FINAL REPORT

COMPREHENSIVE EIA STUDY

For the Project

Gorakhpur Link Expressway

(Through Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh District)

Project Proponent

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Certificate No. NABET/EIA/2124/IA0092,
Valid till November 11/2024

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Chapter 1 Introduction

1.1 Purpose of the Report

The environment clearance of the title work "Proposed Development of Gorakhpur Link Expressway through Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh districts in the state of Uttar Pradesh, M/s Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)" has been obtained from the SEIAA, Uttar Pradesh vide letter no. 569/Praya/SEAC/5305-4603/2018, Date 25.01.2020. (Enclosed as **Annexure-I**).

This Final Comprehensive Environment Impact Assessment Report (CEIA) is in compliance to the General Condition no. 1 of aforementioned EC Letter.

This report also includes four seasons baseline data of all the environmental parameters namely Air, Water, Noise, Soil of the EIA report including for the period September-21 to August-22 covering the general and specific conditions of the EC Letter.

1.2 Introduction

Transportation contributes to the economic, industrial, social and cultural development of any country. Transportation is vital for the social and economic development of any region since every commodity produced whether it is food, clothing, industrial products or medicines need transport at all stages from production to distribution. The adequacy of transportation system of country indicates its economic and social development.

Proposed Greenfield project of Gorakhpur Link Expressway project is generally intended to improve the economic and social welfare of the people. At the same time it may also create adverse impact on the surrounding environment. Highway development and operation should, therefore, be planned with careful consideration of environmental impacts; hence identification and assessment of potential environmental impacts are an integral part of the project cycle. Preparation of Comprehensive Environmental Impact Assessment (EIA) report is essential to avoid and minimize possible impacts during the highway design process, as well as during the implementation phase. The main objectives of the Comprehensive EIA report are as below:

- To document the baseline environmental and social profile of the Project Influence Area based on primary and secondary data.
- To identify and evaluate the impacts on the baseline environmental and social profile of the Project Influence Area due to the proposed project activities during pre-construction, construction and operation phases.
- Incorporation of environmental and social considerations into detailed engineering/technical design of the Project.
- To study various alignment options wherever required, to minimize impacts on environment.
- To prepare an Environmental Management Action Plan (EMP) to minimize or mitigate the adverse impacts of the project.
- Propose and design environmental enhancements to be incorporated in the Project Design.

1.3 Project Background

Government of Uttar Pradesh (GoUP) being committed for the overall development of the areas of Gorakhpur, Ambedkar and Azamgarh region of the State, GoUP, though UPEIDA, has decided to develop "Gorakhpur Link Expressway" connecting Gorakhpur, Ambedkar Nagar and Azamgarh with the State Capital, Lucknow through Purvanchal Expressway. The Uttar Pradesh Expressways Industrial Development Authority (UPEIDA) is an authority set up by the Government of Uttar Pradesh to develop expressway projects in the state under UP Industrial Area Development Act 1976, vide Notification Number 4246/77-4-07-94 Bha/07 TC, Dated December 27, 2007 issued by Industrial Area Development Department - 4, Uttar Pradesh Government. This is an organization with lean and laborious employee base on contract or on deputation basis from State Revenue Department/PWD, among them few are deployed on retainer ship basis or by service provider.

Uttar Pradesh Expressways Industrial Development Authority (UPEIDA), has been entrusted by the Government of Uttar Pradesh for development of Expressways, will act as project implementing organization in Expressway Projects. At pre-construction stage project will be designed by Uttar Pradesh Expressways Industrial Development Authority (UPEIDA), under the assistance of design consultants and later stages such as during construction and operational stage the concessionaire will implement the project under the supervision of UPEIDA.

The UPEIDA is executing the project work under guidance of Chief Executive Officer (CEO) as its head. The Chief Executive Officer is assisted on all technical issues by three managers, which include Manager (Environment) and Manager (R&R) and they are followed by the Executive Engineer, the Assistant Engineer and the Junior Engineer. UPEIDA would play a key role in implementation of the project including the overall control of construction activities and implementation of contracts. The various project engineer, in turn report to the Chief General Manager & Chief Engineer, who is responsible for the co-ordination of the project preparation activities of the various project packages.

1.4 Brief Description of the Project

1.4.1 Nature of the Project

Government of India (GoI) aims to expand the expressways in India to provide better connectivity between major cities and to strengthen industrial growth in the country. Approximately 1450 km of expressways are currently in operation in India. In line with Central Government objectives, the State Government of Uttar Pradesh has initiated many expressway projects in the State.

The aim of the project is to development of an Expressway totaling to a length of 91.352 km, in the State of Uttar Pradesh for connecting eastern region of the State with the State Capital and National Capital Region. The highway will act as connectivity between Gorakhpur and Purvanchal Expressway through the shortest route and in the long-term development plan this will serve as the connecting link between India and Nepal.

1.4.2 Size of the Project

The proposed Greenfield alignments start from underpass near Jaitapur at Gorakhpur bypass and ends at Purvanchal Expressway at 190+600 km with a total length of 91+352 km. The major districts being influenced by the proposed expressways are Gorakhpur, Ambedkar Nagar, Sant Kabir nagar and Azamgarh. The Expressway alignment crosses six rivers namely, Aami River (km 07+303), Kuwano River (km 31+750), Ghaghara River (km 45+980), Choti Sarayu (km 63+717), Tons River (km 80+910) and Majohi River (km 88+505). The project road crosses NH-27 and NH-28 (at km 0+000 and km 60+000 respectively) and SH-72 and SH-5 at Purvanchal Expressway at chainage 190+600.

1.4.3 Location of the Project

The 91.352 km proposed corridor is entirely located in Uttar Pradesh starting from city bypass of Gorakhpur and ending at Purvanchal Expressway near Azamgarh. The proposed corridor has been named after the town of Gorakhpur which is an important town in Uttar Pradesh with significant interactions with Nepal and the rest of the State. Gorakhpur has a population size of nearly 6.73 lakhs as per 2011 census.

The major districts being influenced by the proposed expressway are Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh. The road runs North to South between latitudes of 26°43'0.08"N & 26°12'8.12"N" and Longitudes of 83°17'32.72"E & 82°44'58.94"E. Project starts at km 01+300 of the existing underpass near Jaitpur at Gorakhpur Bypass (NH-27) at 3.7 km west from Gorakhpur-Mau intersection and ends at km 08+300 east from Shahganj-Akbarpur Road (SH-5) at Purvanchal Expressway at km 190+600.

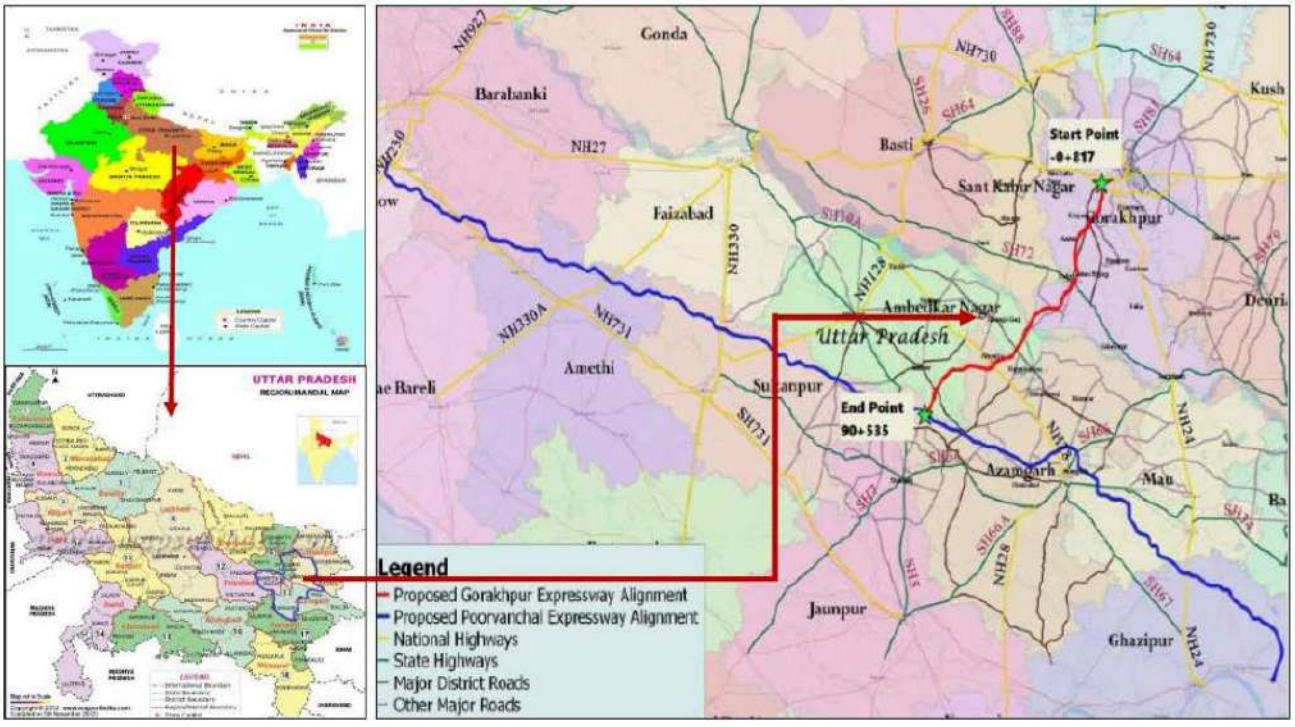


Figure 1: Location Map of Project Road



Figure 2: Google Map of the Project Road

1.5 Approach and Methodology to CEIA

The study methodology for the Comprehensive Environment Impact Assessment (CEIA) employs a simplistic approach and analyses of the environmental issues identified during whole year. The CEIA procedure simultaneously proceeded with the finalized design of the project road which helped to understand the necessary actions required for mitigation measures wherever the impacts were unavoidable due to other constraints. The methodology adopted is depicted as under:

1.5.1. Screening

The Comprehensive Environmental Impact Assessment of the proposed expressway for the project road began with the adoption of an Environmental Screening procedure. The purpose of the screening was to review the proposed project activities and broadly identify the key environmental issues related to the project such as environmentally sensitive receptors along the alignment, change of land use; impacts on surface water bodies, availability of borrow areas, impacts on community facilities, impacts on ecologically sensitive areas, etc. The information gathered during the screening process helped in identifying the areas of concern along the stretch and critical issues to be studied in detail.

1.5.2. Scoping

The scope for the environmental impact assessment has been decided based on past experience of the Consultants for similar projects and project specific Terms of Reference. The outcome of the Initial Environmental Examination/Screening study carried out also helped in finalizing the scope for the CEIA study. The CEIA study being undertaken shall meet the requirements of EIA Notification-2006, Govt. of India. The structure of the CEIA Report is in accordance with the format prescribed under EIA Notification-2006 and as per guidance provided by Ministry of Environment, Forest and Climate Change (MoEF&CC).

1.5.3. Delineation of Project Impact Zone

Corridor of Impact (CoI)

This consists of a strip of land on either side of the center line of the proposed alignment. 500 m width on either side of the center line has been adopted for detailed inventory of environmental features.

Project Influence Area (PIA)

In accordance with MoEF & CC's EIA Guideline Manual for Highways and as per guidelines of EIA Notification-2006, the Project Influence Area has been defined as 15 km on either side (Arial distance) from boundary of road for collection of secondary data, including impacts due to ancillary sites like borrow areas, quarry, material storage, disposal areas, etc.

1.5.4. Reconnaissance Surveys

The design team of the Consultants took the reconnaissance of the project site to assess the likely environmental issues associated with the project. The survey carried out as part of the detailed design data collection also provided valuable information regarding area adjacent to the proposed project corridor. A detailed enumeration of trees along the stretch shall be carried out.

1.5.5. Collection of Secondary Data

Secondary data was collected from various available sources about components of valued Eco-system viz. Climate, Physiography, Soil Type, Ecology, etc.

1.5.6. Generation of Primary data

Environmental monitoring was carried out for determination of ambient air quality, water quality, soil quality and noise level at various locations along the corridor to establish the baseline status of these parameters along the project area.

As part of the baseline environmental profile, a detailed tree inventory along the PRoW was carried out based on their chainage, species, girth and distance from the carriageway. All trees with a girth size more than 30 cm that are falling within the proposed ROW were noted. A survey was conducted in order to quantify the impacts of the project road on various sensitive receptors viz. educational institutes, hospitals, cultural, religious and community properties.

1.5.7. Documentation of Baseline conditions

The data collected through the initial screening exercise, reconnaissance surveys and environmental monitoring were compiled and analyzed and baseline environmental profile of the project impact zone was established.

1.5.8. Identification and Assessment of Potential Impacts

Identification and assessment of impacts on environmental components on account of various proposed activities involved during pre-construction, construction and operation phases of the project based on documented secondary & primary data, previous prototype studies, different prediction models and past experiences.

1.5.9. Analysis of Alternatives

Various project alternatives were considered and adverse impacts of each alternative were studied before selecting the proposed alignment. The assessment of alternatives included that of bypasses, realignments, widening options, etc.

1.5.10. Public Consultations

The consultations were undertaken with residents and shopkeepers to understand the problem faced by locals during construction stage of project and also to peruse view of locals during once after construction activities will be completed. In identification stage the public consultations center on the mapping of the social issues related to the project stretch and thereby understand the concerns and aspirations of the people on the construction of proposed expressway. Public consultations have also facilitated to make a rapport with likely to be affected PAPs in the built up location. The consultations with road users and dwellers assist in finalizing various issued related to widening of the road with service roads, paved shoulder and possible realignments etc.

1.5.11. Preparation of Environmental Management Plan

Environmental Management Plan have been prepared suggesting mitigating measures for various impacts identified during different stages of the project execution. The monitoring programme specifies Environmental monitoring mechanism, frequency, etc. and an institutional framework assigning responsibilities has been proposed for proper implementation. A detailed budget for effective implementation of EMP & Monitoring programme has been finalized as a part of the Project cost.

1.6 Generic Structure of EIA

In line with the EIA notification of MoEF&CC, Dated 14th September, 2006 and subsequent amendments and EIA guidance manual for Highways, the generic structure of EIA report includes the following chapters:

- Introduction
- Project Description

- Analysis of Alternatives
- Description of the Environment
- Anticipated Environmental Impact & Mitigation Measures
- Environmental Monitoring Programme
- Additional Studies
- Project Benefits
- Environmental Management Plan
- Summary & Conclusion
- Disclosure of Consultants engaged

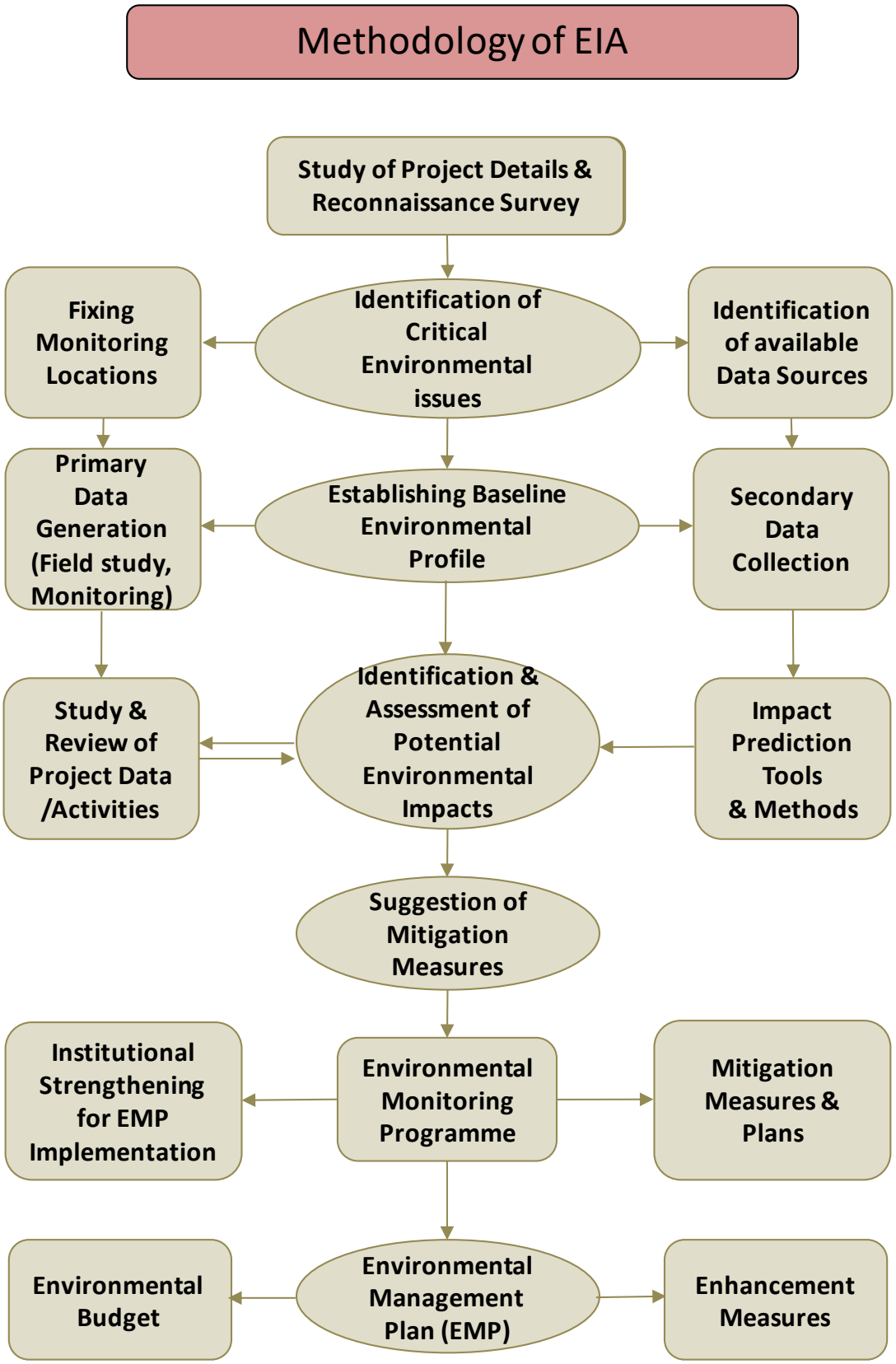


Figure 3: EIA Methodology

1.7 Environmental Regulations Applicable

The Government of India has laid out various policy guidelines, acts and regulations pertaining to sustenance of environment. The Environment (Protection) Act, 1986 provides umbrella legislation for the protection of environment. As per this Act, the responsibility to administer the legislation has been jointly entrusted to the Central Ministry of Environment Forests and Climate Change (MoEF&CC) and the Central Pollution Control Board (CPCB) / State Pollution Control Board (SPCB).

1.7.1 Key Environmental Laws and Regulation, Govt. of India

The brief description of these key environmental laws and regulation is given below:

a. The Environmental Impact Assessment Notification, 2006

As per EIA Notification, 2006 and amendment dated August 22, 2013, the project alignment is green field; hence prior environment clearance was applicable for this project. The user agency had applied for Environment clearance and EC was granted by State Level Environment Impact Assessment Authority, Uttar Pradesh vide letter no. 569/Parya/SEAC/5305-4603/2018, Dated: 25th Jan' 2020.

b. Forest (Conservation) Act, 1980

The Forest (Conservation) Act, 1980 pertains to the cases of diversion of forest area and felling of roadside plantation. Depending on the size of the tract to be cleared, clearances are applied at different levels of government entities. Restrictions and clearance procedures proposed in the Forest (Conservation) Act applies wholly to the natural forest areas, even in case the protected/designated forest area does not have any vegetation cover. The proposed expressway project is devoid of any protected forest land. However, road side plantations on non-protected forest land exist along the proposed alignment and permissions need to be obtained for cutting and transportation of trees along the road.

c. The Water (Prevention & Control of Pollution) Act, 1974

This provides for the prevention and control of water pollution and the maintaining and restoring of the wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

The act resulted in the establishment of the Central and State level Pollution Control Boards whose responsibilities include managing water quality and effluent standards, as well as monitoring water quality, prosecuting offenders and issuing licenses for construction and operation of certain facilities. The user agency has obtained Consent to Establish (CTE) from the State Pollution Control Board of Uttar Pradesh pursuant to the Water (Prevention and Control of Pollution) Act, 1974, since the project activity involves in discharge waste water from labour camps.

d. The Air (Prevention and control of Pollution) Act, 1981

This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence of any 'air pollutant' in the atmosphere, which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentrations as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.
The SPCB is empowered to set air quality standards and monitor and prosecute offenders under The Air Prevention and Control of Pollution) Act, 1981.

e. Noise Pollution (Regulation and Control) Rules, 2000

Considering the dexterous and psychological effects of the noise pollution on human wellbeing, MoEF&CC has drawn up the Noise Pollution (Regulation and Control) rules 2000, according to which a person might make a complaint to the designated authority in the event that the actual noise levels exceed the ambient noise standards by 10dB (A) or more as compared to prescribed standard. The designated authority will take necessary action against the violator in accordance with the provision of these rules or other laws in force.

f. Ancient Monuments and Archaeological Sites and Remains Rules, 1959

The state archaeology comes under the department of language, art & culture. There is a central list of protected monument and state list of protected monuments and other archaeology and remains. There are no listed monuments coming within the purview of the act in the project roads, hence this act is not applicable.

g. Fly Ash Notification, 2007

The MoEF&CC has issued principal Fly ash notification on 14th September 1999 with amendments in 2003, 2009 and 2016 regarding the utilization of flyash/bottom-ash generated from coal/lignite based thermal power plant, to protect the environment, conserve top soil & prevent dumping & disposal of fly ash discharged from coal or lignite based thermal power plants. Further, there is need for restricting the excavation of topsoil & promoting the utilization of fly ash in the manufacture of building materials & in construction activity within the radius of 300 km from coal or lignite based thermal power plants.

No agency, person or organization shall, within a radius of 300 km of thermal power plant undertake construction or approve design for construction of roads or flyover embankment in contravention of the guideline/specification issued by the Indian Road Congress (IRC) as contained in IRC specification SP:58 of 2001. Any deviation from this direction can only be agreed to on technical reasons if the same is approved by Chief Engineer (Design) or Engineer-in-chief of the concerned agency or organization or on production of a certificate of "Pond ash not available" from the thermal power plants (TPPs) located within 300 km of the site of construction. This certificate shall be provided by the TPP within two working days from the date of making request for ash.

Soil required for top or side covers of embankment of roads or flyovers shall be excavated from the embankment site and if it is not possible to do so, only the minimum quantity of soil required for the purpose shall be excavated from soil borrow area. In either case, the topsoil

should be kept or stored separately. Voids created due to soil borrow area shall be filled up with ash with proper compaction and covered with topsoil kept separately as above. This would be done as an integral part of embankment project within the time schedule of the project.

Thermal power plant exists within a distance of 300 km radius from the Project Road; hence the notification is applicable to project activities.

