrying, if required in the project will be only from approved quarries and no new quarries will be opened for the purpose of the project. Any deviation from the provisions will be immediately notified and approval of the engineer is to be sought.

2.2 The Contractor shall maintain all borrow sites, stockpiles, and spoil disposal areas so as to assure the stability and safety of the works and that any adjacent feature is not endangered, and to assure free and efficient natural and artificial drainage, and to prevent erosion. Stockpiling of materials (topsoil, fill material, gravel, aggregates, and other construction materials) shall not be allowed during rainy season unless covered by a suitable material. Storage on private property will be allowed if written permission is obtained from the owner or authorized lessee.

2.3 Borrow areas and quarries shall be sited, worked, and restored in accordance with the specifications. Spoils shall be disposed of at approved disposal sites prepared, filled, and restored in accordance with the related specification requirements.

2.4 Following excavation for the works, the Contractor shall take all steps necessary to complete drainage and slope protection works in advance of each mining season. Erosion or instability or sediment deposition arising from operations not in accordance with specifications shall be made good immediately by the Contractor at the Contractor's expense. The Contractor shall take all steps necessary to complete drainage in advance of each rainy season in the areas excavated for borrow materials.
2.5 For excavation activities in and around the ASI or state protected monuments, the Contractor shall carry out the same only after duly obtaining permits/licenses for the same in line with the provisions of the legislations governing these activities in monuments.

3.0 PRECAUTIONS FOR PROTECTION OF ENVIRONMENTAL RESOURCES

3.1 The Contractor shall ensure that construction activities do not result in any contamination of land or water by polluting substances.
3.2 Unless otherwise provided in the specifications, the Contractor shall ensure that no trees or shrubs or waterside vegetation are felled or harmed except those required to be cleared for execution of the works. The Contractor shall protect trees and vegetation from damage to the satisfaction of the Engineer.
3.3 The Contractor shall not use or permit the use of wood as a fuel for the execution of any part of the works and to the extent practicable, shall ensure that fuels other than wood are used for cooking and heating in all camps and living accommodations. Any wood soused must be harvested legally, and the Contractor shall provide the Engineer with copies of the relevant permits, if required.
3.4 The Contractor shall take all precautions necessary to ensure that vegetation existing adjacent to the project site is not affected by fires arising from the execution of the contract. Should a fire occur in the natural vegetation or plantation adjacent to the project site for any reason, the Contractor shall immediately suppress it. Areas of forest, shrub, or plantation damaged by fire considered by the Engineer to have been initiated by the Contractor's staff or laborers shall be replanted or otherwise restored.
3.5 The Contractor shall confine operations to the dry season, use silt traps and dispose spoils in locations approved by the Engineer that will not promote instability and result in destruction of property, vegetation, irrigation and water supply. Disposal near wetlands, protected areas, and other areas that will cause inconvenience or deprive local residents of their livelihood shall not be allowed. Acidic and saline spoils shall not be spread into agricultural land.
3.6 The Contractor shall consult with local residents and local government before locating project offices, sheds, and construction plant. The work camps shall not be located near settlements, near drinking water supply intakes, protected areas, or wildlife habitats.
3.7 The Contractor shall maintain ecological balance by preventing felling of trees, water pollution and defacing of natural landscape. The Contractor shall, so conduct his cleaning operations, as to prevent any avoidable destruction, scarring or defacing of natural surroundings in the vicinity of the archaeological site. In respect of ecological balance, the Contractor shall observe the following instructions.
3.8 In the conduct of cleaning activities and operation of equipment, the Contractor shall utilize such practicable methods and devices as reasonably available to control, prevent and otherwise minimize air/noise pollution.

4.0 NOISE AND AIR POLLUTION

4.1 All works shall be carried out without unreasonable noise and air pollution. Subject and without prejudice to any other provision of the Contract and the law of the land and its obligation as applicable, the Contractor shall take all precautions outlined in the EMP to avoid the air and noise pollution.

4.2 The Contractor shall monitor the environmental parameters periodically as specified in the monitoring plan and report to the Engineer.
4.3 The Contractor shall indemnify and keep indemnified the Employer from and against any liability for damages on account of noise or other disturbance created while carrying out the work, and from and against all claims, demands, proceedings, damages, costs, charges, and expenses, whatsoever, in regard or in relation to such liability.

5.0 OCCUPATIONAL HEALTH AND SAFETY DURING CONSTRUCTION

5.1 The Contractor shall, in accordance with the safety and health provisions specified in the EMP, provide workers with a safe and healthy working environment, in the work areas, through application of preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. The borrower/client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by

(i) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances;
(ii) providing appropriate equipment to minimize risks and requiring and enforcing its use;
(iii) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment;
(iv) documenting and reporting occupational accidents, diseases, and incidents; and
(v) having emergency prevention, preparedness, and response arrangements in place.

6.0 POST CONSTRUCTION CLEARANCE

6.1 On completion of work, wherever applicable, the Contractor shall clear away and remove from the sites all constructional plant, surplus materials, rubbish, scaffoldings and temporary works of every kind and leave the whole of the site and works in a clean condition to the satisfaction of the Engineer.
6.2 Construction camp sites post construction shall be cleared as specified in the EMP and handed over to the Owner. It will be ensured by the contractor that the site handed over is in line with the conditions of temporary acquisition signed by both parties.

Appendix 2: REA Checklist

Rapid Environmental Assessment (REA) Checklist

ROADS AND HIGHWAYS

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES), for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: **IDIPT – Punjab:**Last mile connectivity to cultural sites in western circuits.

Sector Division: **SAUW (South Asia Urban Development and Water Division)**

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			The project site does not have any environmental sensitive area
▪ Cultural heritage site		✓	
▪ Protected Area		✓	
▪ Wetland		✓	
▪ Mangrove		✓	
▪ Estuarine		✓	
▪ Buffer zone of protected area		✓	
▪ Special area for protecting biodiversity		✓	
B. Potential Environmental Impacts Will the Project cause			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		✓	
▪ encroachment on precious ecology (e.g. sensitive or protected areas)?		✓	
▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		✓	
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	✓		Guidelines for siting the labor based camps and construction sites and the location criteria needs to be worked out in order to avoid silt run-off and sanitary wastes onto the surface water bodies.