Fly ash is not generated by any project related activities. In compliance to the mandatory MoEF stipulation, fly ash has been procured from NTPC Plant, Tanda (Ambedkar Nagar), UP at a distance of 52.5 km (upto Ch. 62+227) & 92.4 km (upto Ch. 89+847). Total quantity of Fly ash targeted to be consumed in Project is of 4,42,000 m3 of which presently 1,57,990 m3 has been utilized in construction of embankment as per IRC:SP:58-2001.

h. The Explosives Act & Rules, 1884 (revised in 1983)

The purpose of this act is for safe transport, storage and use of explosive materials. Blasting shall be carried out as per The Explosives Rules, 1983. Prior intimation of operational hours of the blasting will be given to the people living near such blasting sites. Blasting will not be undertaken in night hours. This act will be applicable to ensure safe transportation, storage and use of explosive materials at stone quarry sites only.

i. Public Liability Insurance Act, 1991

The purpose of this act is to provide public insurance liability for the purpose or providing immediate relief to the persons affected by accident occurring while handling any hazardous substances. The EIA confirms that appropriate insurance policy will be taken out. EIA identifies hazardous materials associated with the projects and associated accident hazards. Document describes steps to prevent accident hazards and to limit their consequences to the environment. The EIA indicates commitment to provide information, training and equipment to ensure worker safety. EIA describe the mechanisms to notify the concerned authority in the event of a major accident.

This act will applicable to ensure public liability insurance for all workers during construction phase.

The clearances and permissions required under existing environmental legislation to implement the Project are summarized below in Table below.

Table 1: Clearances applicable to the Project Road

Sr. No.	Activity	Statutory Authority	Applicable Statute
1	To protect and improve overall environment	MoEFCC. GoI, DoE, State Govt., CPCB, MPCB	Environment Protection Act, 1986
2	Land Acquisition	DM Offices	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
3	Tree Cutting	District Collector(s)	Uttar Pradesh Land Acquisition Rules
4	Hot Mix Plants, WMM Plants, Crushers and	Uttar Pradesh State Pollution Control	Consent to Establish and Consent to Operate under Air (Prevention and Control

Sr. No.	Activity	Statutory Authority	Applicable Statute
	Batching Plants	Board	of Pollution) Act, 1981
5	Discharges from construction activities	Uttar Pradesh State Pollution Control Board	Consent to Establish and Consent to Operate under Water (Prevention and Control of Pollution) Act, 1974
6	Storage, handling and transport of hazardous materials	Uttar Pradesh State Pollution Control Board	Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
7	Sand mining, quarries and borrow areas	Department of Mines and Geology, Govt. of Uttar Pradesh	Environment (Protection) Act, 1986
8	Ground water extraction	Central/State Ground Water Authority	Environment (Protection) Act, 1986
9	Disposal of Bituminous Wastes	Uttar Pradesh State Pollution Control Board	Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008
10	Segregation, Handling & safe disposal of domestic solid waste	Urban Local Body	Municipal Solid Waste (Management & Handling) Rules, 2000 (MSW Rules)
11	Temporary traffic diversion measures	State Police Department, Uttar Pradesh	MoRTH: 112, IRC: SP- 55
12	Location and Layout of workers Camp, Equipment, storage yards, Quarries	Uttar Pradesh State Pollution Control Board	Environment (Protection) Act, 1986
13	PUC certificate for construction vehicles and machineries	Transport Department, Govt. of Uttar Pradesh	Central Motor and Vehicle Act, 1988
14	Safe recycling of lead acid batteries envisaged to be used at Construction camps.	MoEF&CC	Batteries (Management and Handling) Rules, 2001

Chapter 2 Project Description

This chapter describes the existing features and also discusses the various proposed development programs along the corridor. The project description includes details of project road, proposed traffic, pavement conditions, road inventory, safety and community facilities.

2.1 Details of the Project and Location

2.1.1 Type of the Project Road

The present project covering the stretch of 91+352 km of expressway (Gorakhpur Link Expressway) in the State of Uttar Pradesh encompasses of a greenfield expressway project with four lane paved shoulder expandable to six lane based on expressway geometric design, pavement design, up gradation of intersections, underpasses/ROBs and new bridges and structures wherever necessary along with provision of road safety features.

2.1.2 Size of the Project

The expressway has been proposed as 4 lane dual carriageway road with service road to a maximum of the full length of expressway and at major bridge locations where it has been discontinued. A minimum Right of Way (ROW) of 110 m has been considered for development of expressway. The standard typical cross section has been developed formation width of 30.5m including 5.5m raised median (median including 0.75m edge strip on either side) throughout. The paved width shall be 11.25m (2 lanes width of 7.5m + 3.0m paved shoulder + 0.75m edge strip) on each side of the median. Expressway starts at 1.3 km from underpass near Jaitpur at Gorakhpur bypass and terminating on 8.3 km from Shahganj-Akbarpur road (SH-5) intersection of Purvanchal Expressway.

2.1.3 Location of the Project

The proposed greenfield expressway at Gorakhpur plies between Gorakhpur Bypass (NH-27 Ch. 258+600) starting 1.3 Km away from the underpass near Jaitpur to Ch. 190+855 of Purvanchal Expressway near Salarpur in the State of Uttar Pradesh for a length of 91.352 Km. This Expressway will provide direct high-speed connectivity of eastern U.P. with entire state as well as NCR and will also provide high speed connectivity from Lucknow to Nepal. The road runs North to South between latitudes of 26°43'0.08"N & 26°12'8.12"N" and longitudes of 83°17'32.72"E& 82°44'58.94"E. The expressway, once fully developed would connect Gorakhpur region with the State Capital via the proposed Purvanchal Expressway. The expressway passes the following major districts:

1. Gorakhpur
2. Sant Kabir Nagar
3. Azamgarh
4. Ambedkar Nagar

The alignment crosses 6 major rivers namely Ammi, Kuwano, Ghaghara, Choti Saryu, Majohi River and Tons River with Ghaghara being the largest one with 1450m and Choti Saryu being the shortest one with 70m and does not cross any major protected area, although there is a Military area near the proposed alignment. The expressway has been proposed as 4 lane dual carriageway road with service road to a maximum of the full length of expressway and at major bridge locations where it has been discontinued. A minimum Right of Way (ROW) of 110 m has

been considered for development of expressway. The standard typical cross section has been developed formation width of 30.5m including 5.5m raised median (median including 0.75m edge strip on either side) throughout. The paved width shall be 11.25m (2 lanes width of 7.5m + 3.0m paved shoulder + 0.75m edge strip) on each side of the median. Expressway starts at 1.3 km from underpass near Jaitpur at Gorakhpur bypass and terminating on 8.3km from Shahganj-Akbarpur road (SH-5) intersection of Purvanchal Expressway.

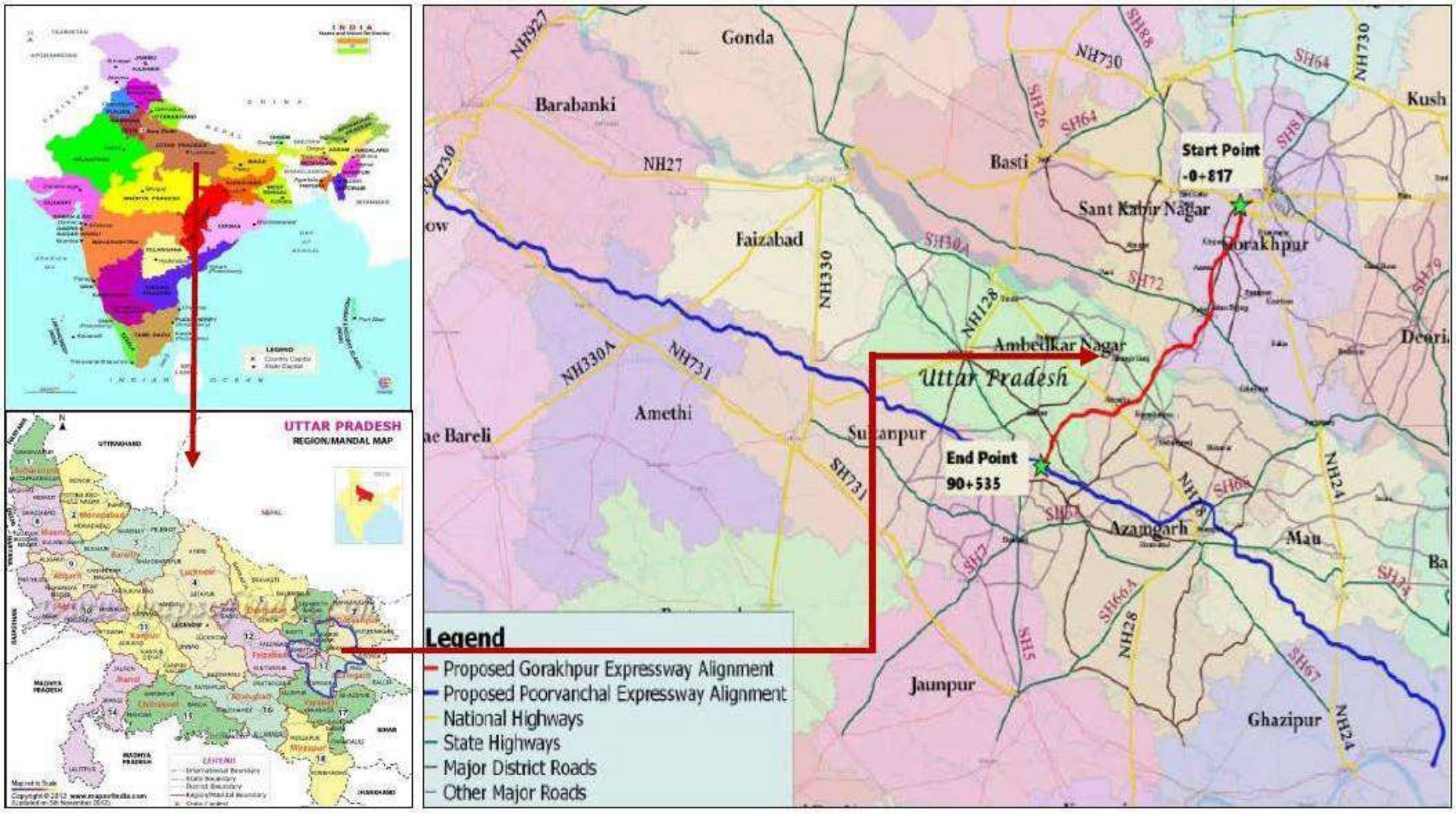


Figure 4: Location of the Project Road

The project road passes through 4 major Districts (Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh) and 65 major revenue villages in Gorakhpur, 6 Villages in Sant Kabir Nagar, 41 major revenue villages in Ambedkar Nagar and 17 major villages in Azamgarh. Total area of land to be purchased for the project is 1098.87 Ha. The project road sections falling in 4 districts are presented in **Table 2** and Location map of the project road is presented in **Figure 4**.

Table 2: Chainage wise list of the districts along the proposed expressway

Sl. No	Existing Chainage (Km)		District
	From	To	
1(a)	0+000	43+210	Gorakhpur
1(b)	43+230	46+600	
2	43+210	43+230	Sant Kabir Nagar
3(a)	46+600	55+400	Ambedkar Nagar
3(b)	72+140	88+000	
4(a)	55+400	72+140	Azamgarh
4(b)	88+000	89+771	

Source: Reconnaissance Survey

2.2 Need for the Project

To keep pace with the forthcoming economic development within the State demands the development of the access-controlled expressway connecting eastern part of the State with the State capital. However, there are other conditions which have led to the demand of the project.

Proposed project corridor starts from 1.3 km away from the underpass near Jaitpur at Gorakhpur and to Ch.190+855 of the proposed Purvanchal Expressway near Salarpur in the State of Uttar Pradesh for a length of 91.352 km. As the Expressway is proposed to be linked through Link Expressways from existing and potential commercial or agricultural hubs and important cities, therefore the entire region will be developed. It provides fast and direct connectivity between Lucknow and four districts of agriculturally important rural hinterland areas of eastern Uttar Pradesh. It will in turn bring agricultural and industrial development in the region and create employment opportunity and occupational transformation from agricultural sector to secondary and then tertiary sector.

The proposed access-controlled expressway corridor traverses through four districts i.e. Gorakhpur, Saint Kabir Nagar, Ambedkar Nagar and Azamgarh of Uttar Pradesh State. 129 villages are likely to be affected by the proposed corridor.

Approximately 1098.87 Ha. of land is proposed to be used for the proposed expressway. This Expressway will lead to economic development of rural areas of Uttar Pradesh by way of their faster linkages to the vast consumer markets. Proposed carriageway is 4-lane expressway (expandable to 6-Lane) with 6-lane structures. The Right of Way of the proposed expressway is 110 meters.

2.3 Project details

2.3.1 Land Acquisition

The total land to be acquired for the project road is 1098.87 Ha. 129 villages are likely to be affected by the project corridor. The total number of structures to be acquired for the project is 687 and the details of the same are given in **Table 3**. The project road runs through fertile agricultural lands and well- developed urban areas and hence the impacts of land acquisition are expected to have significant effect on livelihood and economic activities of the project area.

Table 3: Number of structures to be acquired for the project

Sl. No.	Particulars	Total	Percentage
1	Residential	250	36.39
2	Commercial	15	2.18
3	Religious Properties	9	1.31
4	Govt. /Community Properties	176	25.62
5	Others	237	34.50
Total		**687**	**100**

2.3.2 Diversion of Forest Land

The most part of the project road passes through paddy field and no reserved/protected forest are along the alignment. Hence diversion of forest land shall not be applicable for the project.

2.3.3 Tree Cutting

Thick plantations were observed near the water body and crossing road. The main tree species in the study area are Teak, Imli, Dhaul dhak, Babul, Sagun, Aam, Kathal, Mahua, Neem, Ber, Shisham, Guava, Chilbil, Shisham, Lahtora, Thooth, Jamun, Peepal, Thadd, Lyptus, Khajur, Aam, Arjun, Bael, babul, Bakain, Siris and Poplar etc. While extensive growth of bamboo has also been observed along water courses.

Mango and Guava were the commonly known fruit trees along the alignment. Inventory of trees along the project road was carried out and total number of trees to be felled for the project is found to be 21356. List of trees expected to be removed in a 110 m right of way of the project road are presented in Table 4 and summery of tree inventory is presented in Table 5. The girthwise list of trees along the proposed alignment which is to be felled is given

Table 4: List of trees in the right-of-way of Gorakhpur Link Expressway

Sl. No.	Scientific name	Vernacular/Common name
1.	Eucalyptus sp.	Lyptus
2.	Erythrina stricta	Dhaul dhak
3.	Acacia nilotica	Babul
4.	Tectona grandis	Sagun
5.	Mangifera indica	Aam
6.	Artocarpus heterophyllus	Kathal
7.	Madhuca longifolia	Mahua

8.	Ziziphus mauritiana	Ber
9.	Dalbergia sissoo	Shisham
10.	Psidium guajava	Guava
11.	Azadiracthta indica	Neem
12.	Tectona grandis	Sagun
13.	Dalbergia sissoo	Shisham
14.	Holoptelia integrifolia	Chilbil
15.	Cordia dichotoma	Lahtora
16.	Morus alba	Thooth
17.	Mangifera indica	Aam
18.	Terminalia arjuna	Arjun
19.	Phoenix silvestris	Khajur
20.	Borassus flabellifer	Thadd

Table 5: Summary of the tree inventory along the project road

Sl.No	Location	No. of trees based on girth size			
		Bamboo	Small (20 - 30 cm)	Large (>30 cm)	Total
1	Proposed Express Way	9676	2892	8788	21356

2.3.4 Cutting and Filling off earth

The entire alignment passes through plain terrain. Hence cutting of earth will be mainly for raising of project road. Cutting of earth will be for structures like bridges, culverts and flyover and the quantity of cutting estimated is presented in **Table 6.**

Table 6: Quantity of Earth Cutting

Sl. No.	Description	Unit	Quantity
1	Total volume of earth to be cut	Cum	13094

Filling will be the major activity during the construction of project. The entire alignment runs through plain terrain and quantity of filling material required for the project is given in **Table 7**. Total area to be stripped for the proposed project is1098.87 Ha.

Table 7: Quantity of Earth Filling

Sl. No.	Description	Unit	Quantity
1	Total volume of earth for filling	Cum	18393832

2.4 Project Activities

Summary of details of project activity proposed for the project is presented as **Table 8**

Table 8: Summary of Project Activities

Sl. No	Description		Quantity			
1	Total length (km)		91.352			
2	Proposed RoW for new alignment (m)		110m			
3	Traffic (PCUs)	Location	At Km	At Km	At Km	At Km
		Sections	000+817 to 12+500	12+500 to 27+600	27+600 to 62+000	62+000 to 90+535
		Present Traffic	13599	13891	13908	13249
4	Projected traffic (PCUS)	10 Years	26661	27110	27273	25788
		20 Years	47017	47624	48096	45189
		30 Years	77671	78521	79454	78247
5	Pavement type		Flexible pavement except at Toll Plaza locations. Rigid pavement at Toll Plaza locations.			
6	Number of major bridges		7 nos. as per CA & 1 nos. in COS			
7	Number of minor bridges		13 nos. as per CA & 1 nos. in COS			
8	Number of culverts		383 nos. as per CA & 8 nos. in COS			
9	Number of flyovers		6 nos. as per CA & 1 nos. in COS			
10	Number of vehicular underpasses		16 nos. as per CA & 3 nos. in COS			
11	Number of light vehicular underpasses		48 nos. as per CA & 7 nos. in COS			
12	Number of pedestrian / cattle underpasses		35 nos. as per CA & 14 nos. in COS			
13	Number of Overpass		1 nos. in COS			
14	Toll & Ramp Plaza		2 nos. Toll Plaza and 3 Ramp Plaza in CA and 4 nos. Ramp Plaza in COS.			
15	Number of GAIL pipe line structure		3 nos.			
16	Number of wayside amenities facilities		2 Wayside Amenities facilities			
17	Number of wild animal underpasses		Nil			
18	Number of road over bridge railway crossings		Nil			
19	Length of drain proposed (km)		176.066			
20	Length of retaining wall proposed (km)		2.45 approx.			

2.4.1 Improvements at Sections

2.4.1.1 Proposed Typical Cross Sections

The project highway is proposed to be developed to 4 lane with paved shoulder expandable to 6 lanes with divided carriageway. The horizontal curves shall be designed to have largest practical radius and shall consist of circular portion flanked by spiral transitions at both ends.

Super elevation: Super elevation shall be limited to 7 per cent, if radius of curve is less than desirable minimum radius. It shall be limited to 5 per cent if radius is more than or equal to the desirable minimum. Super elevation provided is not less than the minimum specified cross fall.

Radii of horizontal curve: The desirable minimum radii of horizontal curves are given in Table 9. The radius of horizontal curves for various terrain conditions shall not be less than the desirable minimum values.

Table 9: Desirable Minimum Radii of Horizontal Curves

Design Speed (km/h)	120	100	80
Absolute minimum Radius	670	440	260
Desirable minimum radius	1000	700	400

Transition Curves: Properly designed transition curves shall be provided at both ends of the circular curve. The recommended minimum length of transition curves is given in **Table 10**

Table 10: Minimum length of Transition Curve

Sl. No.	Design Speed(Km/hr)	Minimum Length of Transition Curve (m)
1.	120	100
2.	100	85
3.	80	70

2.4.1.2 Geometric Improvements

The basic aim of the engineering analysis is to identify technically sound, environment friendly and economically feasible road improvement options for the project road. This section aims at formulating improvement proposals encompassing geometric elements viz., horizontal geometry and vertical geometry. Stipulated design speed is given in **Table 11.** The nature of terrain for the proposed expressway was plain and the following design speed given in **Table 11** has been considered:

Table 11: Proposed Design Speed

Sl. No	Nature of Terrain	Cross Slope of Ground	Design Speed
1.	Plain	Less than 10%	120

The horizontal geometric design was carried out using highway software packages complying with the IRC / MORT&H requirements. The strip plan depicting the side on which the proposed widening is being envisaged with proposed service road locations and bypasses have been conceived and is provided. All curves are proposed for improvement to meet the design standards except for the locations given in the Table 12.

Table 12: Summary of Curves

Sl No	Length(m)	Terrain	Radius of curve (m)	Starting Point (m)	End Point(m)
1	564.317	Plain	1200.000	2+260.48	2+824.79
2	357.592	Plain	1200.000	3+464.89	3+822.48
3	730.441	Plain	1200.000	5+724.55	6+455.00
4	212.533	Plain	1350.000	8+074.97	8+287.50
5	214.555	Plain	10000.00	9+630.88	9+845.43
6	761.022	Plain	1200.000	11+426.10	12+187.12
7	2182.689	Plain	30000.000	12+387.12	14+569.81
8	1771.042	Plain	5000.000	15+858.57	17+629.61
9	269.819	Plain	1600.000	19+711.97	20+008.79
10	778.9575	Plain	2000.000	22+080.43	22+859.39
11	1098.946	Plain	1200.000	23+959.50	25+058.45
12	386.867	Plain	2500.000	26+925.65	27+312.52
13	526.549	Plain	2500.000	28+071.77	28+598.32
14	1166.364	Plain	2000.000	28+798.32	29+964.68
15	372.636	Plain	1000.000	30+853.72	31+226.35
16	502.969	Plain	1200.000	33+079.28	33+582.25
17	2330.465	Plain	1600.000	34+050.50	36+380.96
18	1382.084	Plain	3000.000	38+832.92	40+215.00
19	1820.360	Plain	2600.000	42+600.59	44+420.95
20	843.826	Plain	4000.000	44+620.95	45+464.77
21	422.558	Plain	5000.000	46+501.91	46+924.46
22	1056.757	Plain	3000.000	48+231.88	49+288.63
23	1025.892	Plain	3000.000	50+142.65	51+168.54
24	241.953	Plain	25000.000	53+161.38	53+403.34
25	906.629	Plain	1500.000	58+202.51	58+422.39
26	219.880	Plain	25000.000	58+202.51	58+422.39
27	1454.654	Plain	2600.000	60+097.59	61+552.25
28	1449.815	Plain	1500.000	63+019.63	64+469.45
29	221.579	Plain	40000.000	66+476.12	66+697.70
30	714.467	Plain	5000.000	68+311.93	69+026.40
31	1081.954	Plain	1350.000	70+094.34	71+176.30
32	1423.325	Plain	1850.000	71+376.30	72+799.62
33	971.487	Plain	1500.000	75+307.12	76+278.621
34	324.144	Plain	2000.000	79+230.96	79+555.11
35	220.375	Plain	28000.000	81+209.56	81+429.94
36	694.515	Plain	1200.000	83+264.73	83+959.25
37	958.403	Plain	2000.000	84+159.25	85+117.65
38	288.869	Plain	4200.000	87+418.11	87+706.97

2.4.2 Proposed Expressway

A 110.m right of way is proposed at rural and open areas. The proposed ROW along the project stretch is given in **Table 13.**