Screening Questions	Yes	No	Remarks
▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	✓		Impacts due to rock crushing will be limited to the existing licensed quarries, those operating with the requisite environmental clearances. These should not be located close to sensitive receptors such as settlements and sensitive land uses as it might cause an increased exposure to air pollution. The increased pollutant concentrations from asphalt processing and batching plants will have a temporary impact. Appropriate siting criteria for these activities needs to be worked out to address these impacts.
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?		✓	Risks related to road construction activity are anticipated; however, it shall be managed / mitigated by adopting good engineering practices through provision of PPE's. Radiological hazards are not anticipated in this sub project interventions.
▪ noise and vibration due to blasting and other civil works?	✓		Blasting will be limited to quarries, where it will be done in accordance with the Indian Blasting Rules. As these quarries are sited away from the inhabited areas, the noise impacts due to blasting activities will be insignificant. Noise impacts from other civil works will be a significant short term impact due to the movement of construction equipment's and its operation.
▪ dislocation or involuntary resettlement of people?	✓		Few stretches may have resettlement issues, if the proposed upgradation extends beyond the existing RoW.
▪ dislocation and compulsory resettlement of people living in right-of-way?	✓		The issue may arise if the proposed upgradation extends beyond the existing RoW. However it may be known after the detailed designing or DPR stage.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		✓	Does not arise
▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?		✓	Does not arise
▪ hazardous driving conditions where construction interferes with pre-existing roads?	✓		As the existing road will be operational during the construction period, hazardous driving conditions will exist. In order to mitigate the same, a proper traffic management plan for regulating the traffic flow, incorporating adequate traffic safety measures and signage's or provisions of alternative routes shall be provided.

Screening Questions	Yes	No	Remarks
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?		✓	To the extent local labour shall be employed for the construction purposes. In absence of the local labours, the construction labourers camp shall be located away from the habitation and from major water bodies. The sewage system for such camps shall be properly designed and built so that no water pollution takes place to any water-body or water course.
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?	✓		Such impacts are likely at construction site locations, around cross-drainage structures and in borrow areas where the flow is stopped for construction of culverts. The project envisages the adoption of good engineering practices that will prevent temporary ponding around the construction sites.
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?		✓	Due to the improved safety conditions, the risks associated with accidental spills and loss of life will be minimized. Improved emergency response systems will ensure that accidental spills, if any, are addressed.
▪ increased noise and air pollution resulting from traffic volume?		✓	There will be an increased exposure to air and noise pollution, but the impact is likely to be insignificant, as the key determinants of the air and noise pollution shall reduce due to improved surface roughness, facilitation of continuous movement at a constant speed without frequent changing of gears, lesser honking which will in turn result in lowering of the pollutant concentrations
▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	✓		Impacts will be limited to sections around water bodies, where the run-off containing oil and grease from the vehicles can enter the water course and pollute them.
▪ social conflicts if workers from other regions or countries are hired?		✓	The proposed sub project will require minimal labourers and the requirement shall be met with the help of local labourers; hence no social conflicts are envisaged.
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	The proposed road construction works requires minimal labourers during the project construction. During operation, public amenities shall be proposed to cater to the population needs arising due to influx of large population.
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		✓	Does not arise
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.		✓	Does not arise

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: IDIPT – Punjab: Last mile connectivity to cultural sites in western circuits.
Sector: SAUW (South Asia Urban Development and Water Division)
Subsector:
Division/Department:

Screening Questions		Score	Remarks[12]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	The proposed sub project is pertaining to upgradation/ strengthening of the existing road. Hence no climatic impacts are anticipated at the regional scale.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	0	Does not arise
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	The construction materials used for this project shall not have any impact on the climate change. However, temporary increase in temperature in the vicinity of the project area may arise during the use of hot mix macadam as pavement material.
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?	0	Does not arise
Performance of project outputs	Would weather/climate conditions and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	Does not arise