Table 13: Proposed RoW along the project road

Sl. No.	Design Chainage (km)		Length	Proposed RoW (m)	Remarks
	From	To	Km		
1	0+817	0+000	0.817	360 m	Interchange loop
2	0+000	0+300	0.300	110 to 620 m	Interchange location
3	0+300	4+200	3.900	110 m	
4	4+200	5+080	0.880	110 m to 198 m	Toll plaza
5	5+080	6+620	1.540	110 m	
6	6+620	6+920	0.300	145 m	Nallah training
7	6+920	11+780	4.860	110m	
8	11+780	12+400	0.620	110m + 80m	Interchange loop
9	12+400	25+400	13.000	110 m	
10	25+400	25+ 910	0.510	110 to 345 m	Wayside amenity
11	25+910	27+200	1.290	110m	
12	27+200	27+310	0.110	120m	Nallah training
13	27+310	27+615	0.305	110m	
14	27+615	27+775	0.160	125 m	Nallah training
15	27+775	27+830	0.055	110m	
16	27+830	28+400	0.570	110 m +71 m	Interchange loop
17	28+400	39+865	11.465	110 m	
18	39+865	40+520	0.655	125m	Nallah training
19	40+520	53+740	13.220	110m	
20	53+740	53+800	0.060	120 m	Nallah training
21	61+120	61+660	0.540	110 m + 72 m	Interchange loop
22	61+660	69+450	7.790	110 m	
23	69+450	69+645	0.195	130m	Nallah training
24	69+645	69+985	0.340	110m	
25	69+985	70+255	0.270	130m	Nallah training
26	70+255	74+370	4.115	110 m	
27	74+370	75+185	0.815	110 m to 350 m	Wayside amenity
28	75+185	81+620	6.435	110 m	
29	81+620	82+390	0.770	110 m to 210 m	Toll plaza
30	82+390	89+480	7.090	110 m	
31	89+480	89+770	0.290	110 m to 635 m	Interchange location
32	89+770	90+535	0.765	350 m	Interchange loop

2.4.3 Typical Cross Sections

Based on traffic considerations, geometric standards and existing site condition following typical cross sections have been proposed for different stretches of the project road. Various

types of cross sections adopted for different road stretches are detailed in sub sections. Fifteen types of cross sections were adopted in the design of expressways. Sections wise cross section adopted in the design of expressways are presented in the **Table 14.**

Table 14: Types of Cross Sections Adopted For Different Road Stretches

Sl.No	From (Km)	To (km)	Type of Cross Sections
1	-0.817	-0.060	K1
2	-0.060	0.100	G1
3	0.100	0.175	C1
4	0.175	4.650	C
5	4.650	5.000	B
6	5.000	6.010	E
7	6.010	6.470	B
8	6.470	6.960	F
9	6.960	7.230	G
10	7.230	7.380	Major Bridge
11	7.380	8.000	G
12	8.000	8.100	D
13	8.100	9.220	F
14	9.220	9.860	E
15	9.860	10.230	F
16	10.230	11.900	I
17	11.900	12.330	A
18	12.330	12.520	A1
19	12.520	12.730	I1
20	12.730	12.800	I
21	12.800	13.920	A
22	13.920	14.290	I
23	14.290	14.480	F
24	14.480	15.270	D
25	15.270	16.130	F
26	16.130	17.290	E
27	17.290	17.640	A
28	17.640	18.050	D
29	18.050	19.020	F
30	19.020	19.790	D
31	19.790	20.590	E
32	20.590	21.950	F
33	21.950	22.700	D
34	22.700	23.550	F
35	23.550	24.000	D
36	24.000	25.370	F
37	25.370	25.910	D
38	25.910	26.780	F
39	26.780	27.400	I
40	27.400	27.800	I1
41	27.800	28.100	I
42	28.100	29.070	A
43	29.070	29.460	I
44	29.460	29.840	F
45	29.840	30.220	D
46	30.220	30.800	F
47	30.800	31.090	D

48	31.090	31.620	G
49	31.620	31.870	Major Bridge
50	31.870	31.950	G

The sections adopted in the design of expressway are A, B, C, D, E, F, G, H, I, A1, C1, G1, I1, J1 and K1. General arrangement drawing for the cross sections followed in the design of expressway are presented in Figure 2.2 to 2.16

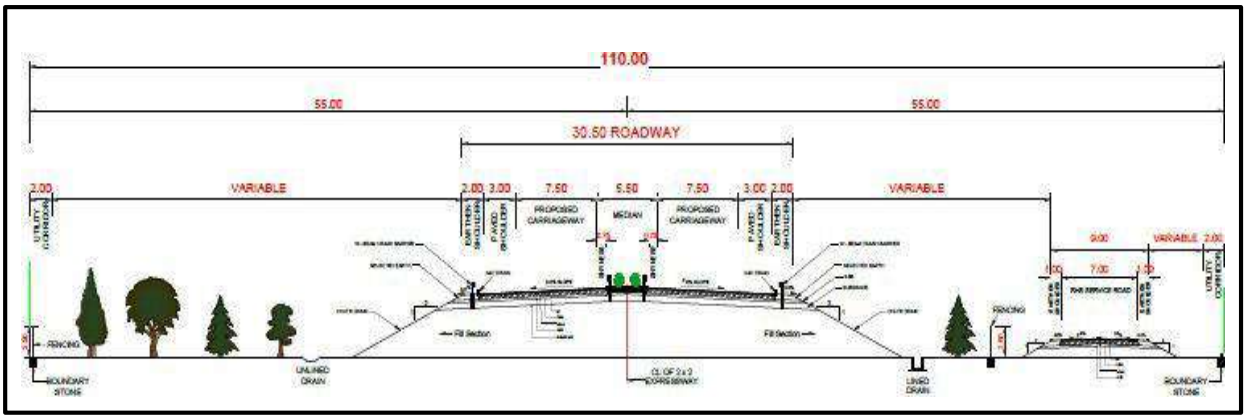


Figure 5: TCS-A: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 7.0 m wide Service Road on LHS

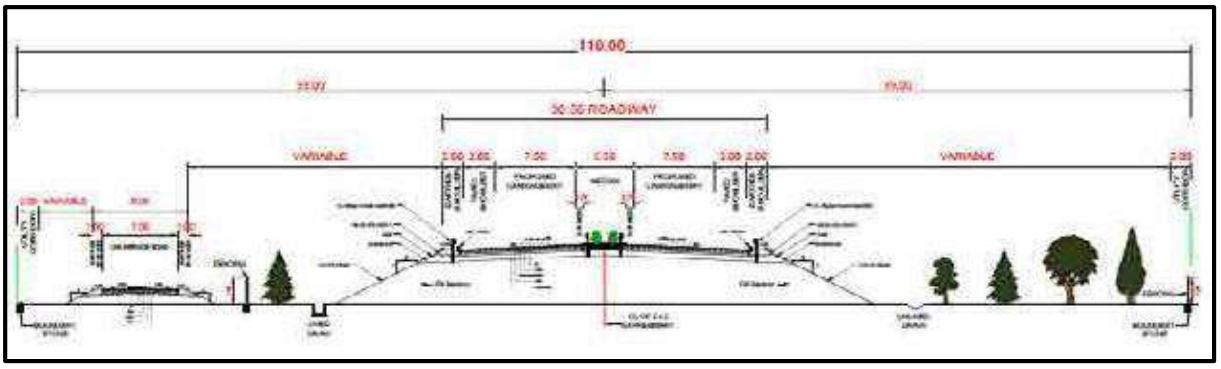


Figure 6: TCS-B: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 7.0 m wide Service Road on LHS.

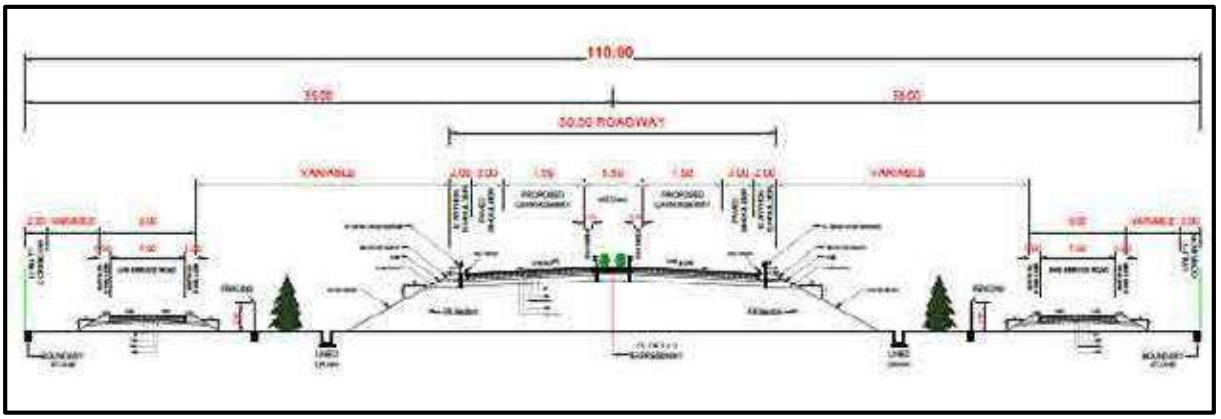


Figure 7: TCS-C: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 7.0 m wide Service Road on Both sides

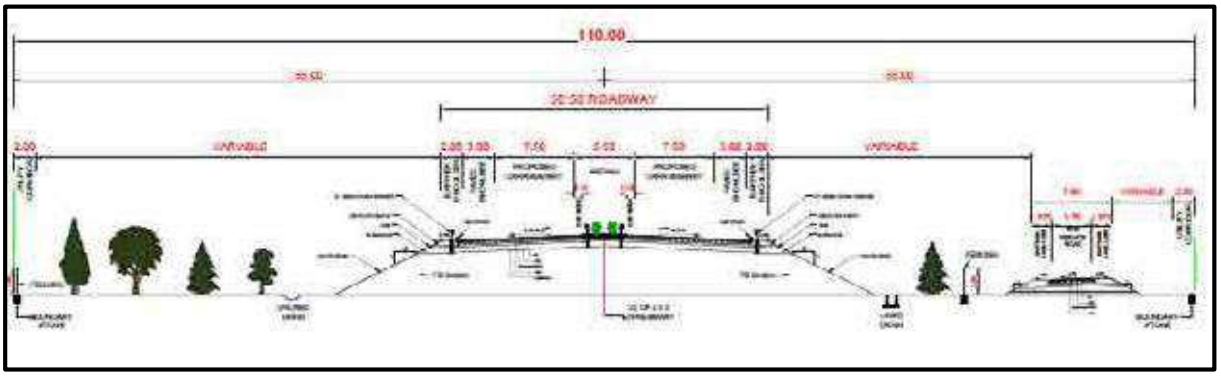


Figure 8: TCS-D: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 3.75 m wide Service Road on RHS

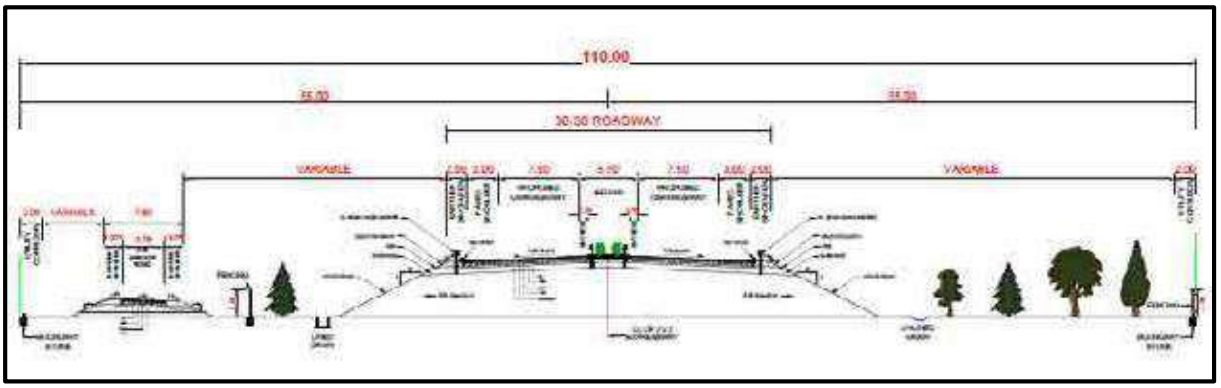


Figure 9: TCS-E: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 3.75 m wide Service Road on LHS

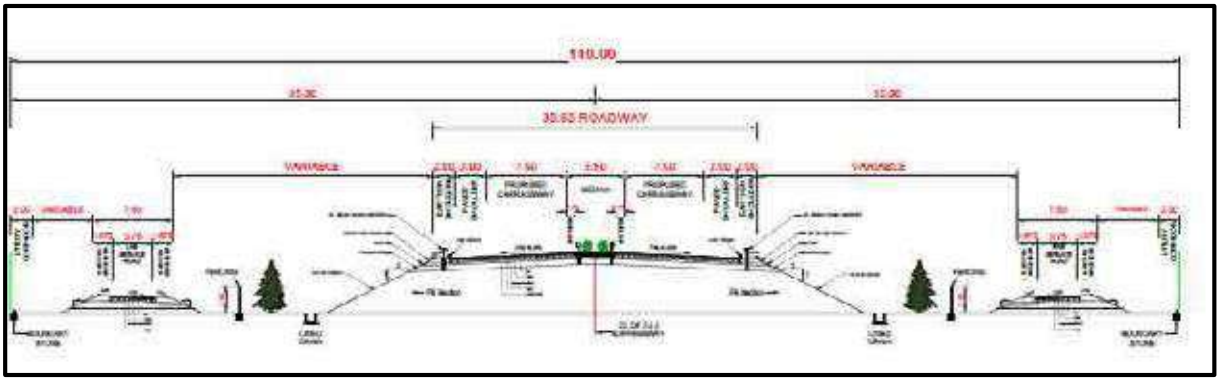


Figure 10: TCS-F: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 3.75 m wide Service Road on Both sides

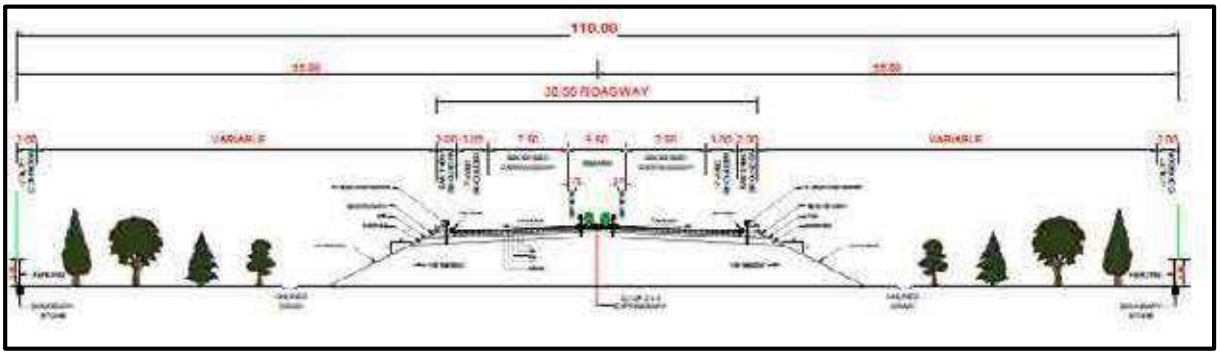


Figure 11: TCS-G: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling without service road

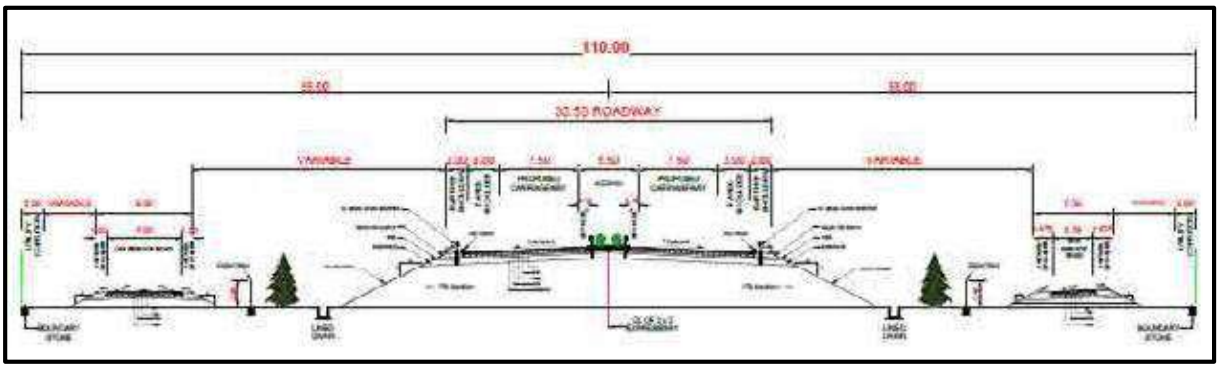


Figure 12: TCS-H: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 7.0m wide service road on LHS and 3.75m wide service road on RHS

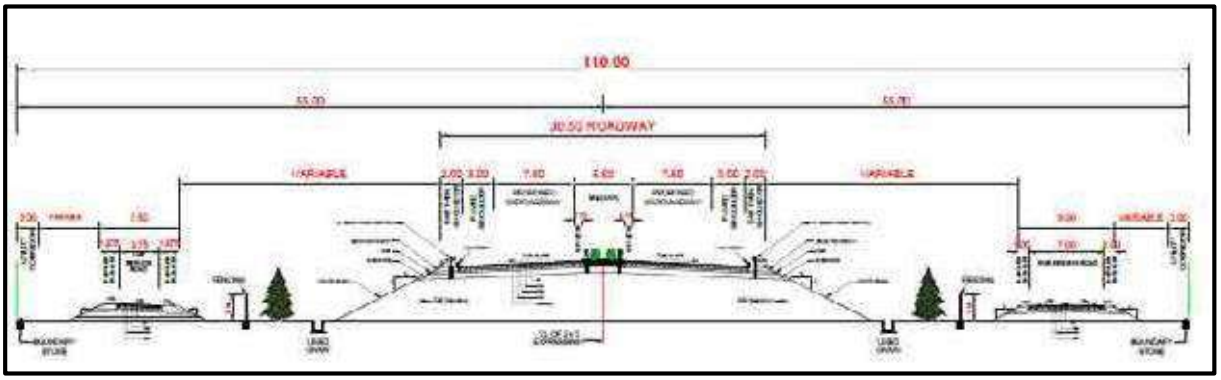


Figure 13: TCS-I: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Terrain Section in Filling with 7.0m wide service road on LHS and 3.75m wide service road on LHS

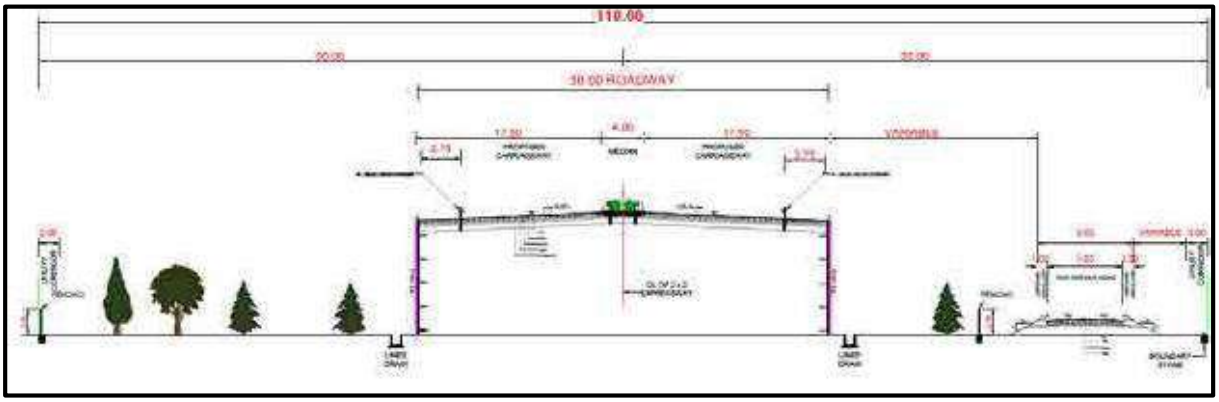


Figure 14: TCS-A1: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Section with RE Wall (Approaches to Flyover) and 7.0 wide service road on RHS

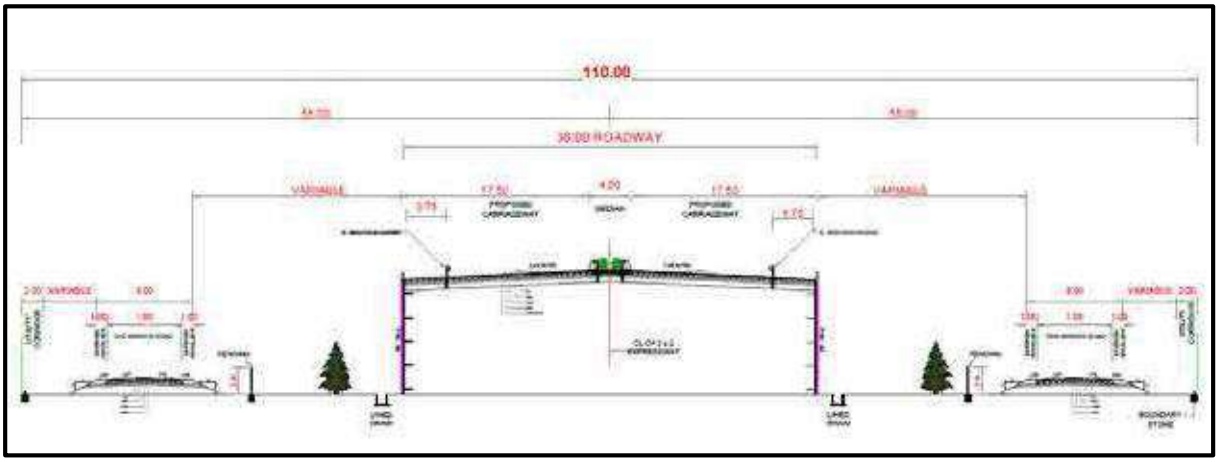


Figure 15: TCS-C1: Typical Cross Section for 4 Lane(2x2) Expressway in Plain or Rolling Section with RE Wall (Approaches to Flyover) and 7.0 wide service road on both sides

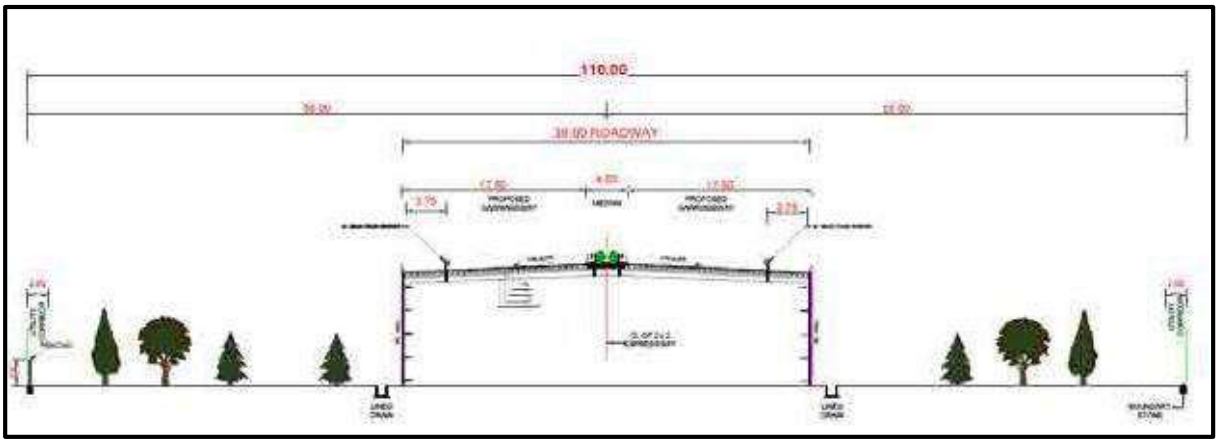


Figure 16: TCS-G1: Typical Cross Section for 4 Lane (2x2) Expressway in Plain or Rolling Section with RE Wall (Approaches to Flyovers)

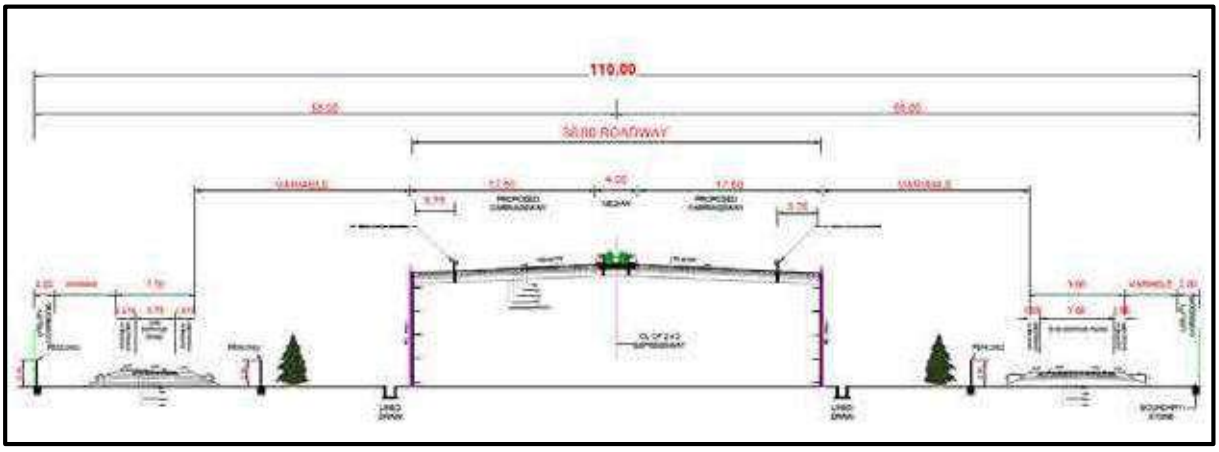


Figure 17: TCS-G1: Typical Cross Section for 4 Lane (2x2) Expressway in Plain or Rolling Section with RE Wall (Approaches to Flyovers)

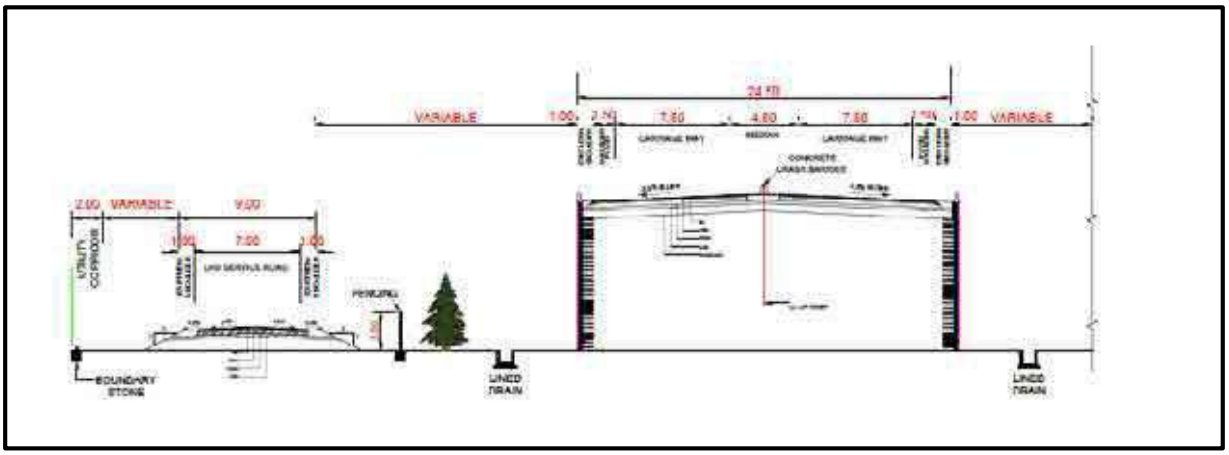


Figure 18: TCS-J1: Typical Cross Section of Two way ramp with RE Wall, with 3.75 m Service Road on RHS

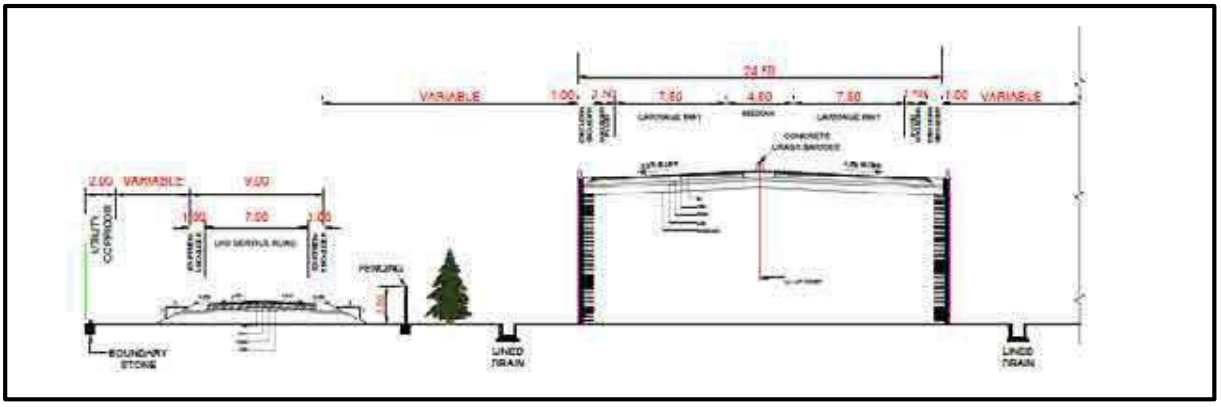


Figure 19: TCS-J1: Typical Cross Section of Two way ramp with RE Wall, with 3.75 m Service Road on RHS

2.4.4 Provision of Service roads

The project road is proposed as an access-controlled facility, service road of painted width 7.5m is provided at major locations and service road of 3.75m painted width has been provided in remaining length on either side of expressway, except at locations of major bridges where it has been discontinued. A design speed of 40 km/hr is considered for service roads.

2.4.5 Proposed Junctions/Interchanges

The proposed Gorakhpur Link Expressway crosses National Highways, State Highways, Major District Roads and Village Roads. Major roads coming along the alignment are NH-27, Gorakhpur bypass road, SH-72, Rajesultanpur-Tanda road and Deurpur road (NH-28). Minor road crossing the alignment are Baradad-Jaitpur road, MDR 163E, Gorakhpur-Malhanpar Road, Sikriganj-Gorakhpur Road, Sikriganj-Belghat road, Atraualia-Ahiraula road and Jalalpur-Ramgrah road. Locations where alignment crosses major roads like NH, SH and MDR, interchanges shall be provided for the smooth flow of traffic. Vehicular Underpass (VUP)/Light Vehicular Underpass (LVUP) are proposed at minor road crossings for the crossing of traffic.

Table 15: List of Interchanges

SI	Chainage (km)	Type of Interchange
1	0+000	Trumpet Interchange
2	9+200	Half Diamond Interchange
3	12+250	Trumpet Interchange
4	27+600	Double Trumpet Interchange
5	36+729	Diamond Interchange
6	53+803	Diamond Interchange
7	62+220	Double Trumpet Interchange
8	73+306	Diamond Interchange
9	89+850	Trumpet Interchange

Overpass: One Overpass is proposed at Ch. 28+245

2.4.6 Vehicular Underpasses/Light Vehicular Underpass

Vehicular Underpass (VUP)/ Light Vehicular Underpass (LVUP) are proposed at minor road crossings for the crossing of traffic along the paved proposed project road. There are total 74 Vehicular Underpasses along the alignment. The location details of vehicular underpass/light vehicular underpass are presented in **Table 16** below.

Table 16: List of Vehicular Underpasses/Light Vehicular Underpass

SI No	Chainage (km)	Type of Structure
1	0+100	VUP
2	1+650	LVUP
3	2+900	LVUP
4	3+230	LVUP
5	6+490	LVUP
6	8+792	LVUP
7	9+218	VUP

SI No	Chainage (km)	Type of Structure
8	9+850	LVUP
9	10+210	VUP
10	11+417	LVUP
11	12+255	VUP
12	12+825	VUP
13	14+290	LVUP
14	15+220	VUP
15	15+520	LVUP
16	17+290	LVUP
17	18+488	LVUP
18	19+790	LVUP
19	21+180	LVUP
20	21+360	LVUP
21	21+750	LVUP
22	22+715	VUP
23	24+625	LVUP
24	25+370	LVUP
25	25+575	VUP
26	26+780	LVUP
27	28+243	VUP
28	29+475	LVUP
29	30+440	LVUP
30	31+960	LVUP
31	32+555	LVUP
32	33+810	LVUP
33	34+795	LVUP
34	35+735	LVUP
35	36+845	VUP
36	37+530	LVUP
37	38+140	LVUP
38	40+315	VUP & LVUP shifted to 38+140
39	42+155	LVUP
40	44+125	LVUP
41	46+855	VUP
42	47+800	LVUP
43	48+590	LVUP
44	49+870	LVUP
45	50+645	LVUP
46	53+000	LVUP
47	53+790	VUP
48	55+095	LVUP
49	55+860	LVUP
50	56+853	LVUP
51	57+570	LVUP
52	60+140	LVUP
53	61+525	VUP
54	61+980	VUP
55	62+220 Ramp	LVUP
56	63+080	LVUP
57	64+510	VUP
58	65+870	LVUP

SI No	Chainage (km)	Type of Structure
59	68+525	LVUP
60	69+465	LVUP
61	71+475	LVUP
62	73+306	VUP
63	74+418	LVUP
64	74+800	VUP
65	75+250	LVUP
66	76+565	LVUP
67	79+770	LVUP
68	81+620	LVUP
69	82+805	VUP
70	83+575	LVUP
71	84+920	LVUP
72	87+140	LVUP
73	88+088	LVUP
74	88+943	LVUP

2.4.7 Pedestrian/Cattle Underpasses

Total of 49 Pedestrian Under Passes (PUP) are proposed so that the capacity, speed and safety of travel along the project road are not affected along the project stretch. The location details of pedestrian/cattle underpasses are presented in **Table 17.**

Table 17: List of Pedestrian Underpasses

SI No	Chainage (km)	Type of Structure
1	0+500	PUP
2	3+655	PUP
3	4+045	PUP
4	5+340	PUP
5	8+245	PUP
6	10+932	PUP
7	11+825	PUP
8	13+350	PUP
9	13+920	PUP
10	16+120	PUP
11	16+680	PUP
12	19+300	PUP
13	20+620	PUP
14	24+010	PUP
15	31+090	PUP
16	33+530	PUP
17	36+480	PUP
18	39+388	PUP
19	40+915	PUP
20	41+735	PUP
21	Interchange Ramp 0+000	PUP

SI No	Chainage (km)	Type of Structure
22	Interchange Ramp 0+000	PUP
23	Interchange Ramp 12+520	PUP
24	Interchange Ramp 27+600	PUP
25	Interchange Ramp 27+600	PUP
26	48+055	PUP
27	50+306	PUP
28	51+357	PUP
29	54+305	PUP
30	58+725	PUP
31	59+030	PUP
32	60+945	PUP
33	62+200 Interchange Ramp	PUP
34	65+115	PUP
35	67+255	PUP
36	67+820	PUP
37	69+110	PUP
38	72+375	PUP
39	73+870	PUP
40	76+240	PUP
41	77+740	PUP
42	79+250	PUP
43	80+295	PUP
44	82+335	PUP
45	84+550	PUP
46	85+515	PUP
47	86+125	PUP
48	86+365	PUP
49	89+850 Interchange Ramp	PUP

2.4.8 Water Bodies and Bridges

The proposed Gorakhpur Link Expressway alignment crosses six rivers namely, Aami River (7+300), Kuwano River (31+700), Ghaghara River (46+000), Choti Sarayu (63+700), Tons River (80+900) and Majohi River (88+500). Among the six, the Ghaghara River is a major river originating from the lake Manasasarovar having a large catchment area. The catchment areas of Ghaghara River are Amdekarnagar, Azamgarh, Barabanki, Basti, Ballia, Bahraich, Deoria, Faizabad, Gonda, Gorakhpur, Sant Kabir Nagar, Kheri, Lakhimpur, Sitapur of Uttar Pradesh.

Aami River originates from Sohanara and serves as a lifeline for the people of Siddarth Nagar, Sant Kabir Nagar, Basti and Gorakhpur district in Eastern Uttar Pradesh. It travels a distance of about 126 km and drains into Rapti in Gorakhpur district of Uttar Pradesh.

The 08 nos. major bridges were proposed across four major rivers, nallah and canal. The locations of major bridges are Aami River, Kuwano River, Ghaghara Basin, Ghaghara River, Nallah at 44+925 & Ch. 51+725, Canal at 78+605 and Tons River. Minor bridges were provided at 14 nos. locations where the alignment crosses nallah, canal and river. The locations of major and minor bridges are given in Table 18.

Table 18: Location list of Major / Minor bridges

Sl No	Chainage (km)	Type of Structure	Location
1	2+058	Minor Bridge	Nallah
2	6+235	Minor Bridge	Nallah
3	7+303	Major Bridge	Aami river
4	13+570	Minor Bridge	Nallah
5	17+477	Minor Bridge	Nallah
6	31+750	Major Bridge	Kuwano river
7	34+143	Minor Bridge	Nallah
8	42+540	Major Bridge	Ghaghara Basin
9	43+790	Minor Bridge	Nallah
10	44+295	Minor Bridge	Nallah
11	44+925	Major Bridge	Ghaghara river, Nallah
12	45+980	Major Bridge	Ghaghara river
13	51+725	Major Bridge	Nallah
14	55+750	Minor Bridge	Nallah
15	63+717	Minor Bridge	Choti Sarayu
16	66+355	Minor Bridge	Canal + Road
17	70+245	Minor Bridge	Nallah
18	71+940	Minor Bridge	Nallah
19	76+015	Minor Bridge	Nallah
20	78+605	Major Bridge	Canal
21	80+910	Major Bridge	Tons river
22	88+505	Minor Bridge	Majohi river

2.4.8 Wayside Amenities & Toll Plaza

The service areas shall be planned and provided as way side amenities for users of the expressways to enable them to stop, take rest and refresh themselves so as to ease their fatigue. These areas also cover facilities for providing fuel for vehicles and emergency requirements without having to exit from the expressway. The service areas shall provide for vehicles, for passenger/drivers and for operation and maintenance. The wayside amenities shall be provided on either side of the expressway at every 50 km with approach from both directions. For these ancillary activities the proponent will take specific permission from concerning department like State Pollution Control Board etc.

Toll plaza shall have a separate office building so as to provide comfortable office space for manager, cashier and other staff. There shall be separate rooms for TV monitors, meetings, toilets and for sale of passes, smart cards, on board units and public interaction. Toll plaza locations are provided with system for checking and preventing overloading of vehicles at toll plaza. Vehicles found to be overloaded shall not be allowed to use the expressway. Tunnels are proposed for the movement of personnel between toll office and toll booths of lanes. Tunnels should have sufficient dimension to accommodate the required wiring/cable system and for convenient movement of personnel. Toilet blocks shall be provided on both sides in between wayside amenities which comprises facilities such as toilet, drinking water, telephone booth & sufficient off/ on street parking space. The summary of wayside amenities is given in **Table 19.**

Table 19: Summary of user block amenities

Sl. No.	Type of Amenity	Nos. of Facilities	Locations
1	Way side amenities	2	At Ch. 25+650 and Ch. 74+740
2	Toilet Block	2	At Ch. 48+910 and Ch. 49+060
3	Toll Plaza	2	
4	Ramp Plaza	7 (3 in CA & 4 in COS)	
5	Toll booth	2	At Ch. 12+520 and Ch. 27+600

2.4.10 Road Furniture, Traffic Signs, Road Marking, & Landscaping

Road furniture such as kilometer posts, hectometer stones, guard posts and ROW pillars etc. on the project road provided as per IRC Codes shall meet requirements of MORTH specifications. Road boundary stones shall be provided at the boundary on both sides of the Right of Way. These shall be spaced at 100m intervals. The boundary stones shall be of cement concrete as per type design given in IRC: 25-1996. The kilometer stones shall be provided at each kilometer on both sides of the expressway. The design and specification of kilometer stones shall conform to IRC: 8-1980. Hectometer (100 m) stones shall be provided at every 100 m distance on both sides of the expressway. The design and specification of 100 m stones shall confirm to 200 m stones of IRC:26.

Road delineators are roadway indicators, hazard markers and object markers. Hazard markers and object markers as per IRC: 79-1981 are given where there are objects close to the road which may prove hazardous. All physical objects above the Finished Road Level (FRL) that are falling within 6m from the carriageway edge line shall be illuminated with Object Hazard Markers (OHM). The objects shall include utility poles, traffic sign posts or parapet walls or concrete barrier of bridges, culverts, RE walls, start of underpass or flyovers. Road studs are also proposed and are placed on the carriageway along the road centerline and edge lines at suitable intervals.

Landscaping and tree plantation shall be as per Section 14 of IRC: SP: 99-2013. Trees on the roadside shall be sufficiently away from the roadway so that they are not a hazard to road traffic or restrict the visibility and sight distance. In the sections of highway, where the median

width is more than 3.0m, shrubs shall be planted and maintained to cutoff headlight glare from the traffic in the opposite direction. The height of the shrubs shall be maintained at 1.5 m to cut off the effect of traffic lights coming from the opposite direction. Spacing of avenue trees will depend on the type and growth characteristics of trees, requirement of maintenance, and penetration of distant views. A range of 10-15m would meet the requirement for most varieties.

2.4.11 Street Lighting

Street lighting are proposed in urban & semi urban sections of the project road, on grade separators, at major intersections and at rest areas and other wayside amenities as per IRC: SP: 84, 2009.

Lighting is provided at the following locations:

- Continuous Expressway lighting is to be warranted on those sections where three or more successive interchanges are located at a spacing of 2.5 Km or less, and adjacent areas outside the right of way are urban in character.
- Continuous Expressway lighting shall be provided where for a length of 3Km or more, the expressway passes near an urban area in which one or more of the following conditions exist:
    - a) Local traffic operates on a complete street grid having some form of street lighting, parts of which are visible from the expressway.
    - b) The expressway passes near a series of developments such as residential, commercial, industrial and civic areas, school, colleges, parks, terminals, etc., which includes roads, streets, and parking areas, yards, etc. that are lighted
- In rural areas each location must be individually evaluated as to its need for evaluation.
- Complete interchange lighting shall be provided on all the interchanges.
- Lighting shall be provided inside the underpasses. The lighting of bridges and overpasses should be of the same level and uniformity as the roadway.
- Lighting shall be provided at Toll Plaza Locations, Tunnels and Wayside Amenities.

Unless stated otherwise elsewhere as per IRC: SP: 84, 2009, the minimum level of illumination on the stretches of the project road including toll plazas, truck lay-byes, interchanges etc. shall be 40 Lux. Vertical and horizontal clearances for electrical installations shall conform to IRC:32. All the fixtures, wires/cables, lights shall conform to relevant BIS specifications as a minimum.

2.4.12 Utility Corridor, Railings and Crash Barriers

2.0 m wide strip of land at the extreme edge of ROW has been proposed as utility corridor for accommodating utilities as per SP 99-2013. Utility corridor was proposed between Ch. (-) 0+ 817 to 90+535 km on both sides of the alignment.

Crash barriers above the earthen shoulder and median are proposed throughout the alignment except at locations of approaches to grade separated structures where concrete crash barriers are provided.

2.4.13 Protection Work and Drainage

Effective drainage is an essential requirement for soundness of road pavement structure. The drainage study was carried out as per IRC: SP: 42 (Guidelines on Road Drainage).

Protection works are envisaged in high embankment locations in the form of turfing/pitching, gabion walls and retaining wall. For embankments of height up to three mts., a normal slope of one vertical to two horizontals has been proposed and erosion is controlled by shoulder side kerb with gutter and evacuation flumes. For the same, with height more than 3 m, side protection with Geo-cell with trufing, chute drains and band drains have been envisaged.

For the project stretch with service roads, longitudinal drains are provided on each side of the highway - in between main carriageway and service road. The surface run-off within the ROW and from the adjacent lands gets collected in these drains and is discharged into the natural nalas, rivulets and rivers through cross-drainage structures like culverts and bridges. For the project stretches without service roads, longitudinal earthen drains on both sides have been proposed.

The drains along the service roads are rectangular shaped lined drains (refer typical cross sections) with flume in the openings at the paved shoulder edge kerb to direct run-off from the main carriageway to the drains or side ditches. Run-off from embankments up to 3000 mm high flows down the slopes to the longitudinal drains. For embankments higher than 3000 mm, kerbs with gutter have been provided at the edge of the paved shoulders with openings in the kerb plus flume at regular spacing to direct surface run-off to the drains or ditches.

2.4.14 Pavement Design

The design of new pavement sections shall take into account all relevant factors for assuring reliable performance and shall also satisfy the specified minimum performance requirements. The design is based on the soil investigations carried out along the proposed alignment and soil conditions of the borrow areas and availability of materials in the nearby vicinity. The results as per Traffic survey carried out at various locations in the field have also been considered in pavement design. The pavement design is in accordance with IRC: 37: Guidelines for the Design of Flexible Pavements further the proposed modifications as per IRC: 37 have also been considered in the pavement design. The design methodology for the new pavement will typically include:

- An assessment of the strength of the sub-grade foundation.

- Determination of the vehicle damaging factors for the commercial vehicles,
- Computation of the number of cumulative commercial vehicles as per the traffic growth rate along the project road.
- Assessment of the distribution of commercial traffic over the (lane factor).
- Conversion of the cumulative number of commercial vehicles to the cumulative number of standard axles (design traffic) for the design year
- Traffic growth rates as per field traffic survey analysis
- The effective CBR based on IRC: 37 recommendation
- Iterations as per IITP have been done to arrive at optimum design
- The adequacy of the GSB layer thickness has been checked as per IRC: 37 recommendation

After computing the design traffic loading and the strength of the sub-grade, the required thickness for the new required thickness for the new pavement is determined from the IITPave.

Chapter 3 Analysis of Alternatives

3.1 Introduction

The selection of alignment for expressway will be finalized after analysing various alternatives of alignment between the terminal stations. General criteria for fixing the alignment for an expressway are as follows:

- Alignment between the two terminal stations should be short and as far as possible be straight, but due to practical considerations deviations are needed.
- Alignment should be easy to construct and maintain. It should be easy for the operation of vehicles
- It should be safe both from the construction and operating point of view
- The alignment should be economical and it can be considered so only when the initial cost, maintenance cost and operating cost are minimum.
- The location of major structures is to be finalized while fixing the alignment. It includes interchanges, ROBs, Major bridges. The space requirement of interchanges to be kept into consideration.
- The location of spurs for connecting the important towns to be decided while fixing the alignment options.
- The alignment should follow the unused/ barren land/ green field to the extent possible to reduce the cost of land.