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): Low

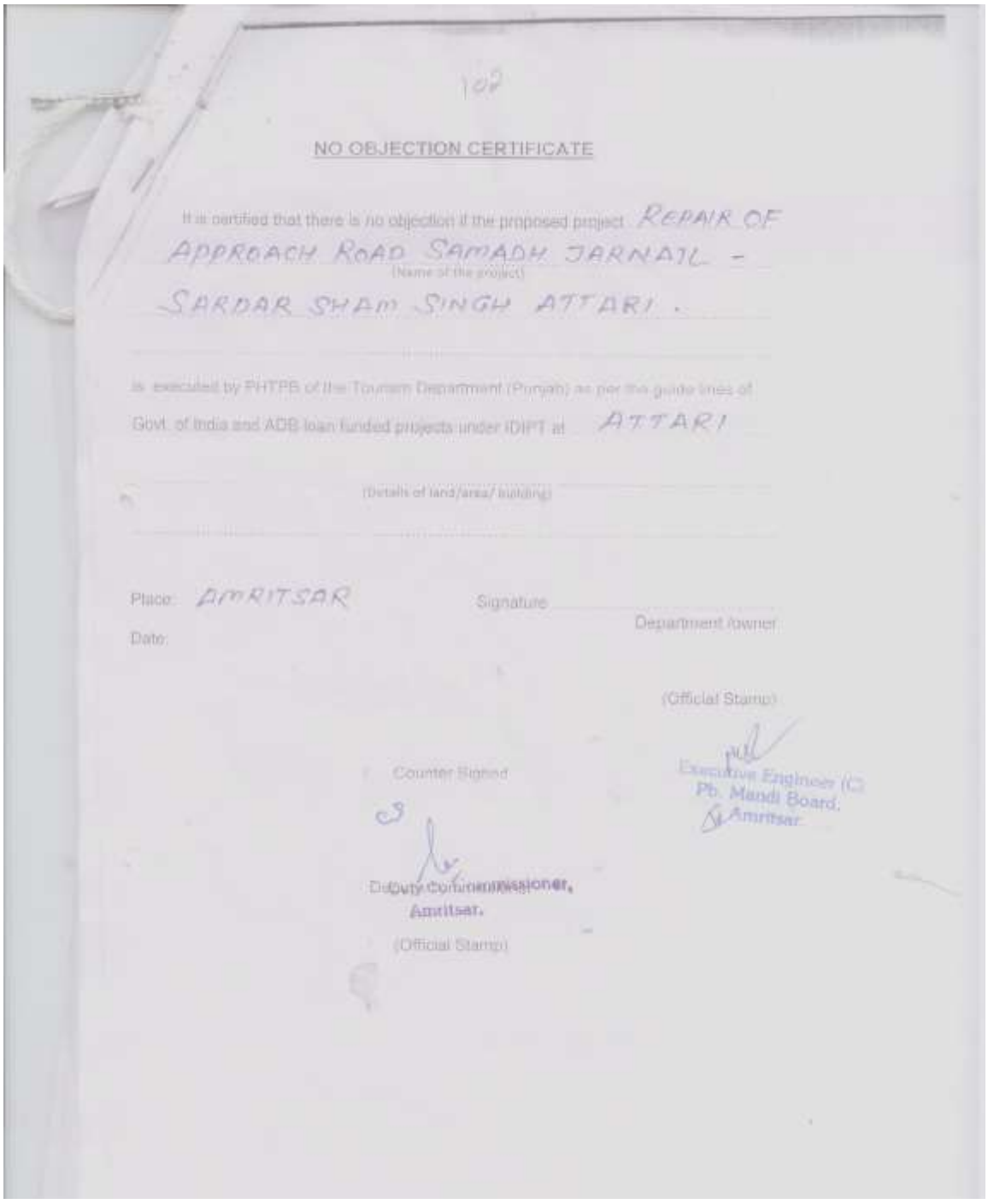
Other Comments: The proposed sub project is upgradation/ strengthening of the approach road to the 5 tourist destinations with landscaping on either side of the approach road. The purpose of this subproject is to provide quality approach road with visitor's facilities to the tourists/ pilgrims. The proposed construction, operation and maintenance of the subproject do not have any impact on the climatic conditions.

Prepared by: Department of Tourism, Punjab

[12] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

APPENDIX 3: NO OBJECTION CERTIFICATE AND UNDERTAKING

No Objection Certificate and Undertaking for Operation and Maintenance of Approach Road Samadh Jarnail Sardar Shyam SIngh Attari



102

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project REPAIR OF APPROACH ROAD SAMADH JARNAIL - SARDAR SHAM SINGH ATTARI .

(Name of the project)

is executed by PHTPB of the Tourism Department (Punjab) as per the guide lines of Govt. of India and ADB loan funded projects under IDIPT at ATTARI

(Details of land/area/ building)

Place: AMRITSAR

Date:

Signature

Department /owner

(Official Stamp)

Executive Engineer (C)
Pb. Mandi Board,
Amritsar.

Counter Signed

Deputy Commissioner,
Amritsar.

(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that :

1. The ATTARI (Details of land/area/ building) Where

the REPAIR OF APPROACH ROAD SAMADH JARNAIL SARDAR SHAM SINGH ATTARI (Name of the project)

project is proposed for execution by PHTPB of the Tourism Department (Punjab) is (Details of the owner) the ownership PUNJAB MANDI BOARD and is under

under the possession of (Details of possessor) Deptt. of PUNJAB MANDI BOARD, AMRITSAR

2. There is NO encroachment and NO resettlement/displacement/rehabilitation of people involved in the above Proposed Project area/building/land.

3. The proposed Project is not Partially/Fully part of any other project funded under any other scheme/programme of the State/Central Govt. or any external funding.

4. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by (Name of the department/organization) Deptt. of PUNJAB MANDI BOARD, AMRITSAR

Place: AMRITSAR Signature

Date: Department/Organisation/Owner

(Official Stamp)