The obligatory points through which the alignment cannot pass and were considered during alignment finalization are as below-

- Proposed alignment is fixed in such a way that it is at a minimum distance from built up areas.
- At most care is taken while the alignment near wildlife sanctuaries and national parks. While the alignment is fixed in such a way it is away from sanctuaries as per MoEF&CC guidelines, it is not possible to completely avoid the reserve forest areas. However, every effort is made to reduce the acquisition of forest area.
- Alignment is fixed duly considering the importance of retaining the existing water bodies.
- The components for increase in cost of the project are presence of the major bridges and ROB's. Care is taken to reduce the number and length of these structures duly considering the expressway alignment design standards.

Based on the above considerations, different options were analysed during the project report preparation and are discussed as below. Three major alternate alignment were identified by the consultant based on the prefeasibility report shared by the client. The options were numbered as Option 1, Option 2 and Option 3.

All alignment options studied considering the starting location of the expressway as 1.3 km from underpass near Jaitpur at Gorakhpur Bypass (NH-27) and 3.7 km west from Gorakhpur-Mau intersection and ends at 8.3 km East from Shahganj- Akbarpur road (SH-5) at Purvanchal Expressway at chainage 190.600 km. After evaluating the path of GAIL pipe line and Ghaghara River crossings, three options were worked out for Gorakhpur Expressway. **Figure 20** shows the alignment options proposed with minor deviation in the approved option 1 alignment of prefeasibility report (hereby refer as prefeasibility alignment).



Figure 20: Initial Proposed Alignments

3.1.1 Alignment Option 1

The alignment option 1 is proposed with minor deviation in prefeasibility alignment and are given in **Figure 21 to 24**.

Total alignment length for option 1 is 89.539 km and crosses the GAIL pipe lines at three locations. For alignment Option 1, no major deviation from the approved prefeasibility alignment is given between 0+000 to 11+300. At chainages between 53+900 to 55+500, 59+900 to 63+200, 70+400 to 71+300 and 83+400 to 86+200 there is minor deviations towards right and between chainages 58+500 to 59+900, 68+900 to 69+900 and 74+000 to 75+000 minor deviations are provided towards left of the prefeasibility alignment.

Between chainage 11+300 km to 22+100 km, the alignment deviates towards right from the prefeasibility alignment and it crosses GAIL pipeline at 2 locations where as the prefeasibility proposal runs over the GAIL pipeline. From chainage 22+100 km to 35+400 km, Option 1 deviates minimum from the prefeasibility proposal. Between 35+400 km to 48+900 km the initial alignment deviates towards left to avoid cutting of approach roads of new bridge constructions across Ghaghara River and to keep safe distance from GAIL pipeline. Construction of bridge between this chainage comes along the curve of the river. Option 1 follows the prefeasibility proposal between chainages 48+900 to 53+900, 55+500 to 58+500, 63+200 to 68+900, 69+900 to 70+400, 71+300 to 74+000, 75+000 to 83+400 and 86+200 to 88+530 with minor deviations. Features of the alignment option is given in **Table 20.**

Table 20: Features of Alignment Option 1

From	To	Remarks
0+000	11+300	Follows the initial alignment option with minor deviations
11+300	22+100	Deviates to right. Crosses GAIL pipe line at two locations.
22+100	35+400	Follows the initial alignment option with minor deviations
		Deviates to Left. Avoids the cutting approach roads of new
48+900	53+900	Follows the initial alignment option with minor deviations
53+900	55+500	Deviates to right
55+500	58+500	Follows the initial alignment option with minor deviations
58+500	59+900	Minor deviation to left
59+900	63+200	Minor deviation to right
63+200	68+900	Follows the initial alignment option with minor deviations
68+900	69+900	Curve deviates to left
69+900	70+400	Follows the initial alignment option
70+400	71+300	Curve deviates to right
71+300	74+000	Follows the initial alignment option
74+000	75+000	Curve deviates to left
75+000	83+400	Follows the initial alignment option with minor deviations
83+400	86+200	Minor deviation to right.
86+200	88+530	Follows the initial alignment option with minor deviations



Figure 21: From 0+000to CH 24+000



Figure 22: From 24+000 to CH 55+000

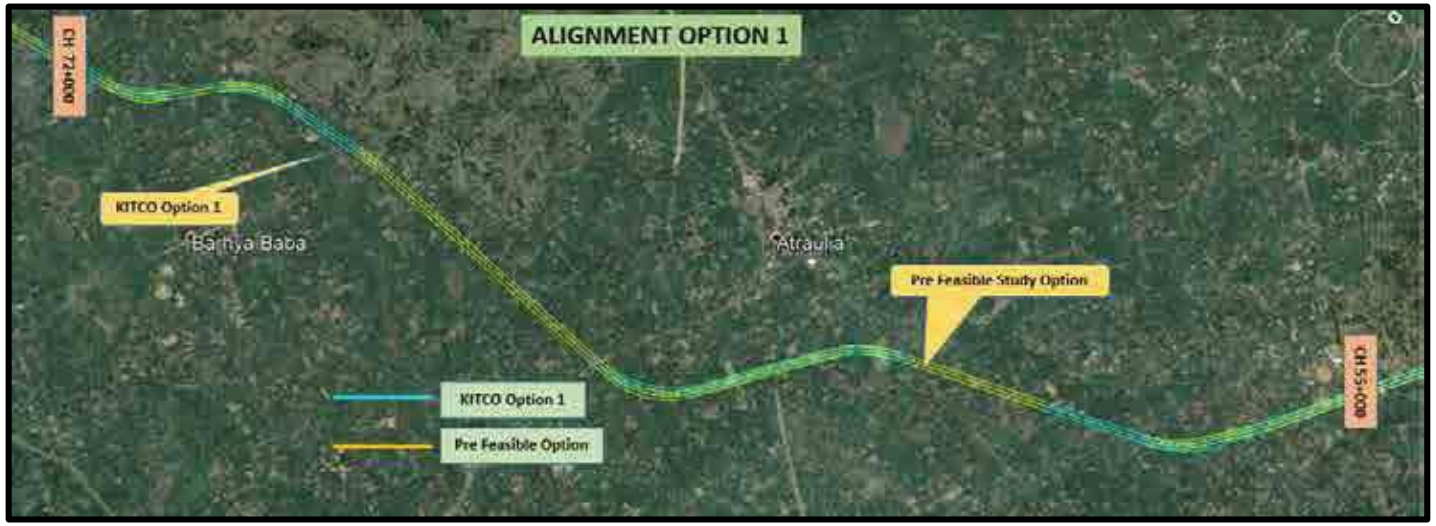


Figure 23: From CH 55+000 to 72+000

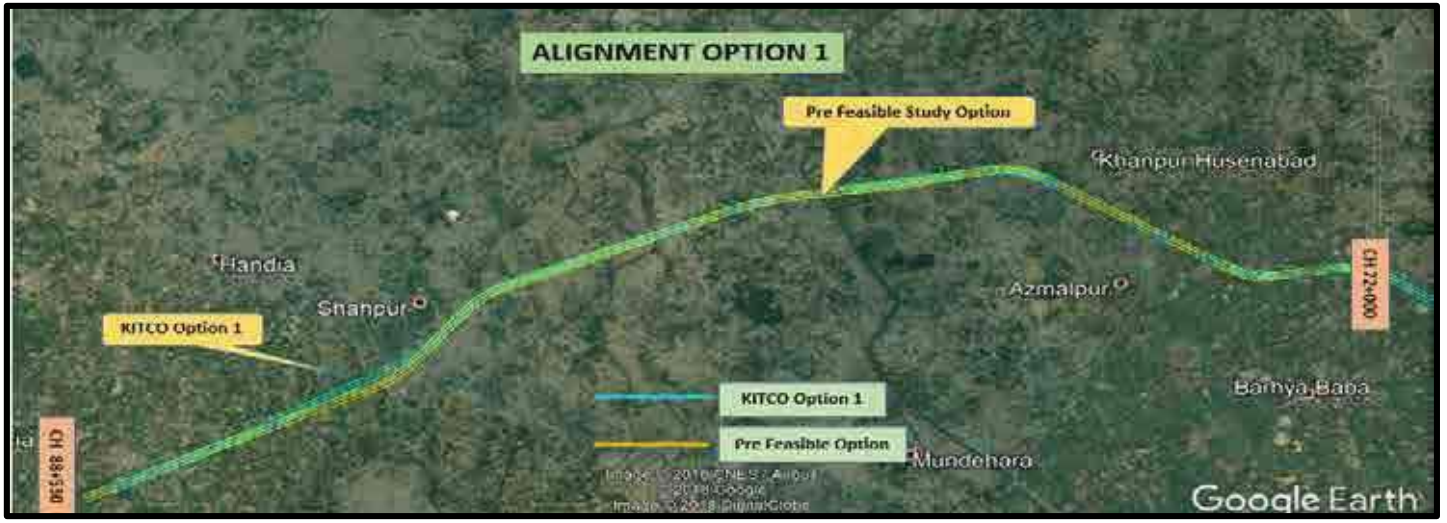


Figure 24: From CH 72+000 to 88+530

3.1.2 Alignment Option 2

Option 2 is proposed with a total length of 87.875 km and single GAIL pipe line crossing. The alignment features of Option 2 were discussed in **Table 21** and **Figure 25 to Figure 28** shows the comparison of option 2 with prefeasibility alignment.

In proposed option 2, the chainage from 0+000 to 11+000 follows prefeasibility alignment with minor deviation. Between chainage 11+000 to 24+700 it deviates to left to avoid the GAIL pipeline crossings. From 35+400 to 50+900 the alignment deviates to left to avoid cutting of approach road for the new bridge construction across Ghaghara River. This option avoids curve in bridge portion. Between chainages 59+100 to 62+800, 69+100 to 70+300, 73+600 to 76+800, 76+800 to 82+800 and 82+800 to 87+300 the alignment deviates towards right. Chainages were alignment deviates to the left are between 52+900 to 54+900, 68+000 to 69+100, 70+300 to 73+600 from the prefeasibility proposal. And from 87+300 to the end of alignment there is minor deviation compared to the prefeasibility alignment.

Table 21: Features of Alignment Option 2

From	To	Remarks
0+000	11+200	Follows the initial alignment option with minor deviations
11+200	24+700	Deviates to Left avoiding crossing with GAIL pipe line
22+100	35+400	Follows the initial alignment option with minor deviations
35+400	50+900	Deviates to Left. Avoids the cutting approach roads of new bridge constructing across Ghaghara River. Avoids curve in bridge portion.
50+900	52+900	Follows the initial alignment option with minor deviations
52+900	54+900	Deviates to left
54+900	59+100	Follows the initial alignment option with minor deviations
59+100	62+800	Alignment deviates to right
62+800	68+000	Follows the initial alignment option with minor deviations
68+000	69+100	Curve deviates to left
69+100	70+300	Minor deviates to right
70+300	73+400	Follows the initial alignment option with minor deviations towards left
73+400	73+600	Alignment Deviates to left
73+600	76+800	Follows the initial alignment option with minor deviations towards right
76+800	82+800	Minor deviation to right
82+800	87+300	Alignment deviates to right
87+300	87+875	Follows the initial alignment option with minor deviations



Figure 25: From CH 0+000 to 25+000



Figure 26: From CH 25+000 to 50+000



Figure 27: From CH 50+000 to 75+00



Figure 28: From CH 75+000 to 87+875

3.1.3 Alignment Option 3

Alignment length for option 3 is 87.435 km and crosses the GAIL pipeline at one location. Features of alignment option 3 are discussed in **Table 22** given below and **Figure 29** to **Figure 32** compare the Option 3 alignment with prefeasibility alignment.

Chainage 11+300 to 23+700 deviates to left to avoid crossing of GAIL pipeline and between chainage 23+700 to 25+300 the alignment follows the initial alignment of prefeasibility report. At chainages 25+300 to 31+500 and 32+100 to 34+300 the alignment deviates towards right and at chainage 34+300 to 47+900, the alignment proposed deviates towards left to avoid cutting approach roads near Ghaghara and to avoid curves in bridge portion. Along 49+200 to 52+800, 57+800 to 58+400,67+600 to 68+600 the proposed alignment deviates towards left. The chainage 52+800 to 54+200, 58+400 to 62+100 and 69+300 to 70+200 the alignment deviates to right on comparing with prefeasibility alignment. At chainage 72+900 to 73+800 the alignment deviates to left and at chainage 73+800 to 86+600, the alignment deviation is towards right of the prefeasibility alignment.

Table 22: Features of Alignment Option 3

From	To	Remarks
0+000	11+300	Follows the initial alignment option with minor deviations
11+300	23+700	Deviates to Left avoiding crossing with GAIL pipe line
23+700	25+300	Follows the initial alignment option with minor deviations
25+300	31+500	Deviates to right
31+500	32+100	Follows the initial alignment
32+100	34+300	Deviates to right
34+300	47+900	Deviates to Left. Avoids the cutting approach roads of new bridge constructing across Ghaghara River. Avoids curve in bridge portion
47+900	49+200	Follows the initial alignment
49+200	52+800	Deviates to left
52+800	54+200	Alignment deviates to right
54+200	57+800	Follows the initial alignment
57+800	58+400	Alignment deviates to left
58+400	62+100	Alignment deviates to right
62+100	67+600	Follows the initial alignment
67+600	68+600	Alignment deviates to left
68+600	69+300	Follows the initial alignment
69+300	70+200	Alignment deviates to right
70+200	72+900	Follows the initial alignment
72+900	73+800	Alignment deviates to left
73+800	76+000	Alignment deviates to right
76+00	86+600	Alignment deviates to right
86+600	87+435	Follows the initial alignment option with minor deviations



Figure 29: From CH 0+000 to 25+000



Figure 30: From CH 25+000 to 47+000



Figure 31: From CH 47+000 to 70+000

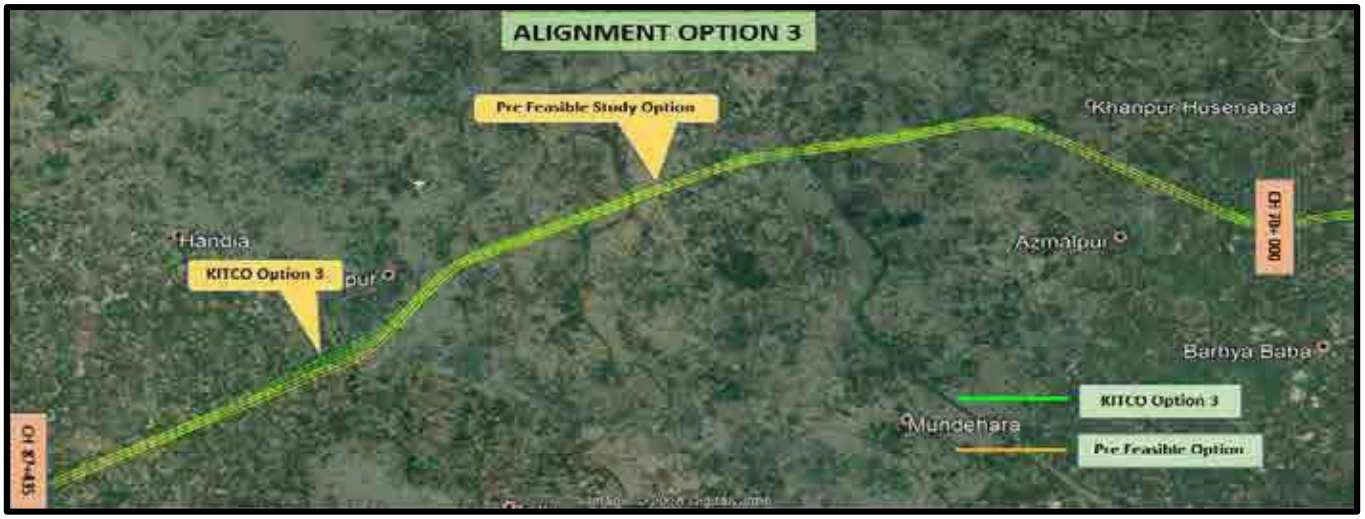


Figure 32: From CH 70+000 to 87+435

3.1.4 Alignment Deviations Analysis

The proposed three alignment options, starts and ends at common points. **Figure 33** and **Figure 34** compare the sections of alignment with major deviations. Chainages between 10+700 to 24+800 and 33+200 to 52+200 are the locations were the alignments deviations from the prefeasibility alignment. On comparison of the options, it can be seen that the options 2 & 3 deviates to the left between 10+700 to 24+800 while the option 1 deviates to the right of the prefeasibility alignment. All the three options avoid cutting of approach roads of new bridge construction across Ghaghara River by deviating from the prefeasibility alignment. For alignment Option 3 bridge lies at the curved portion of the river while options 2 and 3 avoids the curve in bridge portions.



Figure 33: Major Alignment Deviations 1- From CH 11+200 to CH 35+400

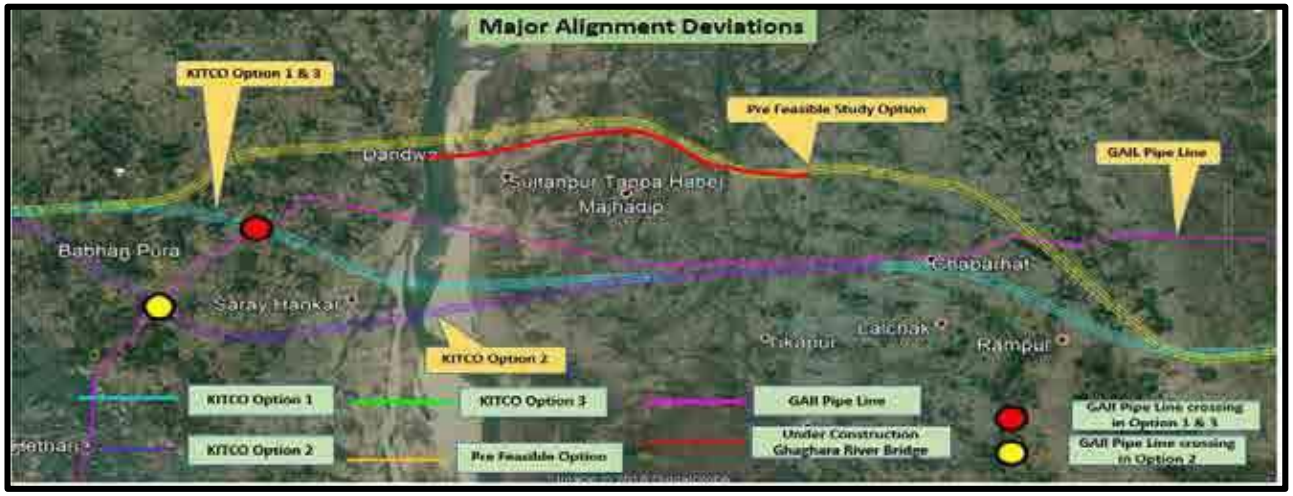


Figure 34: Major Alignment Deviations 2-From CH 35+400 to CH 48+000

3.1.4 Comparison of Alignment Options

Proposal for studying three alternative alignment options based on the prefeasibility study report was mainly because of crossing of GAIL pipelines and Ghaghara River crossing. The comparison of the 3 alignment is given in **Table 23** below.

Table 23: Comparison of Options

Criteria	Option 1	Option 2	Option 3
Length (Km)	89.539+1.581	87.875+1.581	87.435+1.581
River width at Crossing (Ghaghara) m	650	1040	1100
Ghaghara River Bridge Length (m)	≈ 1600	≈ 2500m	≈ 2400 m
Ghaghara River Bridge	Bridge portion in straight reach	Bridge portion in straight reach	Bridge Portion comes in curve
Horizontal Geometry	33 Curves	37 Curves	36 Curves
Settlement along alignment	26	29	31
Connectivity with hamlet	122	110	112
GAIL Pipe Line Crossing	Three Locations	One Location	One Location
Minimum Horizontal Curve radius	1200m	1200m	1200m

Out of the three options proposed, Option 1 is having GAIL pipe line crossing at 3 locations where as in the other two options GAIL pipeline crosses the alignments only at one location. However, Option 1is proposed with minimal horizontal curves along the alignment and minimal displacement of settlements on comparison with Option 2 and 3. Apart from the above, option 1 crosses River Ghaghara at its narrowest section after avoiding curves along the bridge reducing the construction cost considerably. Also option 1 ensures the maximum connectivity with the nearby hamlets on comparison with the other two options. Hence Option 1 is selected from the three proposed alternatives options proposed.

Also, after detailed topographical survey and geometric design of the final option, the length of alignment concludes to 89.771 km excluding the loop of interchanges proposed at the start and end point of the expressway.

3.2 Conclusion

Out of the three proposals for alignment, option 1 with less deviation from prefeasibility alignment option at the Ghaghara River crossing was selected as the final option. This option avoids the curve along bridge portion and bridge lies at straight stretch of the road. This will also reduce siltation and scouring of river bed at the Ghaghara River. In this option, bridge lies at the upstream of newly constructing bridge and length of the bridge will be minimal. After including the loop of interchanges proposed at the start and end point of the expressway, finalized alignment length comes to 91.352 km, which is the proposed alignment of Gorakhpur Link Expressway.

Chapter 4 Description of Environment

This chapter assesses the nature, type and dimensions of the study area and describes the physical, biological, cultural components along the proposed expressway. To ensure adequate integration of these components in project planning and design, CEIA is to be carried out which is a formal decision-making process for identifying the likely effects of particular activities or projects on the environment and human health. Hence establishment of baseline data in the project influence area is essential, besides helping to identify critical environmental attributes required to be monitored during and after the proposed improvements. Field inspection at all the sensitive locations, collection of secondary information for all the environmental components and discussions with the officials, NGO's and local public were conducted by the Consultants team. In order to assess the baseline environmental status of the project influence area, monitoring of various environmental attributes were conducted by the NABL accredited consultants during September 2021 to August 2022. The socio-economic profile has been distilled from the Census and the SIA Report.

4.1 Project Area

4.1.1 Corridor of Impact (CoI)

This consists of a strip of land on either side of the center line of the proposed alignment. 500 m width on either side of the center line has been adopted for detailed inventory of environmental features.

4.1.2 Project Influence Area (PIA)

In accordance with MoEF&CC EIA Guideline Manual for Highways and as per guidelines of EIA Notification-2006, the Project Influence Area has been defined as 15 km on either side (Arial distance) from boundary of road for collection of secondary data, including impacts due to ancillary sites like borrow areas, quarry, material storage, disposal areas, etc.

4.2 Study Period

Recent data on baseline environment component was collected from various sources of government departments such as India Meteorological Department at Uttar Pradesh, Central Ground Water Board, District and Taluk offices etc. The general information of each district was collected from district handbook for the period 2011. Rainfall, other climatic data such as temperature, relative humidity, wind speed, wind direction have been prepared by IMD, Uttar Pradesh for period of 1981-2010 (30 years data). Baseline environmental monitoring for various environmental attributes were conducted by the NABL accredited consultant for preparation of Comprehensive EIA was conducted for all the four seasons i.e. Pre-monsoon, Monsoon, Post-monsoon and Winter season from Sept 2021 to Aug 2022 whereas one season baseline data (Dec 18 to March 19) was collected during winter season in EIA report based on which the EC has already been accorded.