Counter Signed

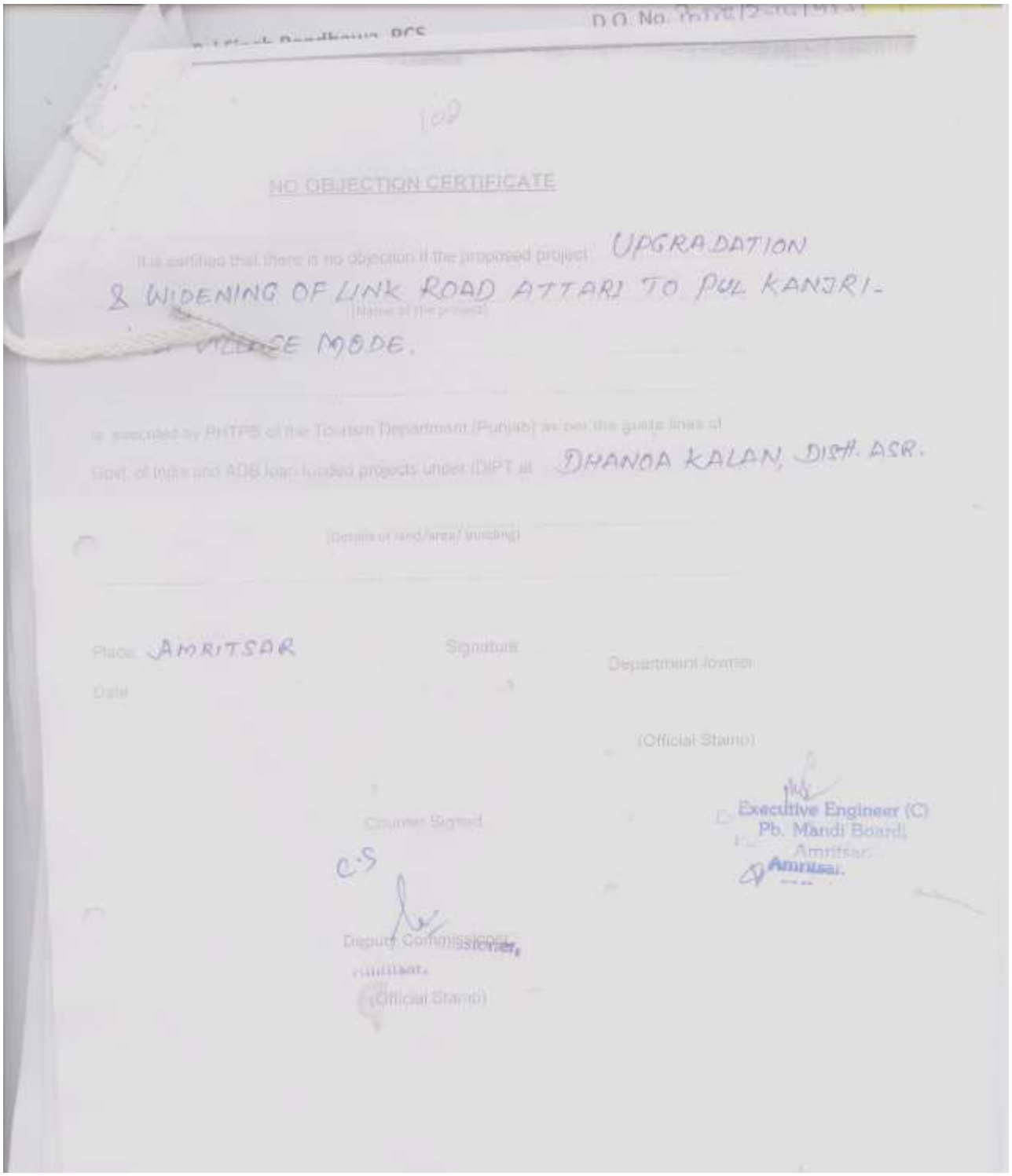
CS

Deputy Commissioner, Amritsar.

(Official Stamp)

Executive Engineer (C)
Pb. Mandi Board,
Amritsar.

No Objection Certificate and Undertaking for Operation and Maintenance of Link road Attari to Pul Kanjri



NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project UPGRADATION & WIDENING OF LINK ROAD ATTARI TO PUL KANJRI- [Name of the project] ...E MODE.

is executed by PHTPB of the Tourism Department (Punjab) as per the guide lines of Govt. of India and ADB loan funded projects under (DIPT at DHANOA KALAN, DISH. ASR. [Details of land/area/ building]

Place: AMRITSAR Signature

Date Department (owner)

(Official Stamp)

Executive Engineer (C)
Pb. Mandi Board,
Amritsar.

Counter Signed

C.S

Deputy Commissioner,
Amritsar.

(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that :

1. The DHANOA KALAN, MODE, & ATTARI
(Details of land/areal building)
the UPGRADATION & WIDENING OF LINK ROAD - Where
(Name of the project)
ATTARI TO PUL KANJRI VIA VILLAGE MODE,
project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under
(Details of the owner)
the ownership PUNJAB MANDI BOARD and is
under the possession of
Deptt. of PUNJAB MANDI BOARD, AMRITSAR
(Details of possessor)

2. There is NO encroachment and NO resettlement/displacement/rehabilitation of people involved in the above Proposed Project area/building/land.

3. The proposed Project is not Partially/Fully part of any other project funded under any other scheme/programme of the State/Central Govt. or any external funding.

4. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by
(Name of the department/organization
Deptt. of PUNJAB MANDI BOARD, AMRITSAR

Place: AMRITSAR

Date:

Signature .....

Department/Organisation/Owner

(Official Stamp)