4.3 Land Environment

The components of land environment discussed in this section include:

- Geography and Topography
- Geology and Minerals
- Soil characteristics
- Land Use

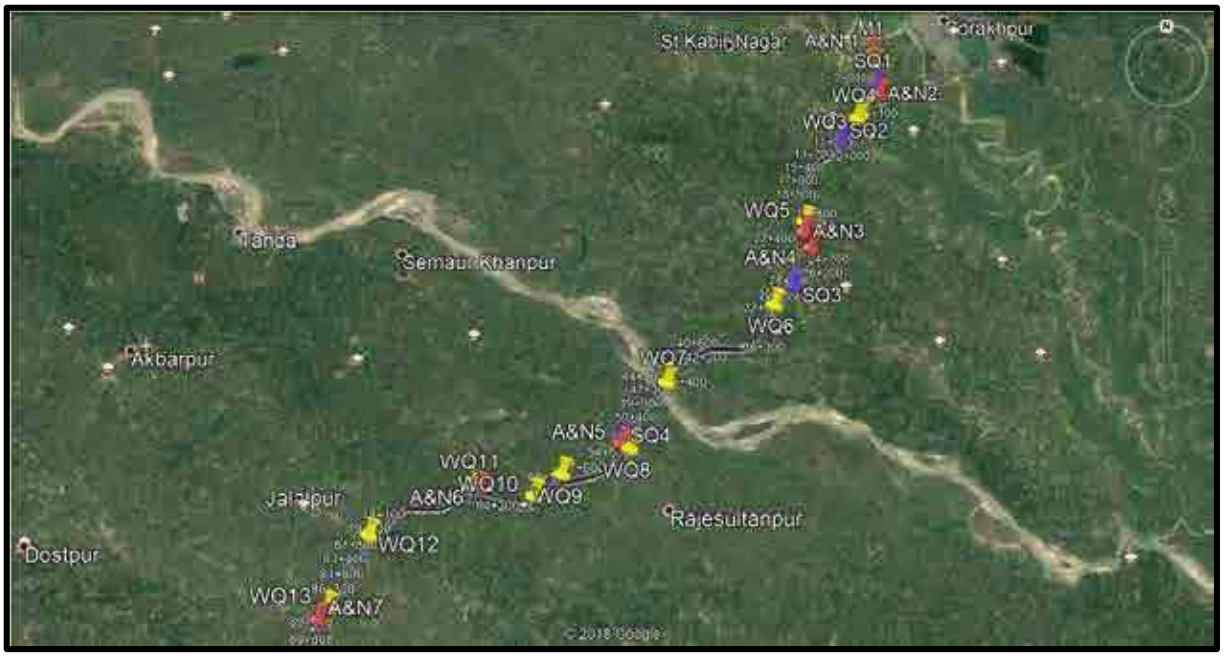


Figure 35: Sampling locations for Baseline Environmental Monitoring

4.3.1 Geography and Topography

Gorakhpur district covers area of 3484 Sqkm. The altitude is about 84m and it is lying between the latitude of 26°13'N & 27°06'N and between longitude of 83°05'E and 83°40'E. Azamgarh district is located in Uttar Pradesh. The district occupies an area of 4234 Km.

It is located at 26°04'N 83°11'E/ 26.06°N 83.19°E/ 26.06; 83.19. It has an average elevation of 64 meters (209 feet). The district is bounded by Mau district on the east, Gorakhpur district on the north, Ghazipur on the south-east, Jaunpur on the south-west, Sultanpur district on the west and Ambedkar Nagar district on the north-west. Azamgarh consists of a series of parallel ridges, whose summits are depressed into beds or hollows, along which the rivers flow; while between the ridges are low-lying rice lands, interspersed with numerous natural reservoirs.

The main occupation of the people of Azamgarh is agriculture. The soil is fertile, and very highly cultivated, bearing magnificent crops of rice, sugar-cane, wheat and orchards of mango and guava.

Geography of Azamgarh district comprises level plain without any hills, the only variations in the surface being caused by the dire lands along the streams that drain it. Except in the proximity of the Ghaghara River, the region slopes gently towards the south-east.

The proposed expressway alignment follows mostly plain terrain. Elevation varies from about 75m above MSL to 89m above MSL with average elevation of 82m. Proposed alignment mostly passes through the agricultural lands with patches of protected Forest and settlement areas. Some settlement areas are also located in close vicinity of proposed alignment.

The project corridor passes through plain terrain and does not come across protected zone. There is Military area near the start of the project. Project road generally passes through plain terrain. Both horizontal and vertical geometry of the road in plain terrain is good with very few horizontal curves. Maximum slope is found between chainage km 30.00 and km 60.00 and is of 16m slope difference. **Figure 36** shows the relief and slope of Gorakhpur district which represents the overall slope of the proposed area of alignment.

Table 24: Slope along the project road

Sl. No.	Existing Chainage in Km		Length in Km	Minimum slope(m)	Maximum slope(m)
	From	To			
1	0.00	30.00	30	75	85
2	30.00	60.00	30	73	89
3	60.00	90.00	30	82	87

Source: Reconnaissance survey.

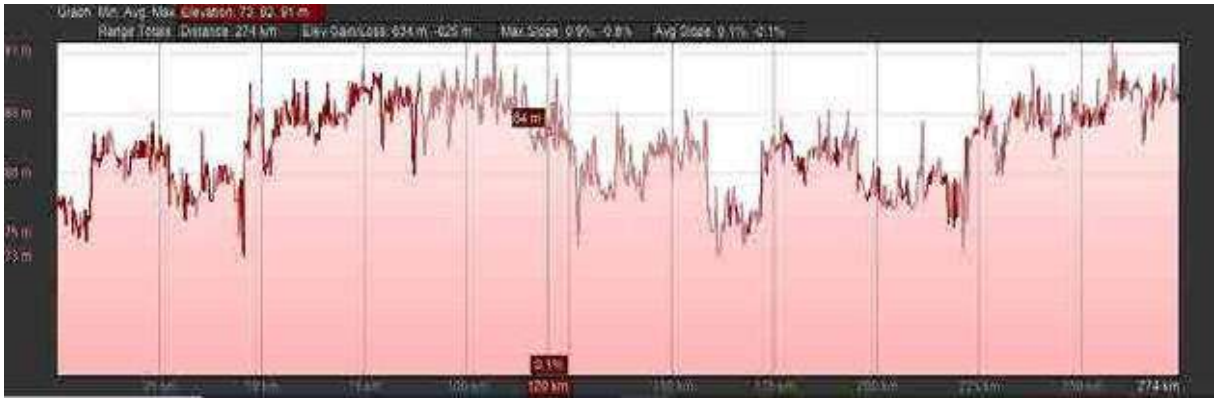


Figure 36: Terrain Profile of the Project Road

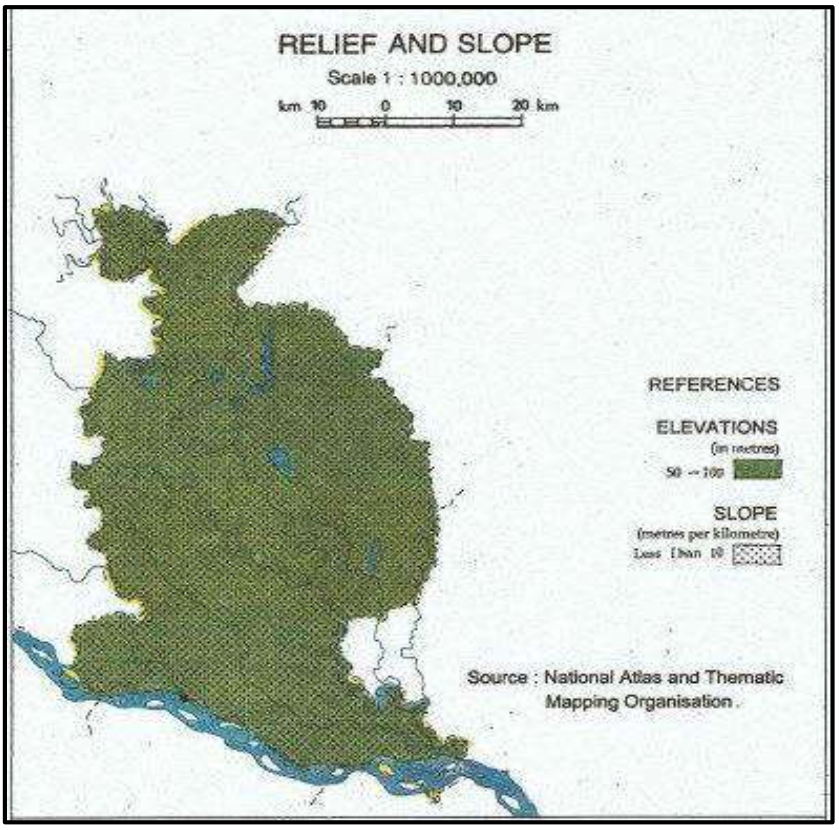


Figure 37: Map of the Gorakhpur district showing Relief and Slope

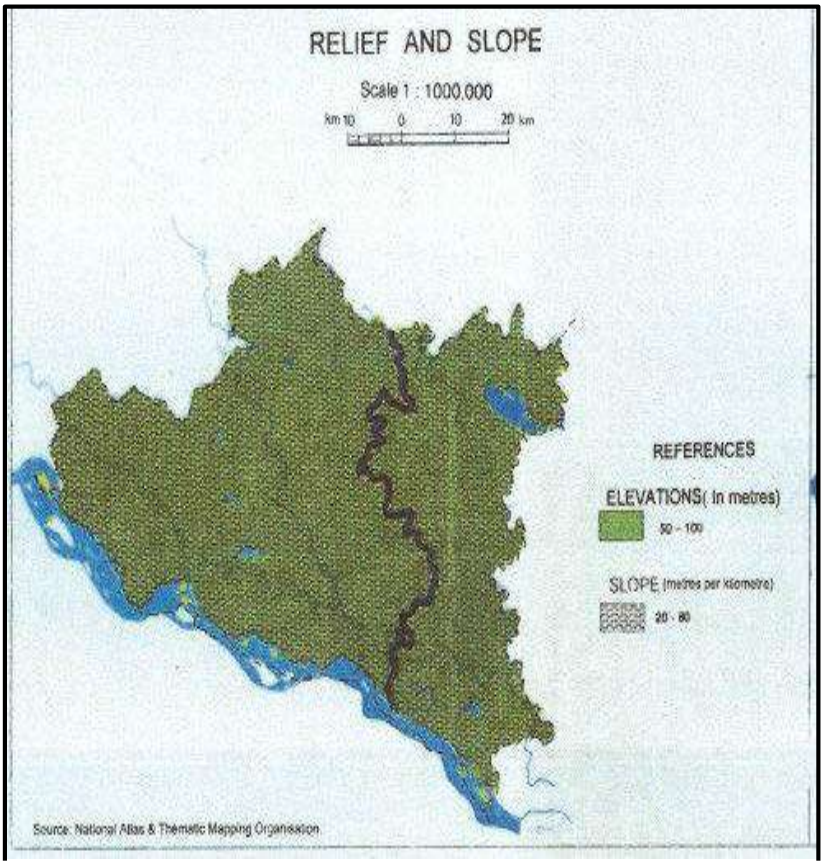


Figure 38: Map of the Sant Kabir Nagar showing Relief and Slope

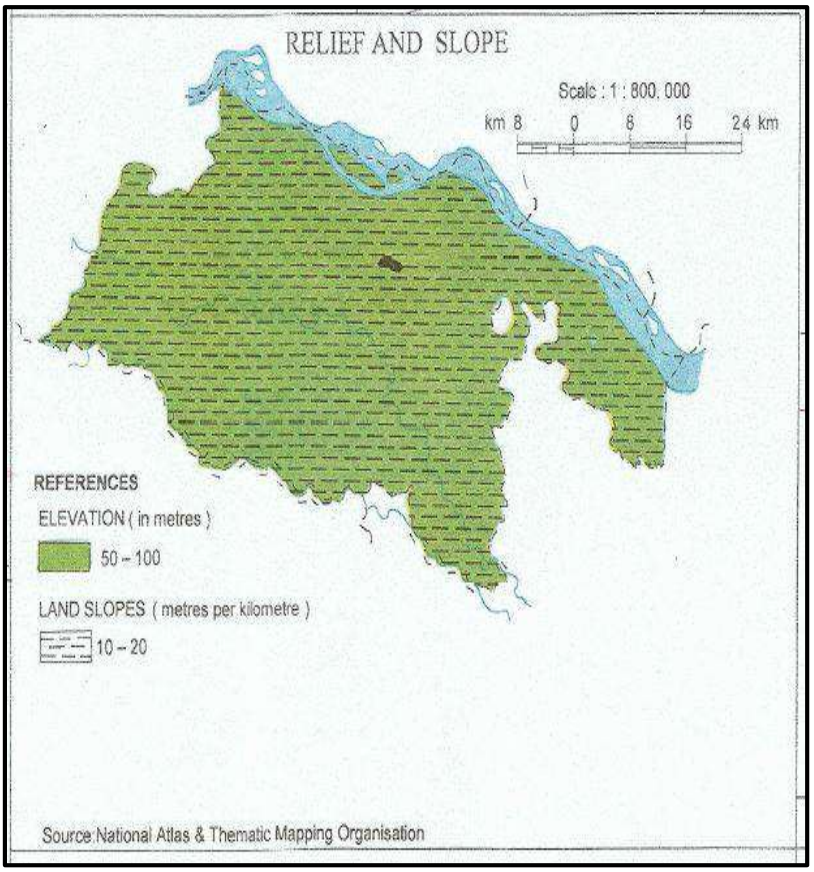


Figure 39: Map of the Ambedkar Nagar district showing Relief and Slope

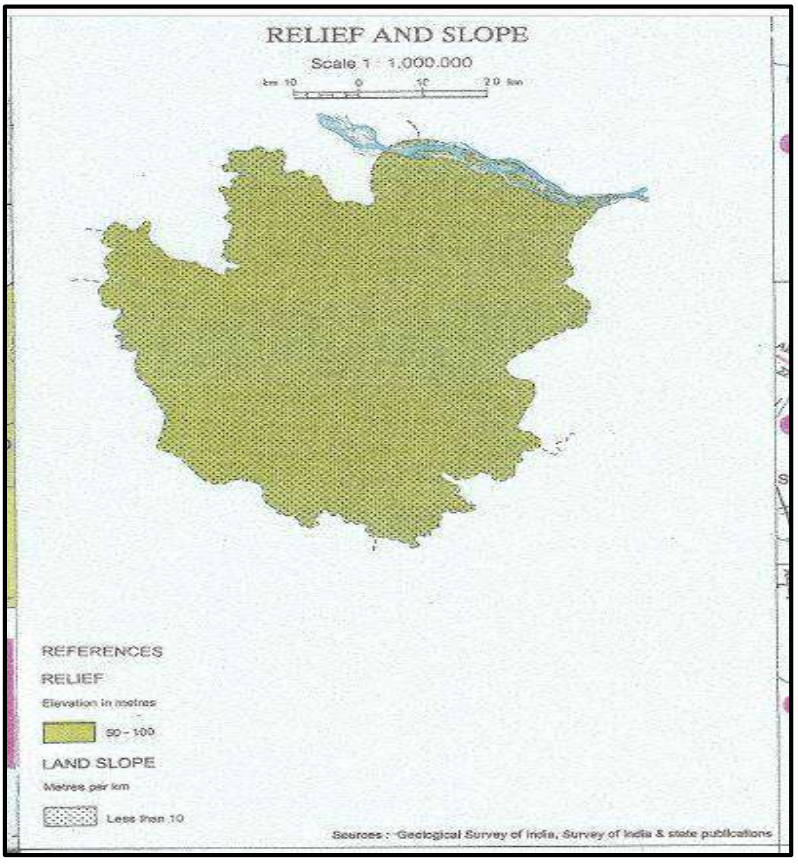


Figure 40: Map of the Azamgarh district showing Relief and Slope

4.3.2 Geology and Minerals

Particular emphasis was given to the understanding of the river bank characteristics at the Express Link way crossing sites, flood plain and sediment characteristics, erosion proneness of the rivers at the alignment crossings and regional tectonics. Additional inputs were assimilated from bore hole data of soil investigation reports, survey profiles, topographical and geological maps of the area and relevant geological literature pertaining to the region.

Geologically, the area falls under the Gangetic plain close to the Lower Himalayas. Rock assemblages include (1) sediments of the Varanasi Alluvium (Older alluvium), comprising polycyclic sequence of brownish, oxidized silt and clays with kankar and micaceous sands of Middle to Late Pleistocene age; (2) Terrace alluvium, consisting of grey, micaceous fine to medium grained sand and light brown to grey silt and clay and (3) Channel alluvium with micaceous, fine to coarse grained sand and overbank silt, the latter two belonging to the Holocene age. Spatial distribution of the sediments shows the older sediments, as a rule, cropping out away from the present river courses (GSI Maps).

Geomorphologically, the area forms part of a vast flood plain at an elevation of about 80m above msl within the provenance of the Ghaghara River, the major left bank tributary of the Ganga River. The former's head waters are from Karnali river, a trans Himalayan River originating from the upper Himalayas/Tibetan plateau. The river course within the impact area of the Express Link Way follows a broad northwest-south east direction with evidences of course change over time.

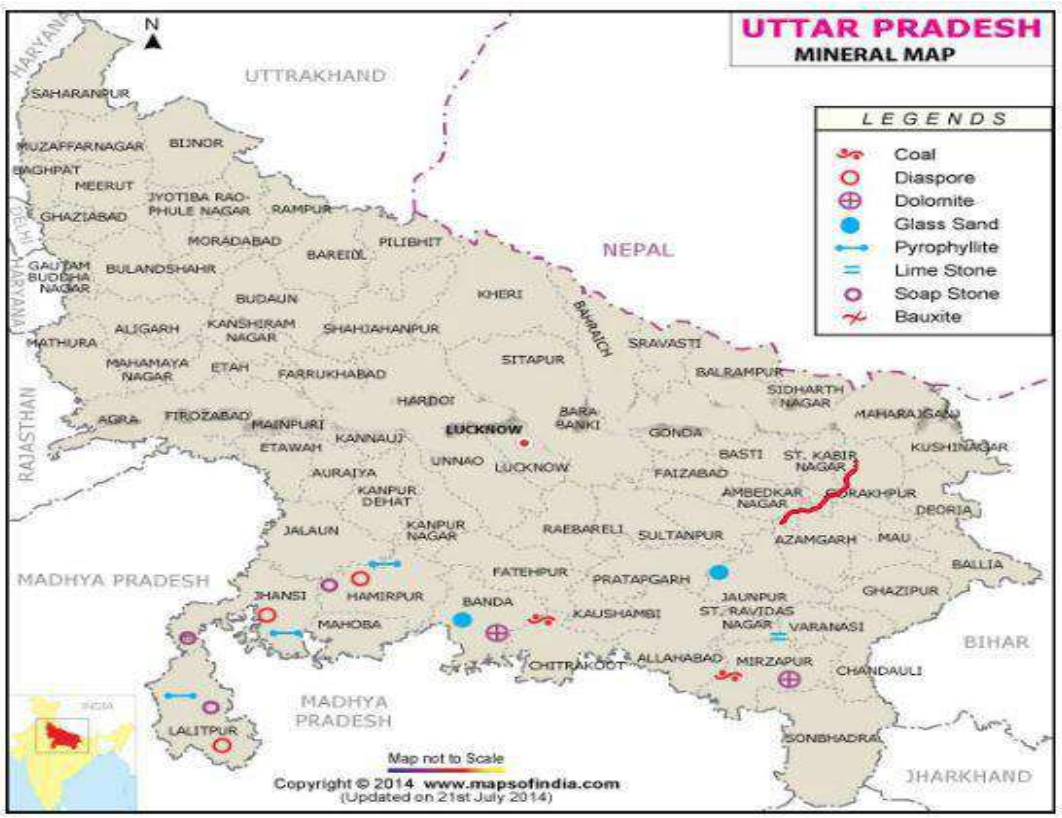


Figure 41: Map of the Project Area Showing Rocks and Minerals

4.3.3 Soil Characteristics

Project region is a part of Central Ganga Plains and is covered by Quaternary alluvial deposits. The older alluvial which occupies a large part of the area are locally known as 'Bhangar'. The soils of the region are mainly transported i.e. alluvial soil, comprising sand, silt and clay in varying proportions and rich in humus. The alluvial soils of the region are subdivided into older alluvial soil and younger alluvial soil. The older alluvial soil occupies high land and younger alluvial soils are restricted to marginal tract of Rapti and Ghaghra rivers and both are fertile. **Figure 42** shows the soil characteristics along the project road.

In order to have a better understanding of the soil characteristics of the project area, soil samples were taken and analysed for all important parameters at five locations. The Sample 1 (SQ 1) was drawn from Agriculture land at Bhagwanpur Bhakra Tiwari, Sample 2 (SQ 2) from Bharsi, Sample 3 (SQ 3) from Agriculture land at Akaunakhurd, Sample 4 (SQ 4) from Katohi and Sample 5 (SQ 5) from Shivpal.

The samples were collected by ramming a core-cutter into the soil up to a depth of 100 cm and soil samples were collected from three different depths viz. 30 cm, 60 cm and 90 cm below the surface. The samples from three different depths were homogenized and packed in a polythene plastic bag and sealed. The sealed samples were sent to laboratory for analysis of physical and chemical parameters and heavy metal concentrations.

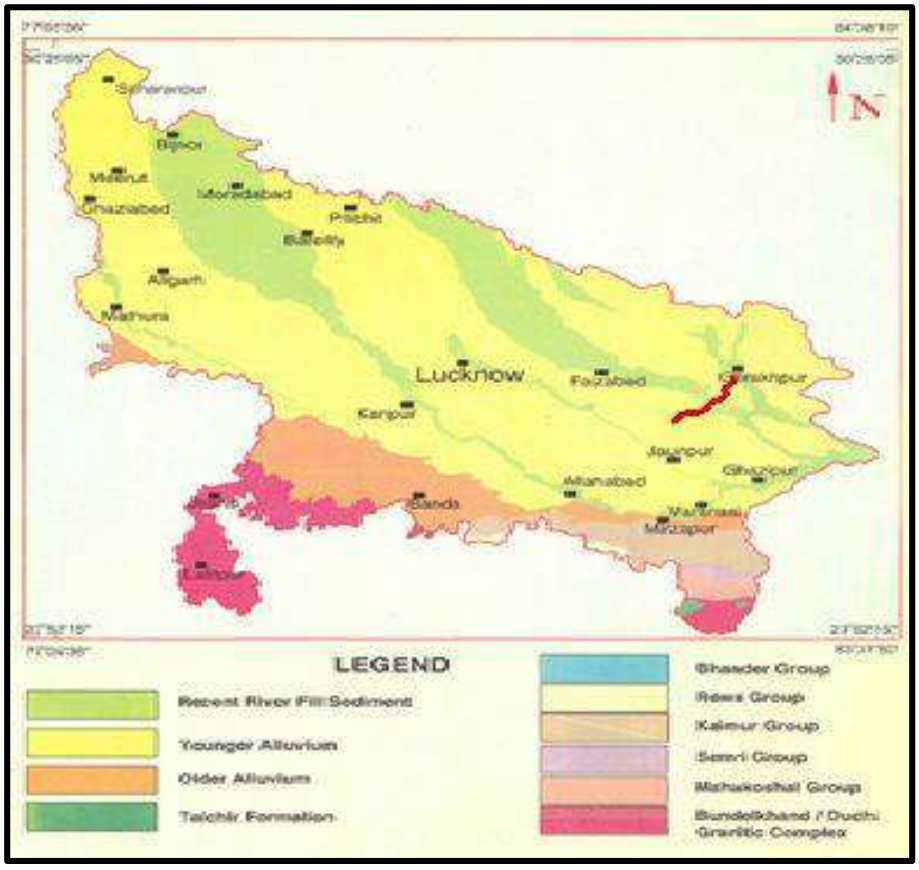


Figure 42: Map of the Project Area Showing Soil Characteristics

As per the monitoring result, the Sandy and Loamy soil was found to be predominant in the project area. pH of the soil varied from 7.2 and 8.0 there by indicating that soil is slightly alkaline in nature. Nitrogen content in SQ1, SQ2, SQ3, SQ4 and SQ5 was ranging from 0.0 to 0.1 percent, samples indicating nitrogen deficiency. Phosphorous content varies from 59.0 to 93.3 mg/kg. Potassium content in different soil samples varied from 116 to 277.6 mg/kg. Monitoring result is given as Annexure-II.