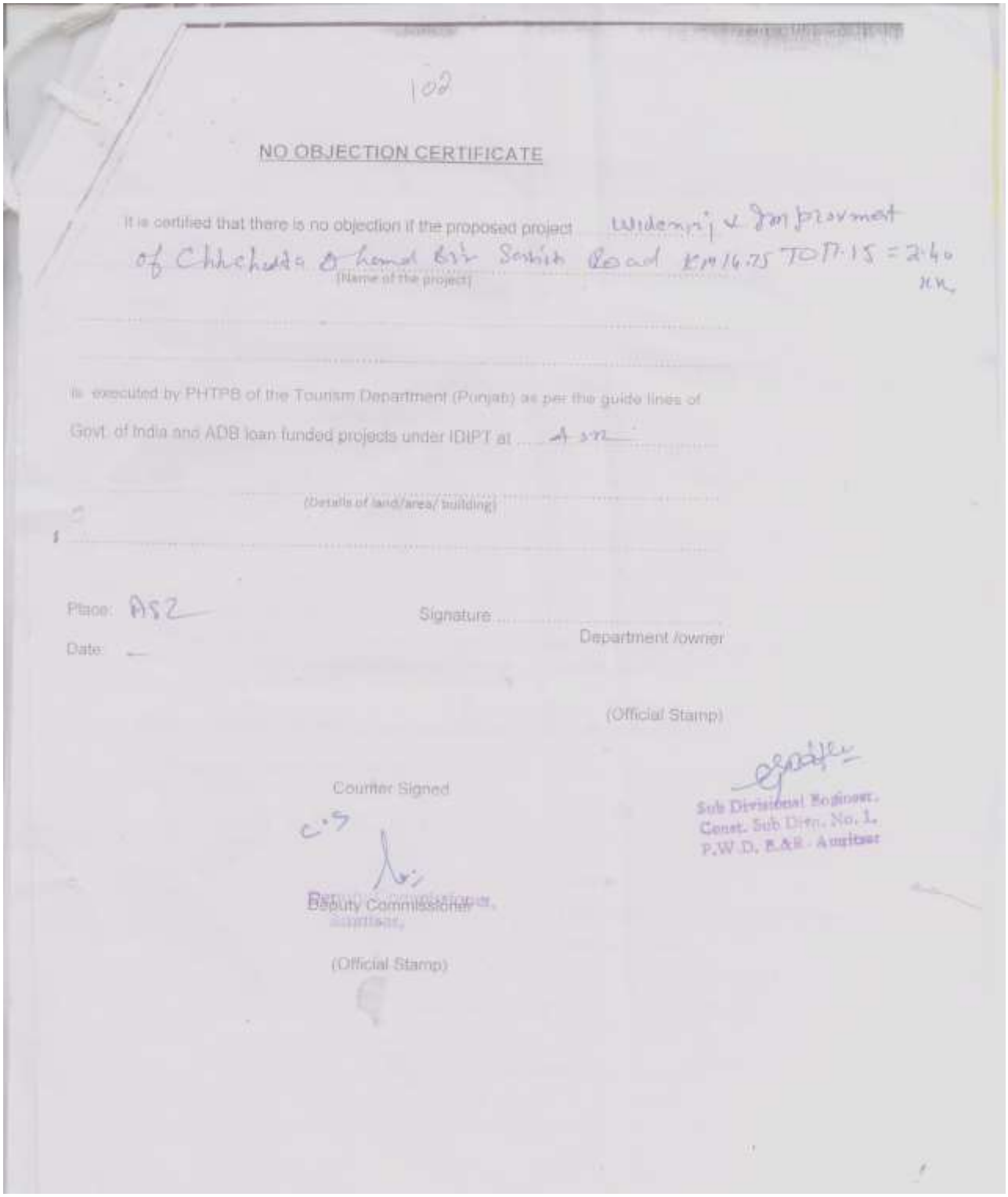
Executive Engineer (C)
Pb. Mandi Board,
Amritsar.

Counter Signed

Deputy Commissioner

(Official Stamp)

No Objection Certificate and Undertaking for Operation and Maintenance of Chheharta Dhand Bir Sahib road



102

NO OBJECTION CERTIFICATE

It is certified that there is no objection if the proposed project Widening & Improvement of Chheharta Dhand Bir Sahib Road Km 16.75 TO 17.15 = 2.40 K.M.

(Name of the project)

is executed by PHTPB of the Tourism Department (Punjab) as per the guide lines of Govt. of India and ADB loan funded projects under IDIPT at Asr

(Details of land/area/ building)

Place: ASR

Date:

Signature

Department /owner

(Official Stamp)

Sub Divisional Engineer,
Const. Sub Divn. No. 1,
P.W.D. B.&R. Amritsar

Courter Signed

C.S

Deputy Commissioner

(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The Widening & Improvement of Chhoharta Dhand Bir Sahib Road K.M. 14.75 To 17.15 = 2.40 K.M (Details of land/area/ building) Where the (Name of the project) Widening & Improvement of Chhoharta Dhand Bir Sahib Road K.M. 14.75 To 17.15 = 2.40 KM project is proposed, for execution by PHTPB of the Tourism Department (Punjab), is under the (Details of the owner) ownership P.W.D of C-I division Asr and is under the possession of P.W.D (B&R) ASR (Details of possessor)

2. There is NO encroachment and NO resettlement/displacement/rehabilitation of people involved in the above Proposed Project area/building/land.

3. The proposed Project is not Partially/Fully part of any other project funded under any other scheme/programme of the State/Central Govt. or any external funding.

4. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by (Name of the department/organization) P.W.D (B&R) ASR

Place: ASR

Date:

Signature

Department/Organisation/Owner

(Official Stamp)

Sub Divisional Engineer, Const. Sub Divn. No. 1, P.W.D. B&R Amritsar

Counter Signed

Deputy Commissioner

(Official Stamp)

No Objection Certificate and Undertaking for Operation and Maintenance of Ramtirath from the other end connecting Jhanjhoti road near Kotla Doom and Saidopura including temple, Phirni, Parking and Allied Tourist Facilities

102

NO OBJECTION CERTIFICATE

It is certifi[illegible] there is no objection if the proposed project Up gradation of last mile connectivity to cultural site to tourist circulation and risk prepared as under A[illegible] scheme.

(Name of the project)

Ram Tirath from the other end connecting Jhanjoti Road Near Kotla Doom and Saidpura including Temple Phirni Parking and allied Tourist Facilities.

is executed by PHTPB of the Tourism Department (Punjab) as per the guide lines of Govt. of India and ADB loan funded projects under IDIPT at Ram Tirath

(Details of land/area/ building)

Place: Sub Divisional Engineer, Provl. [illegible] Sub Division No. 4, PWD B&R [illegible] Amritsar

Date

Signature ....

Department /owner

(Official Stamp)

Counter Signed

Deputy Commissioner, Amritsar.

(Official Stamp)

CERTIFICATE AND UNDERTAKING

It is certified that: -

1. The Amritsar
(Details of land/area/ building)
Where the Upgradation of Last mile connectivity to cultural sites for tourist circulation and Risk Preparedness under ADB Scheme Amritsar from the other area connecting Jhanjoti Road Near Kotlodoom and Gaidpura including Tezpes Portion
(Name of the project)
project is proposed for execution by PHTPB of the Tourism Department (Punjab) is under the ownership of
(Details of the owner)
and is under the possession of
Deptt. of P.W.D. Div 02 Asr.
(Details of possessor)

2. There is NO encroachment and NO resettlement/displacement/rehabilitation of people involved in the above Proposed Project area/building/land.

3. The proposed Project is not Partially/Fully part of any other project funded under any other scheme/programme of the State/Central Govt. or any external funding.

4. The assets created as a result of the execution of above stated project will be taken over for operation and maintenance by
Deptt. of P.W.D. Div 02 Asr.
(Name of the department/organization)

Place: Asr.

Date:

Signature

Department/Organisation/Owner

(Official Stamp)

Sub Divisional Engineer,
Provi. sional Sub Division No. 4,
PWD B&R Amritsar.

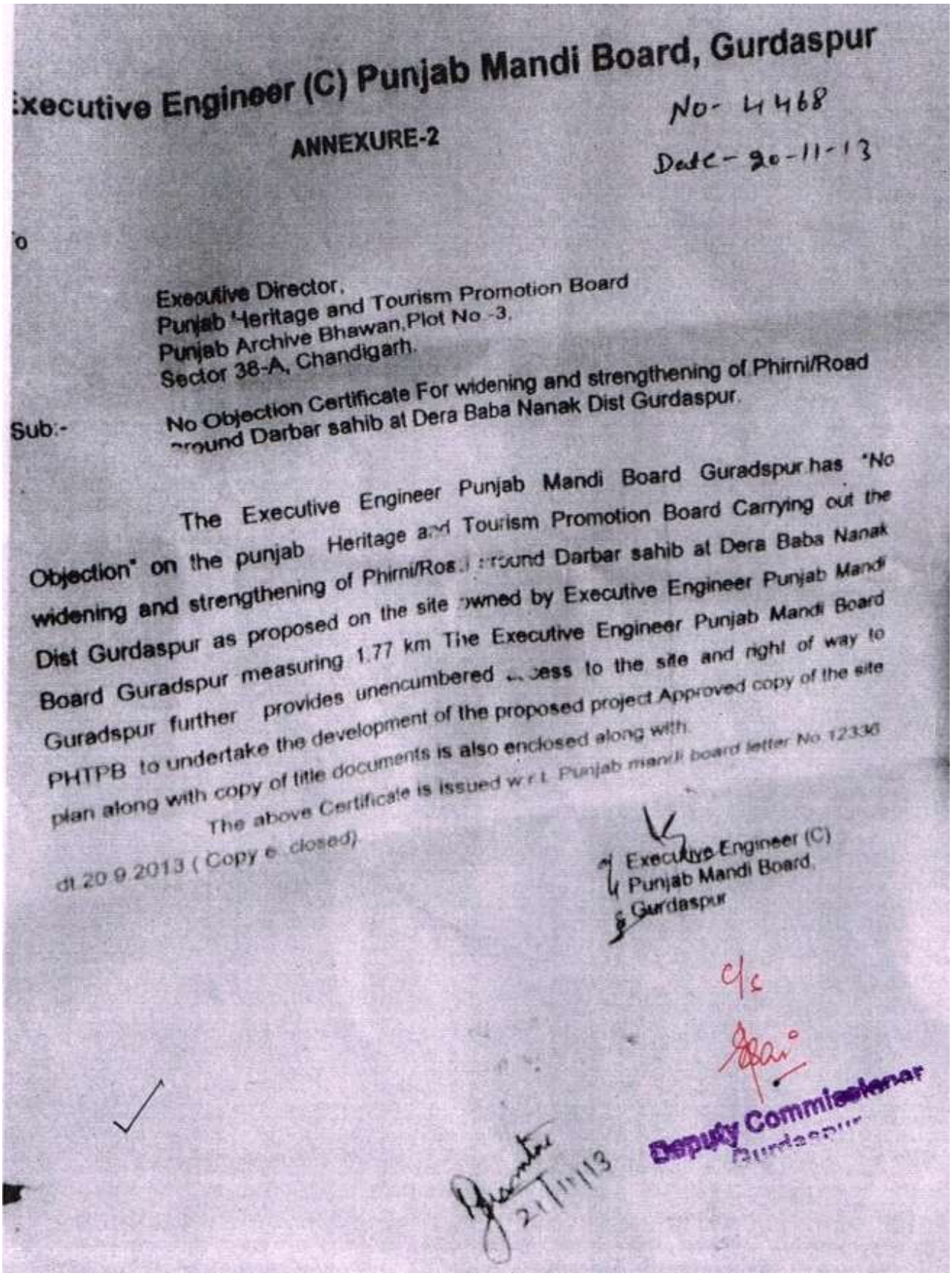
Counter Signed

Deputy Commissioner,

Deputy Commissioner

(Official Stamp)

No Objection Certificate and Undertaking for Operation and Maintenance of Access Road Gurudwara Darbar Sahib to Gurudwara Chola Sahib



Executive Engineer (C) Punjab Mandi Board, Gurdaspur

No- 4468

Date- 20-11-13

ANNEXURE-2

To

Executive Director,
Punjab Heritage and Tourism Promotion Board
Punjab Archive Bhawan,Plot No -3,
Sector 38-A, Chandigarh.

Sub:- No Objection Certificate For widening and strengthening of Phirni/Road around Darbar sahib at Dera Baba Nanak Dist Gurdaspur.

The Executive Engineer Punjab Mandi Board Guradspur has "No Objection" on the punjab Heritage and Tourism Promotion Board Carrying out the widening and strengthening of Phirni/Road around Darbar sahib at Dera Baba Nanak Dist Gurdaspur as proposed on the site owned by Executive Engineer Punjab Mandi Board Guradspur measuring 1.77 km The Executive Engineer Punjab Mandi Board Guradspur further provides unencumbered access to the site and right of way to PHTPB to undertake the development of the proposed project Approved copy of the site plan along with copy of title documents is also enclosed along with.

The above Certificate is issued w.r.t. Punjab mandi board letter No 12336 dt 20 9 2013 (Copy enclosed)

Executive Engineer (C)
Punjab Mandi Board,
Gurdaspur

C/c

Deputy Commissioner
Gurdaspur

21/11/13

Appendix -4

Sample Outline of Spoil Management Plan (SMP)

1.0 Purpose and application:

SMP is to describe how the project will manage the spoil generated and reuse related to design and construction works. This is an integral part of EMP. The objective of SMP is to reuse of spoil from works in accordance with the spoil management hierarchy outlined in this document.