The analytical methods were used as per IS 2720. Physico-chemical properties such as particles size distribution, soil texture, bulk & particle density, porosity, water holding capacity, pH, cations, anions, nutrients, micronutrients, heavy metals etc. have been analyzed and studied in the villages of the study area as per specifications. Analysis results of the soil samples collected during the monitoring are presented in **Table 25.**

Table 25: Soil Analysis Results

S. No	Parameter	Units	Location (Sept 21 to Aug 22)										Test Method
			SQ-1		SQ-2		SQ-3		SQ-4		SQ-5		
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
1	Texture	-	Clay Loam	Clay Loam	Sandy Clay	Sandy Clay	Clay Loam	Clay Loam	Sandy Clay	Sandy Clay	Silt Clay Loam	Silt Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	34.4	36.5	45.4	49.9	43.5	46.1	45	47	18.6	43.4	UTRL/LAB/SOIL/SOP/05
	Clay	%	32.2	33.6	36.5	38.7	26.0	36.2	33	40	29.7	30.7	UTRL/LAB/SOIL/SOP/05
	Silt	%	31.2	32.0	13.0	18.1	19.8	27.9	14	19	26.9	50.7	UTRL/LAB/SOIL/SOP/05
2	pH (1:2.5 Suspension)	-	7.7	7.9	7.2	7.7	7.4	7.9	8	8	6.9	7.0	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	458.9	612.5	587.4	682.6	612.3	685.4	328	486	274.5	432.7	IS: 14767
4	Potassium (as K)	mg/kg	222.8	251.2	205.3	243.6	256.1	277.6	116	135	220.1	241.9	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	317.7	385.3	312.0	338.2	301.1	389.9	193	260	329.1	381.0	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4243.5	4811.8	4081.8	4322.8	4486.8	4713.1	4191	4551	3954.5	4603.1	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	535.5	657.8	676.7	757.6	551.6	629.4	505	739	681.6	901.5	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	1.2	1.4	1.2	1.2	1.1	1.4	1	1	1.2	1.4	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	30.5	33.5	29.9	31.7	33.5	35.6	30	34	43.5	52.1	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0.1	0.1	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	69.4	82.0	64.1	71.3	76.2	93.3	59	73	71.4	76.6	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.3	1.3	1.3	1.3	1.3	1.3	1	1	1.3	1.3	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.1	1.3	0.8	1.2	1.5	1.7	1	1	1.2	1.4	IS: 2720 (Part-22)
14	Porosity	%	41.2	42.1	42.0	42.5	36.0	40.4	42	43	39.9	40.5	UTRL/LAB/SOIL/SOP/17



Figure 43: Soil Sampling Photographs

4.3.4 Land Use

Proposed expressway mostly passes through important areas like agricultural lands, water bodies, forest areas (protected) and settlement areas. Some settlement areas are also located in close vicinity of proposed alignment.

Important towns affected are given in **Table 26**. The land use pattern of Uttar Pradesh state is shown in **Figure 44.**

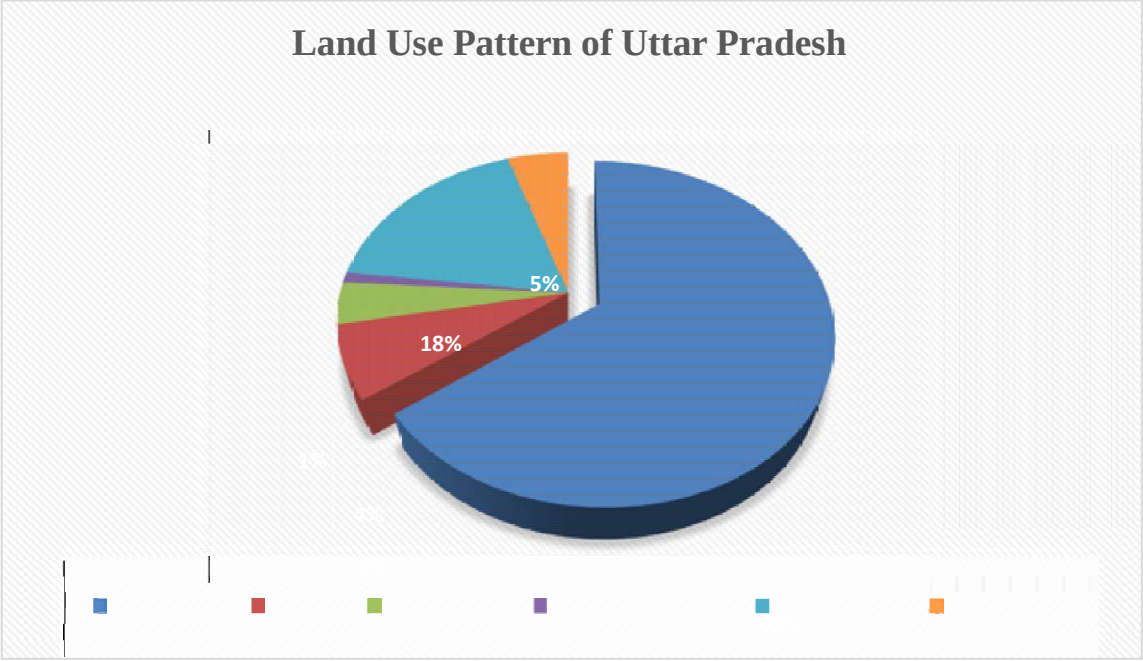
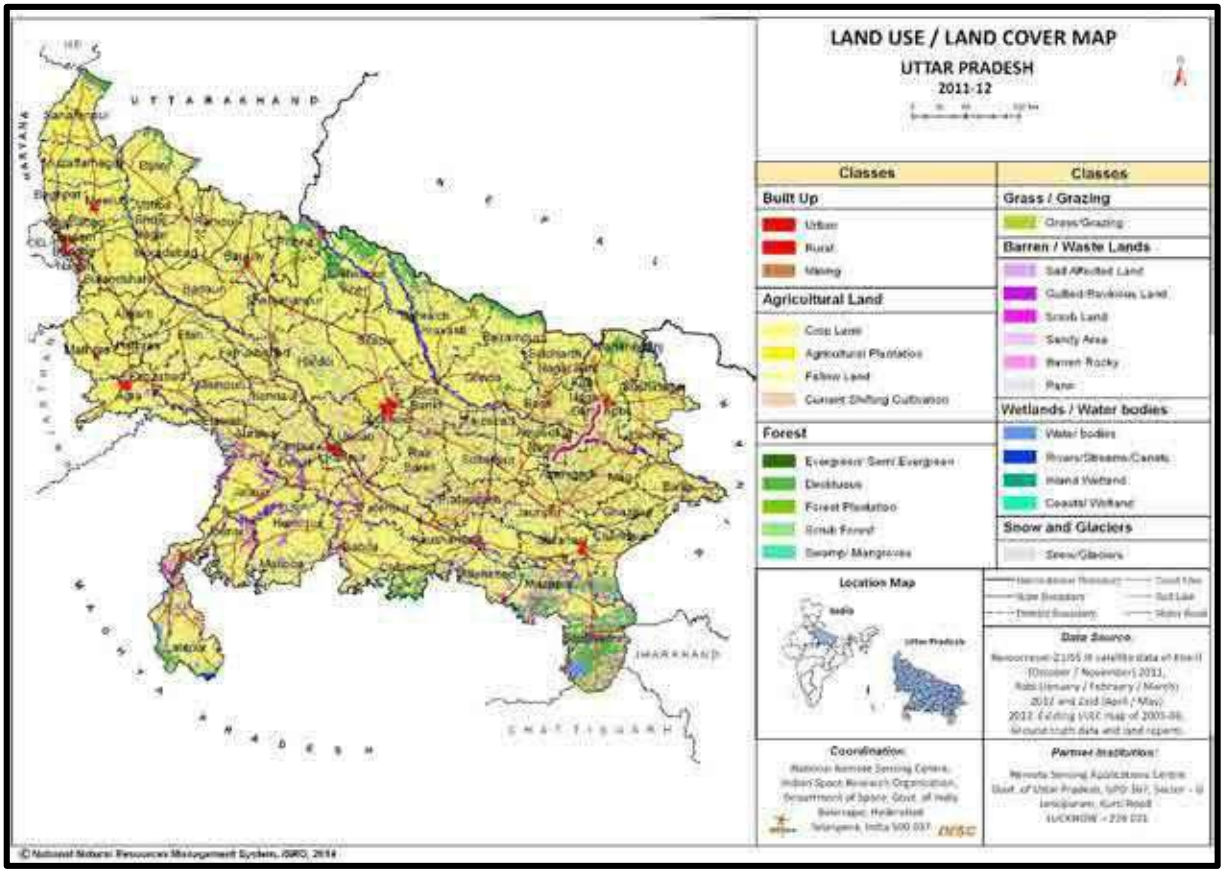


Figure 44: Land use Pattern of Uttar Pradesh

Source: based on SAGE/GTAP data



Figure 45: Agricultural Land use Pattern along the Alignment



Source: https://bhuvan.nrsc.gov.in/bhuvan_links.php

Figure 46: Map Showing Land Use Pattern of Uttar Pradesh

Table 26: List of Major Towns/Cities present along the Project Road

Sl.No	Important Towns/Cities	Distance from Proposed Expressway
1	Harnahi	0.5 km
2	Sikriganj	0.5 km
3	Kamariya Ghat	0.5 km
4	Bela Ghat	1.0 km
5	Khajani	2.2 km
6	Atraulia	3.4 km
7	Rajesultanpur	7 km
8	Jalalpur	7 km
9	Azamgarh	61 km
10	Lucknow	268 km

Source: Reconnaissance survey

4.4 Water Environment

4.4.1 Hydrology

4.4.1.1 Surface Water

Southern half of project region is drained by Ghaghara River system of which Tons and Gangi udanti & Beru are tributaries. The drainage system of the northern half represents a part of the Ganga basin and Ghaghra sub basin. The main river system is controlled by the Ghaghra river and its affluent in the region. The drainage of the entire project region is discharged into Ghaghra River. Tributaries of Ghaghra River are useful as sources for minor irrigation &

fisheries. Some ponds are getting affected due to proposed expressway alignments. Measures are required to maintain the volumetric capacity of the affected ponds.

The proposed Gorakhpur link expressway alignment crosses six rivers namely, Aami River (7+300), Kuwano River (31+700), Ghaghara River (46+000), Choti Saryu (63+700), Tons River (80+900) and Majohi river (88+500). Among the six, Ghaghara River is a major river originating from the lake Manasasarovar having a large catchment area.

Table 27: Details of Important Surface Water Bodies Crossing / Abutting the Project Road

Sl. No.	Chainage		Type of Water Body	Name of Water Body	Position with respect to CL
	From	To			
1	2.9	-	Nala	Nala	Crossing
2	4.9		Pond	-	Crossing
3	5.0	-	Water body		Crossing
4	6.2	-	Nala		Crossing
5	7.3	-	River Ammi		Crossing, flowing from Left to Right
6	13.1	-	GAIL pipe line		Crossing
7	17.5	-	Nala		Crossing
8	18.9	19	Pond		Crossing, RHS wrt CL
9	19.6	-	Pond		Crossing
10	20.2	-	GAIL pipe line		Crossing
11	20.5	-	Pond		Crossing
12	22.1	-	Pond		Crossing, LHS wrt to CL
13	22.3	-	Pond		Crossing, RHS wrt to CL
14	23.3	-	Pond		RHS wrt to CL
15	26	26.4	Pond		LHS wrt to CL
16	28.7	-	Pond		RHS wrt to CL
17	31.7	-	Kuwano River		Crossing, flowing from Left to Right
18	38.2	-	GAIL pipe line		Crossing
19	42	-	Ghaghara River Catchment starts		Crossing
20	45	46.5	Active river area		Crossing
21	51.6	51.7	Nala		Crossing, LHS wrt to CL
22	56.1	-	Pond		Crossing
23	57.6	-	Pond		Crossing
24	63.7	-	River	Choti Sariyu	Crossing, flowing from Right to Left
25	69.5	70.8	Nala		Crossing
26	78.3		Pond		Crossing
27	78.5	78.6	Canal		Crossing
28	80.9	-	Tons river		Crossing, flowing from Right to Left
29	88.5	-	Majhoi Nadi		Crossing, flowing from Right to Left

4.4.1.2 Ground Water

A systematic geophysical survey was conducted by Central Ground Water Board (CGWB) in the Uttar Pradesh district. The areas of these blocks are covered by different kinds of hard and soft rock formations and have different types of depositional environment. The prime objective of the surveys was to identify the different litho-units and granular zones occurring at different depths at selected sites for groundwater exploration. The other objectives include to estimate the thickness of alluvium formation, demarcation of different aquifer systems and to study the groundwater potential of Deccan Traps, Lametas and other metamorphic rocks. The resistivity surveys comprising Vertical Electronic Sounding (VES) and Gradient Resistivity Profiling (GRP) were conducted at villages for the above-mentioned blocks. The outcome of the study shows that the, ground water level is safe in Uttar Pradesh district. As per CGWB, ground water level in Gorakhpur district is safe.

The project alignment passes/abuts several ground waters bodies such as wells, hand pumps and deep tube wells.

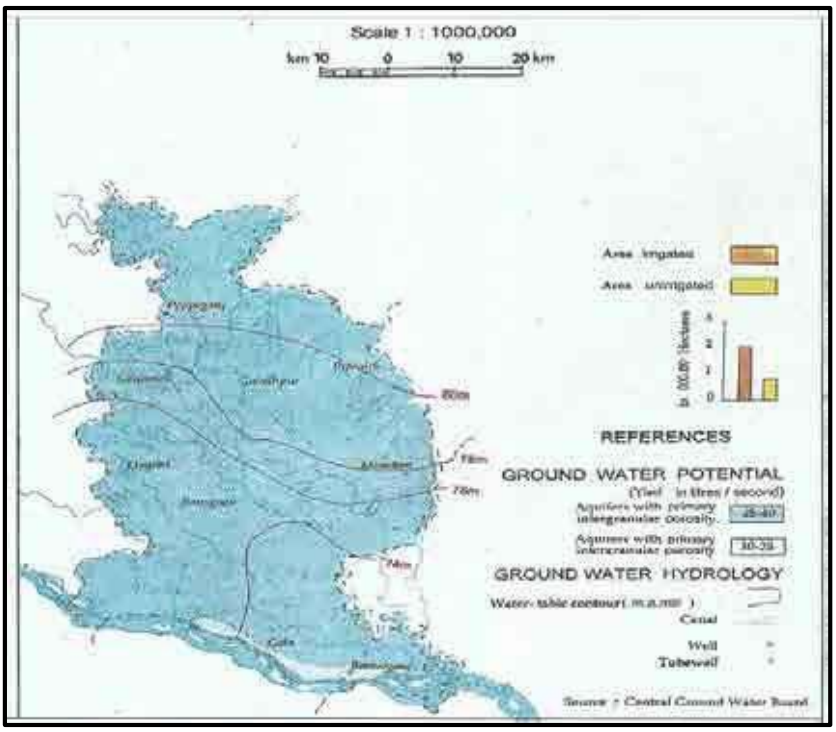


Figure 47: Map Showing Irrigation and Hydrogeology of Gorakhpur District

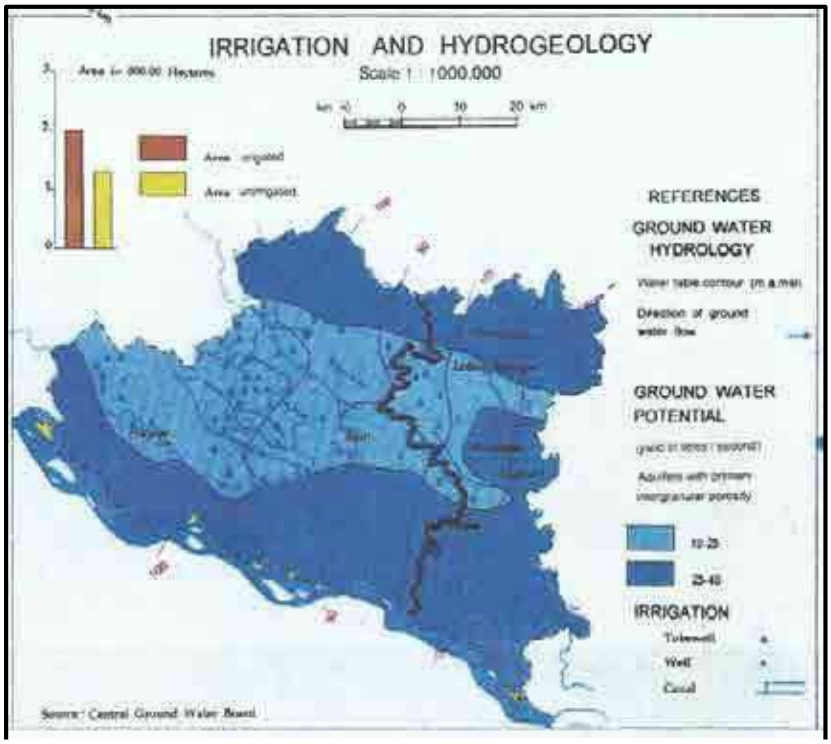


Figure 48: Map Showing Irrigation and Hydrogeology of Sant Kabir Nagar District

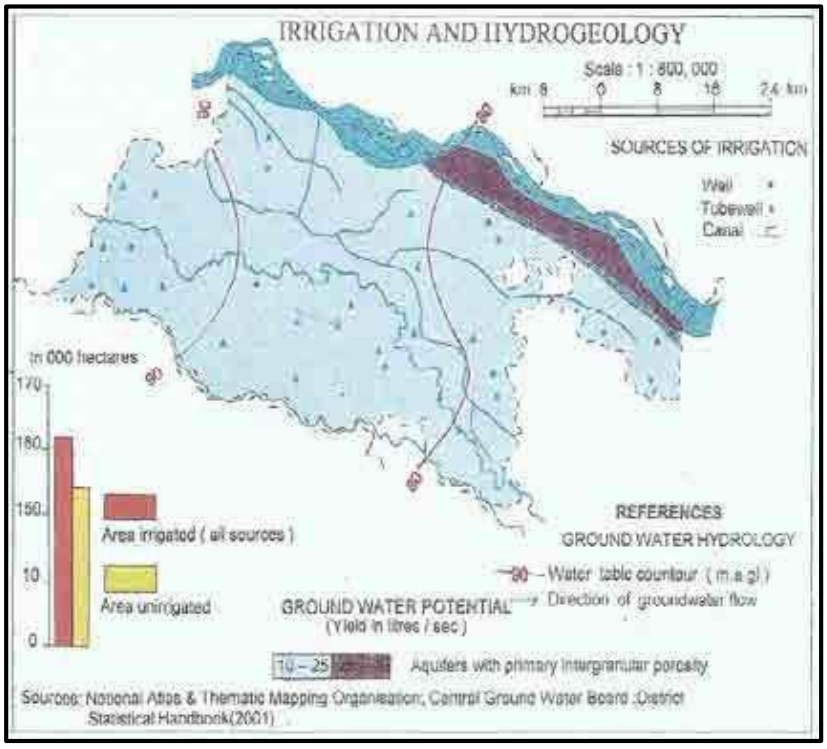


Figure 49: Map Showing Irrigation and Hydrogeology of Ambedkar Nagar District

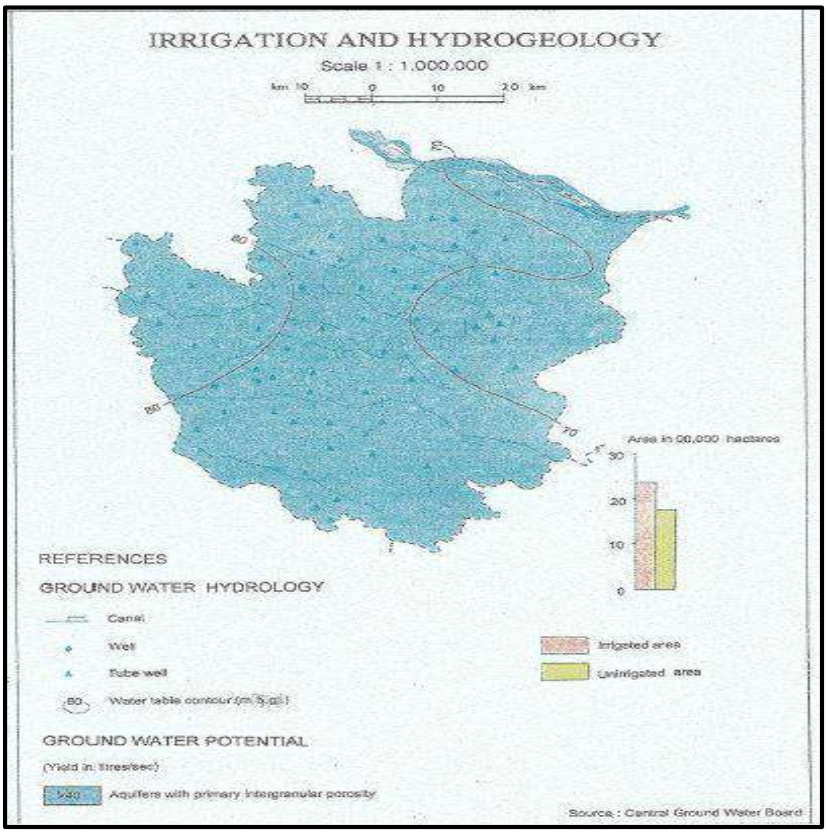


Figure 50: Map Showing Irrigation and Hydrogeology of Azamgarh District

4.4.1.3 Surface and Ground Water Quality

A highway project can significantly alter the hydrological setting of the project area by acting as an impediment to the natural drainage system of the region. It is therefore essential that all surface and ground water resources and their characteristics be identified and examine along the project road. The selection of parameters for both Surface and Ground water quality are as under:

Table 28: Water quality parameters & standards

Sr. No.	Particulars	Parameters	Environmental Setting	Standards
1	Surface Water Quality	Physical Parameters: TDS, TSS, Conductivity, Turbidity Chemical Parameters (Inorganic): pH, Alkalinity, Total Hardness, Chloride, Sulphate, Fluoride, Sodium, Potassium Heavy Metals: Pb, Fe Nutrient and Demand Parameters: Nitrate, Phosphate, DO, BOD, COD **Note:** DO, BOD & COD only for Surface Water Organic Parameters: Oil & Grease Bacteriological Parameters: Total Coliform & Fecal Coliform	Representative Surface water bodies crossing the project road that can be affected during envisaged construction activities.	IS 2296 Class-C for Drinking water source with conventional treatment followed by disinfection.
2	Ground Water Quality		Representative ground water sources samples from urban, semi-urban and rural location in the project area.	IS 10500: 2012 for Drinking purpose

Ground Water:

Ground water has been found to be an important source for catering to the local needs of water consumption for various purposes, mainly domestic. Establishment of baseline quality of ground water sources is critical to assess the potential impacts due to construction activities, if any, and to undertake necessary mitigation measures as suggested in Environmental Management Plan. Keeping in view the importance of ground water to the local population, four representative ground water quality-monitoring stations at Doharia Basdeo (GW1), Bidhanpur (GW2), Mahadevpur (GW3) and Muskarai village (GW4) in the study corridor were identified and analyzed for assessment of ground water quality.