2.0 Objectives of SMP:

The objectives of SMP are:

- To minimize spoil generation where possible
- Maximize beneficial reuse of spoil from construction works in accordance with spoil management hierarchy
- Mange onsite spoil handling to minimize environmental impacts on resident and other receivers
- Minimize any further site contamination of land, water, soil
- Manage the transportation of spoil with consideration of traffic impacts and transport related emissions

3.0 Structure of SMP:

Section 1: Introduction of SMP
Section 2: Legal and other requirements
Section 3: Roles and responsibilities
Section 4: Identification and assessment of spoil aspects and impacts
Section 5: Spoil volumes, characteristics and minimization
Section 6: Spoil reuses opportunities, identification and assessment
Section 7: On site spoil management approach
Section 8: Spoil transportation methodology
Section 9: Monitoring, Reporting, Review, and Improvements

4.0 Aspects and Potential Impacts

The key aspects of potential impacts in relation to SMP are listed in table below

Aspects	Potential Impacts
Air Quality	Potential for high winds generating airborne dust from the stock piles
Sedimentation	Potential for sediment laden site runoff from spoil stockpiles and potential for spillage of spoil from truck on roads
Surface and Groundwater	Contamination of water (surface and ground water)
Noise	Associated with spoil handling and haulage and storage
Traffic	Impacts associated with spoil haulage
Land Use	Potential for spoil to be transported to a receivable site that doesn't have permission for storage/disposal
Design specifications	Limitations on opportunities to minimize spoil generation
Sustainability	Limited sites for storage, reuse opportunities

5.0 Spoil volumes, characteristics and minimization

5.1 Spoil volume calculations: Estimate the volumes of spoils produced from each of the construction sites.

5.2 Characterization of spoil: Based on the type of spoil; characterization is done (sand stone, mud mix materials, reusable materials

5.3 Adopt Spoil Reduce, Reuse Opportunities

- An overview of the assessment methodology to be used is mentioned below.
- Consideration of likely spoil characteristics
- Identification of possible reuse sites
- Screening of possible reuse opportunities

5.4 Identification of possible safe disposal sites for spoil: Those spoils which can't be reuse shall be properly disposed in designated areas, such disposal areas should be identified in project locations. Such disposal areas should be safe from environmental aspects and there should be any legal and resettlement related issues. Such areas need to be identified and prior cliental approval should be obtained to use it as spoil disposal area. The local administration must be consulted and if required permission should be obtained from them.

5.5 Storage and stock piling

5.6 Transportation and haulage route

6.0 Based on the above, the contractor will prepare a SMP as an integral part of EMP and submit it to the PIU/DSC for their review and approval.

Appendix - 5

Sample Traffic Management Plan (TMP)

A. Principles

1. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

- the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- protection of work crews from hazards associated with moving traffic;
- mitigation of the adverse impact on road capacity and delays to the road users;
- maintenance of access to adjoining properties
- Avoid hazards in
- addressing issues that may delay the project.

B. Operating Policies for TMP

2. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
- Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- Train all persons that select, place, and maintain temporary traffic control devices.
- Keep the public well informed.
- Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

C. Analyze the impact due to street closure, if required

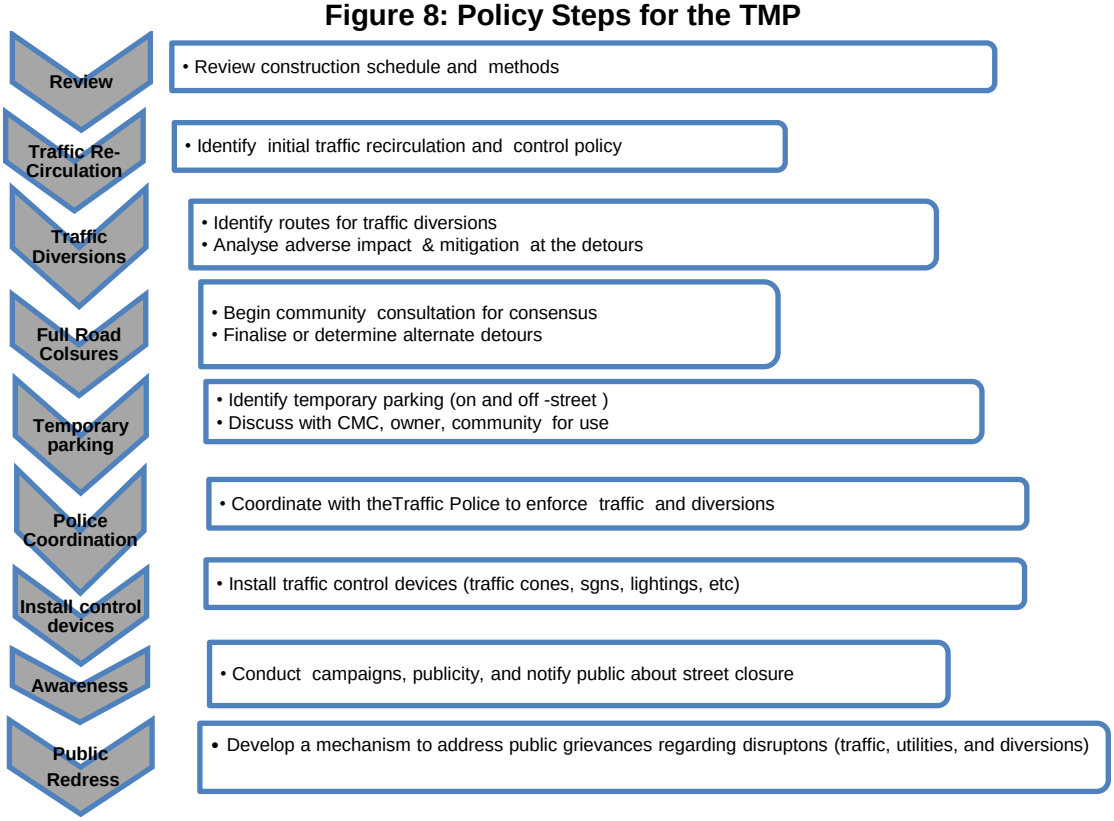
3. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- approval from the PIU, local administration to use the local streets as detours;
- consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- determining if additional traffic control or temporary improvements are needed along the detour route;
- considering how access will be provided to the worksite;
- contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and

- developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

4. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the Detour Street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure 8: Policy Steps for the TMP



D. Public awareness and notifications

5. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

6. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

7. The PIU will also conduct an awareness campaign to educate the public about the following issues:

(i) Traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
(ii) Defensive driving behaviour along the work zones; and
(iii) Reduced speeds enforced at the work zones and traffic diversions.

8. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

9. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

(i) explain why the brochure was prepared, along with a brief description of the project;
(ii) advise the public to expect the unexpected;
(iii) educate the public about the various traffic control devices and safety measures adopted at the work zones;
(iv) educate the public about the safe road user behaviour to emulate at the work zones;
(v) tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
(vi) indicate the office hours of relevant offices.

E. Vehicle Maintenance and Safety

10. A vehicle maintenance and safety program shall be implemented by the construction contractor. The contractor should ensure that all the vehicles are in proper running condition and it comply with roadworthy and meet certification standards of GoN. All vehicles to be used at STWSSP shall be in perfect condition meeting pollution standards of GoN. The vehicle operator requires a pre state of shift checklist. Additional safety precautions will include the requirement for:

- Driver will follow the special code of conduct and road safety rules of Government of Nepal.
- Drivers to ensure that all loads are covered and secured drivers to ensure operation equipment can’t leak materials hauled
- Vehicles will be cleaned and maintained in designed places.

F. Install traffic control devices at the work zones and traffic diversion routes

10. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings

- Channelizing Devices
- Arrow Panels
- Warning Lights

11. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

12. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

13. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

14 In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

15. The PIU and contractor will coordinate with the local administration and traffic police regarding the traffic signs, detour, and any other matters related to traffic. The contractor will prepare the traffic management plan in detail and submit it along with the EMP for the final approval.

Appendix-6

Public Consultations

Public Consultations shall be done during detailed design phase and included in final IEE report

S. No.	Subproject Component	Asset Owner	Date	NoC/ Undertaking
1.	No Objection Certificate and Undertaking for Operation and Maintenance of Approach Road Samadh Jarnail Sardar Shyam SIngh Attari	Department of Punjab Mandi Board, Executive Engineer, Mandi Board, Amritsar.	August 2014	Obtained
2.	No Objection Certificate and Undertaking for Operation and Maintenance of Link road Attari to Pul Kanjri	Director, Cultural Affairs Archaeology & Museums, Punjab, Chandigarh	August 2014	Obtained
3.	No Objection Certificate and Undertaking for Operation and Maintenance of Chheharta Dhand Bir Sahib road	Sub Divisional Engineer, Construction Sub division No. 1, PWD Amritsar.	August 2014	Obtained

Appendix - 7

Sample Grievance Redress Form
(To be available in Local Language and English)

The _____Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback. Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date		**Place of registration**			
Contact Information/Personal Details					
Name		**Gender**	* Male * Female	**Age**	
Home Address					
Place					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below: If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of Official registering grievance)	
Mode of communication: Note/Letter E-mail Verbal/Telephonic	
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	Yes No
Means of Disclosure:	

Appendix - 8

Sample Semi-Annual Environmental Monitoring Report Template

This template must be included as an Appendix in the EIA/IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

INTRODUCTION

- Overall project description and objectives
- Description of sub-projects
- Environmental category of the sub-projects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and sub-project progress and status

No.	Sub-Project Name	Status of Sub-Project				List of Works	Progress of Works
		Design	Pre-Construction	Construction	Operational		
		☐	☐	☐	☐		
		☐	☐	☐	☐		
		☐	☐	☐	☐		

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

No.	Sub-Project Name	Statutory Environmental Requirements	Status of Compliance	Action Required

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

- Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including Environmental Site Inspection Reports.
- There should be Reporting on the following items which can be incorporated in the checklist of routine Environmental Site Inspection Report followed with a summary in the semi-annual Report send to ADB. Visual assessment and review of relevant site documentation during routine site inspection needs to note and record the following:
- What are the dust suppression techniques followed for site and if any dust was noted to escape the site boundaries;
- If muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads;

- adequacy of type of erosion and sediment control measures installed on site, condition of erosion and sediment control measures including if these were intact following heavy rain;
- Are their designated areas for concrete works, and refuelling;
- Are their spill kits on site and if there are site procedure for handling emergencies;
- Is there any chemical stored on site and what is the storage condition?
- Is there any dewatering activities if yes, where is the water being discharged;
- How are the stockpiles being managed;
- How is solid and liquid waste being handled on site;
- Review of the complaint management system;
- Checking if there are any activities being under taken out of working hours and how that is being managed.

Appendix - 9

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with CEMP/EMP

No.	Sub-Project Name	EMP/CEMP Part of Contract Documents (Y/N)	CEMP/EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed & Additional Measures Required

APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Brief description on the approach and methodology used for environmental monitoring of each sub-project

MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (AMBIENT AIR, WATER QUALITY AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 (µg/m3)	SO2 (µg/m3)	NO2 (µg/m3)

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L	TN (mg/L)	TP (mg/L)

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity (µS/cm)	BOD (mg/L)	TSS (mg/L	TN (mg/L)	TP (mg/L)

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

Annexes

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection Report
- Other

Appendix - 10

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION:_____ GROUP: _____

WEATHER CONDITION:
_____

INITIAL SITE CONDITION:
_____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory_____ Incident_____ Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

Intervention Steps:
_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes No

Signature
_____

_____ _____
Name **Position**