Table 29: Ground Water Quality Monitoring Locations

Details of Ground water Monitoring carried out at site	Location
GW-1	Doharia Basdeo
GW-2	Bidhanpur
GW-3	Mahadevpur
GW-4	Muskarai



Figure 51: *Groundwater Sampling Photographs*

Table 30: Ground Water Analysis Results

S.No	Parameter	Test Method	Results (Sept 2021 to Aug 2022)								Units	Acceptable Limit	Permissible Limit
			GW1		GW2		GW3		GW4				
			Min	Max	Min	Max	Min	Max	Min	Max			
1	pH	IS:3025(Part-11)	7.47	7.65	7.1	7.3	7.3	7.7	7.1	7.5	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NTU	1	5
6	Total Hardness (as CaCO3)	IS:3025(Part-21)	320.0	348.0	284.0	340.0	240.0	264.0	344.0	380.0	mg/l	200	600
7	Calcium (as Ca)	IS:3025(Part-40)	89.6	121.6	92.2	108.8	76.8	84.8	110.1	121.6	mg/l	75	200
8	Magnesium (as Mg)	IS:3025(Part-46)	9.7	25.4	5.8	16.5	11.7	12.8	14.6	18.5	mg/l	30	100
9	Chloride (as Cl)	IS:3025(Part-32)	24.5	35.2	19.6	53.8	13.7	21.5	15.7	92.9	mg/l	250	1000
10	Iron (as Fe)	IS:3025(Part-53)	0.1	0.3	0.1	0.3	0.1	0.1	0.1	0.2	mg/l	0.3	No Relaxation
11	Fluoride (as F)	IS:3025(Part-60)	0.2	0.4	0.5	0.7	<0.1	<0.1	0.8	1.4	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	529.6	563.0	489.0	648.4	412.8	453.0	522.0	815.3	mg/l	500	2000
14	Phenolic Compound	IS: 3025 (Part-43)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.001max	0.002 Max

	(as C6H5OH)												
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.2	1.0
16	Sulphate (as SO_4)	IS:3025(Part-24)	14.4	20.7	13.7	31.2	9.8	13.2	8.9	15.4	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	6.4	9.5	1.9	2.3	0.2	1.1	0.2	1.5	mg/l	45	No Relaxation
18	Alkalinity (as CaCO3)	IS:3025(Part-23)	328.0	340.0	316.0	360.0	272.0	296.0	328.0	460.0	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	0.05

31	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)	E.Coli/100ml	Shall not be detectable in100 ml sample
32	Total Coliform	IS-1622	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

Observation:

The analysis results for ground water samples are given in Table above. The results with respect to drinking water standards as per IS: 10500 for all the parameters analyzed are found to be well within the impacts.

Surface Water:

Surface Water bodies in the project area include rivers, streams and nallahs. Rivers are important water sources in the local context and seasonal in nature. The Surface water quality was sampled and analysed at six locations as below:

Table 31: Surface Water Quality Monitoring Locations

Details of Surface water Monitoring carried out at site	Location
SW-1	Majohi River
SW-2	Aami Nadi at Dadauna
SW-3	Kuwano River at Trilokpur
SW-4	Ghaghra Nadi at Kamhariya Ghat
SW-5	Choti Saryu at Ltorikhalispur
SW-6	Tons River at Chodahprass





Figure 52: *Surface Water Sampling Photographs*

Table 32: Surface Water Analysis Results

S.No	Parameter	Test Method	Results (Sept 2021 to Aug 2022)						Units	Tolerance Limit as per IS:2296				
			SW1		SW2		SW3			Class A	Class B	Class C	Class D	Class E
			Min	Max	Min	Max	Min	Max						
1	pH	IS:3025 (Part-11)	6.95	7.46	6.86	7.32	7.13	7.43	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025 (Part-09)	16.80	30.80	16.50	30.20	16.20	30.60	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025 (Part-10)	17.80	36.30	14.20	23.80	3.40	13.60	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025 (Part-14)	304.84	532.85	303.23	458.82	315.16	407.73	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025 (Part-17)	47.00	80.00	24.00	32.00	21.00	29.00	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025 (Part-23)	76.00	184.00	76.00	164.00	104.00	144.00	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27^{0}C for 3 days)	IS:3025 (Part-44)	2.50	5.50	2.50	4.00	2.00	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025 (Part-38)	6.20	7.80	7.40	7.80	7.40	8.00	mg/l	6	5	4	4	-
9	Calcium (as Ca)	IS:3025 (Part-40)	16.00	34.40	16.64	23.04	24.96	36.48	mg/l	80	-	-	-	-
10	Magnesium (as Mg)	IS:3025 (Part-46)	9.72	20.90	10.69	21.00	6.80	14.77	mg/l	24	-	-	-	-
11	Chloride (as Cl), Max	IS:3025 (Part-32)	15.65	33.27	17.61	31.31	13.70	17.61	mg/l	250	-	-	-	600
12	Iron (as Fe), Max	IS:3025 (Part-53)	0.59	4.49	0.74	1.13	0.51	0.76	mg/l	0.3	-	50	-	-
13	Fluoride (as F), Max	IS:3025 (Part-60)	0.13	0.18	0.00	0.00	0.16	0.35	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025 (Part-16)	189.00	330.36	188.00	284.47	195.40	252.79	mg/l	500	-	1500	-	2100
15	Total Hardness (as $CaCO_3$)	IS:3025 (Part-21)	92.00	172.00	88.00	144.00	104.00	152.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4) Max	IS:3025 (Part-24)	28.87	45.09	23.15	38.08	14.00	22.29	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025 (Part-31)	1.07	3.05	0.69	1.07	0.43	1.46	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025 (Part-45)	12.52	23.29	14.09	25.05	9.59	12.33	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025 (Part-59)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromium (as Cr)	IS:3025 (Part-52)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025 (Part-49)	<0.1	0.18	<0.1	<0.1	<0.1	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025 (Part-45)	4.04	7.76	4.54	8.08	3.09	3.98	mg/l	-	-	-	-	-
23	Nitrate (as NO_3), Max	IS: 3025 (Part-34)	2.65	6.53	0.54	3.41	0.72	2.32	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025 (Part-41)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	-	0.01	-	-

25	Lead (as Pb)	IS:3025 (Part-47)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025 (Part-42)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025 (Part-58)	12.80	32.00	16.00	20.00	16.00	17.60	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025 (Part-37)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	0.2	0.2	-	

Remarks: -

Class A-Drinking water without conventional treatment but after disinfection.

Class B-Water for outdoor bathing.

Class C-Drinking water with conventional treatment followed by disinfection.

Class D-Water for fish culture and wild life propagation.

Class E-Water for irrigation, industrial cooling and control waste disposal.

S.No	Parameter	Test Method	Results (Sept 2021 to Aug 2022)						Units	Tolerance Limit as per IS:2296				
			SW4		SW5		SW6			Class A	Class B	Class C	Class D	Class E
			Min	Max	Min	Max	Min	Max						
1	pH	IS:3025(Part-11)	7.38	7.64	6.80	7.15	6.89	7.60	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.50	31.20	16.10	30.40	16.20	31.20	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	9.30	11.40	8.10	19.60	3.10	16.20	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	243.55	396.81	109.68	388.68	164.52	518.21	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	22.00	54.00	14.00	23.00	16.00	28.00	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	88.00	128.00	12.00	152.00	30.00	168.00	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27^{0}C for 3 days)	IS:3025(Part-44)	3.00	3.50	2.50	3.50	2.00	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.40	7.90	7.50	8.10	7.60	8.10	mg/l	6	5	4	4	-
9	Calcium (as Ca)	IS:3025(Part-40)	16.64	32.00	5.20	23.68	10.40	26.88	mg/l	80	-	-	-	-
10	Magnesium (as Mg)	IS:3025(Part-46)	11.66	18.08	4.13	21.58	4.86	24.49	mg/l	24	-	-	-	-
11	Chloride (as Cl), Max	IS:3025(Part-32)	9.78	23.48	3.91	13.70	8.81	39.14	mg/l	250	-	-	-	600
12	Iron (as Fe), Max	IS:3025(Part-53)	0.74	1.06	0.51	0.90	0.91	5.91	mg/l	0.3	-	50	-	-
13	Fluoride (as F), Max	IS:3025(Part-60)	0.00	0.00	0.00	0.00	0.18	0.18	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	151.00	246.02	68.00	240.98	102.00	321.29	mg/l	500	-	1500	-	2100
15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	104.00	128.00	30.00	148.00	50.00	168.00	mg/l	300	-	-	-	-

16	Sulphate (as SO_4) Max	IS:3025(Part-24)	24.59	29.20	21.04	27.32	12.75	29.89	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.48	8.86	0.72	2.58	1.07	1.85	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	6.85	16.44	2.74	9.59	6.16	27.40	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromium (as Cr)	IS:3025(Part-52)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	0.18	<0.1	<0.1	<0.1	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	2.21	5.30	0.91	3.20	2.05	9.13	mg/l	-	-	-	-	-
23	Nitrate (as NO_3), Max	IS: 3025 (Part-34)	0.53	1.93	0.53	1.23	0.62	1.12	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	20.00	16.00	20.00	9.60	24.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	0.2	0.2	-	

Remarks: -

Class A-Drinking water without conventional treatment but after disinfection.

Class B-Water for outdoor bathing.

Class C-Drinking water with conventional treatment followed by disinfection.

Class D-Water for fish culture and wild life propagation.

Class E-Water for irrigation, industrial cooling and control waste disposal.

Observation:

The analysis results for surface water samples are given in Table above. A brief description of surface water parameters is given below:

- pH and TDS values of surface water samples comply with the standards.
- Total Hardness of surface water samples found varying in different samples but are within the prescribed limit.
- Microbiological contamination is found in the surface water samples.

4.5 Air Environment

4.5.1 Meteorological factors and Climate

Eastern Uttar Pradesh has experience pleasant environment throughout the year. The climate of Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh district resembles that of eastern Uttar Pradesh. It is characterized by a rhythm of seasons, which are produced by south-west and north-east monsoon. The reversal of winds takes place twice a year.

The climate of the district may be classified into three distinct seasons:

• Cold weather season (Mid-November to February)
• Hot weather season (March to mid-June)
• Season of rains (Mid-June to mid-September)
• Post Monsoon season / transition period (Mid- September to October / Mid-November)

The cold weather season lasts from November to February. In November, the belt of high pressure extends from north-west India and covers the whole of the Uttar Pradesh. The temperature beings to decline and the maximum and minimum are 32.15°C and 8.95°C respectively, in this month. The prevailing winds blow from west to east and are influenced by the pressure distribution and pattern of the Himalayas.

Azamgarh experiences a humid subtropical climate with large variations between summer and winter temperatures. Summers are long, from early April to October with intervening monsoon seasons, and are also extremely hot, even by South Asian standards. The temperature ranges between 22°C and 46°C (72°F and 115°F) in the summers. Winters in Azamgarh see very large diurnal variations, with warm days and downright cold nights. Cold waves from the Himalayan region cause temperatures to dip across the city in the winter from December to February and temperatures below 5°C (41°F) are not uncommon. The average annual rainfall is 1,110 mm (44 in). Fog is common in the winters, while hot dry winds, called loo, blow in the summers.

The climate of the Sant Kabir Nagar is more equable than the adjoining districts to the south. The year may be divided into four seasons. The winter season, from mid-November to February is followed by the summer season lasting till about the middle of June. The period from mid-June to the end of September constitutes the south-west monsoon season. October to mid-November is the post monsoon or transition period. The average annual rainfall in the district is 1166 mm. During the winter seasons the mean minimum temperature is about 9 degree Celsius and means maximum 23 degree Celsius while during the summer seasons the minimum is about 25 degree Celsius and mean maximum is about 44 degrees Celsius. In the south-west

monsoon and the post monsoon seasons the relative humidity is high, being above 70 percent. Thereafter the humidity decreases and, in the summer, air is very dry. The district lies in the Ganga basin and Subbasin of Rapti River which is formed of alluvium of the early quaternary period. In the district, no hard or consolidated rock exposures are encountered. The main constituents (sand, silt and clay) of alluvium occur in variable proportions in different sections.

4.5.2 IMD Meteorological Data (30 Years Average)

Gorakhpur is the nearest IMD meteorological Centre to the project alignment site districts (Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh). Secondary information for the last 30 years on meteorological conditions was collected from the nearest IMD station at Gorakhpur. Pressure, temperature, relative humidity, rainfall, wind speed and direction are measured twice a day viz., at 0830 and 1730 hr. The climatologically data of IMD Gorakhpur is presented in Table given below:

Table 33: Climatological Data For IMD, Gorakhpur

Month	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	8:30 hrs	17:30 hrs	Mean
January	5.3	26.7	85	68	14.4
February	7.8	30.6	79	55	13.9
March	11.4	37.9	64	40	7.4
April	16.7	41.7	52	32	11.3
May	20.3	42.8	60	42	45.2
June	22.2	41.8	72	57	185.5
July	23.4	37.2	84	75	383.4
August	23.1	36.3	84	77	339.5
September	22.1	36.1	84	76	228.8
October	16.4	35.4	81	68	42.8
November	10.6	33	82	66	2.2
December	6.8	28.8	84	69	8.3
Range	**5.3-42.8**		**32-85**		**Total Rainfall =1282.7**

Source: Climatological Normals IMD, Gorakhpur (1981-2010)

4.5.2.1 Temperature

The annual mean maximum and minimum temperature recorded at IMD Gorakhpur have been given in Table 33. May and early part of June constitute the hottest part of the year. The mean daily maximum temperature in May is 42.8°C. The mean daily minimum temperature is 6.8°C. With the onset of the monsoon in June the day temperature drops down appreciably.

4.5.2.2 Rainfall

Monsoon season starts in June and goes on until mid of October. The intensity of the rainfall in monsoon is observed much higher than the rainfall occurs in other part of the year. The average monthly rainfall data and number of rainy days in a month are furnished in Table 33. Maximum rainfall occurs in the month of July and August.

4.5.2.3 Relative Humidity

The summer season is the driest part of the year when humidity levels go approx. 32% at night during April and May. July and August being the rainiest months experience highest humidity level of 84 % and 84% respectively in the morning. The annual mean relative humidity of 30 years is furnished in Table 33.

4.5.2.4 Wind Pattern & Speed

Table 34, it is evident that the average wind speed of the region annually is 4.1 km/hr or 1.14 m/s. The wind speed was found to be highest during the months of May and June. The predominant wind direction is west followed by east throughout the year. It is only during the monsoon season that the pattern varies and the predominant direction became strictly east.

Table 34: Wind Pattern & Speed

Months	Average Wind Speed (Km/Hr)	Average Wind Speed (m/s)	Pre - Dominant wind direction from (Directions)
January	2.7	0.75	W, SW & E
February	4.0	1.11	W, SW & E
March	4.5	1.25	W, E, SW & E
April	6.1	1.69	W & E
May	6.7	1.86	E , W & NE
June	6.1	1.69	E, NE & W
July	5.0	1.39	E & NE
August	4.1	1.14	E & NE
September	4.3	1.19	E, W & NE
October	2.5	0.69	W & E
November	1.7	0.47	W & E
December	1.8	0.5	W

Source: Climatological Normals IMD, Gorakhpur (1981-2010)

4.5.2 Onsite Micro Meteorology at Site

Meteorological station was set-up district wise in Gorakhpur, Ambedkar Nagar and Azamgarh to record meteorological data; during the study period i.e. September 2021 to August 2022 for Comprehensive EIA study. Wind speed and wind direction data recorded during the study period has enabled identifying the influence of meteorology on the air quality of the area. Based on the collected meteorological data, relative percentage frequencies of different wind directions were calculated and plotted as wind roses for twenty-four-hour duration. Maximum and minimum temperatures including percentage relative humidity were also recorded simultaneously.

It was observed that the predominant wind direction for Pre-monsoon season, Monsoon Season, Post- monsoon season and winter season was East, West, East and West respectively. Wind Rose Diagram showing the wind pattern during the period Sept 21 to Aug 22 is shown in Figure 53.

The wind recorded during the survey period at the site is more or less according to the trend indicated in IMD data (Gorakhpur). The average micro-meteorology of study region in given in Table 35 below.

Table 35: Climatological Data for IMD, Gorakhpur

Month	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Wind Speed (mph)	Predominant Wind Direction
	Min	Max	8:30 hrs	17:30 hrs	Mean		
September 2021	25.5	27.8	81	93	0.0	6	E
October 2021	25	32.2	64	90	0.0	3	E
November 2021	15.0	26.7	40	87	0.0	1.0	Calm
December 2021	12.7	25.0	40	81	0.0	2.0	W
January 2022	8.89	11.7	74	83	0.0	2.0	W
February 2022	13.3	25.0	32	77	0.0	2.0	W
March 2022	22.2	32.8	40	80	0.0	3.0	E
April 2022	25.0	40.5	08	57	0.0	4.0	Calm
May 2022	26.6	39.4	32	68	0.0	6.0	E
June 2022	27.7	37.2	42	74	0.0	1.0	W
July 2022	31.1	36.7	50	79	0.0	6.5	E
August 2022	27.2	36.1	54	84	0.0	1.0	W

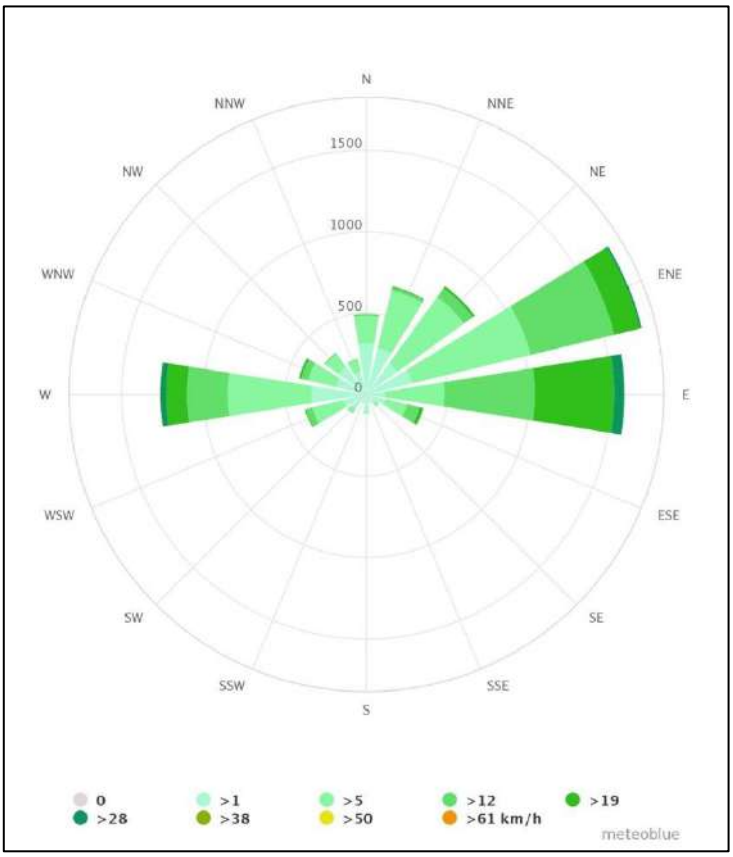


Figure 53: Windrose Diagram of Gorakhpur (Sept 21 to Aug 22)

4.5.3 Ambient Air Quality

A network of six ambient air-sampling locations has been selected for assessment of the existing status of air environment within the study zone. The selection of monitoring locations has been distributed throughout the study area so as to get representative baseline of any variation in land use as well as road geometrics and traffic conditions across the project road including the baseline at Sensitive Receptors along the project. The heights of the sampling locations were kept between 4.0 to 6.0 m in all the locations. The selected locations of ambient air monitoring and details of surroundings are presented in Table as under:

Table 36: Air Quality Monitoring Locations

Location Code	Location, Chainage
AQ1	Chapiya Fish Farming Office at Narkatha (Start of Alignment -NH)
AQ2	Ch. 36+800
AQ-3	Chaudia Masan
AQ-4	Daswat Pur Ethiya
AQ- 5	Mahadevpur
AQ-6	Mutkallipur (End of Alignment)

The monitoring of the Ambient Air Quality (AAQ) along the project corridor was carried out at each selected location as per guidelines of Central Pollution Control Board (CPCB) and the requirements of MoEF&CC.



Figure 54: Ambient Air Monitoring Sampling Photographs

The ambient air quality monitored results (season wise) and their comparison with baseline monitored results have been presented in the following tables:

Table 37: Summary of Ambient Air Quality Results

Quarter 1 (Sept 21 to Nov 21)

Location Code		AQ1	AQ2	AQ3	AQ4	AQ5	AQ6
$PM_{10}(\mu g/m^3)$	Min	71.03	71.58	73.49	71.65	71.92	72.19
	Max	86.55	85.39	85.22	85.88	83.57	88.40
	Avg	81.09	80.01	79.62	80.21	78.78	81.87
	98 %tile	86.47	85.31	85.08	85.71	83.54	87.88
$PM_{2.5}(\mu g/m^3)$	Min	37.55	35.51	35.29	35.64	36.11	35.06
	Max	44.72	44.23	43.82	44.69	42.79	48.41
	Avg	41.15	40.77	39.59	40.26	39.28	41.62
	98 %tile	44.25	43.79	43.26	44.66	42.73	48.25
$SO_2(\mu g/m^3)$	Min	9.67	9.76	9.62	9.60	9.60	9.68
	Max	12.52	12.71	12.31	12.31	11.84	12.47
	Avg	11.02	11.13	10.84	10.98	10.64	10.91
	98 %tile	12.51	12.50	12.29	12.24	11.79	12.36
NO_2 ($\mu g/m^3$)	Min	18.79	18.39	18.54	18.26	18.37	18.55
	Max	22.22	23.51	22.85	23.85	22.87	23.88
	Avg	20.88	21.28	20.87	20.97	20.65	21.57
	98 %tile	22.09	23.06	22.60	23.64	22.68	23.64
CO (mg/m^3)	Min	0.55	0.53	0.53	0.53	0.52	0.52
	Max	0.61	0.59	0.60	0.60	0.60	0.59
	Avg	0.58	0.57	0.57	0.56	0.56	0.55
	98 %tile	0.61	0.59	0.60	0.60	0.59	0.59

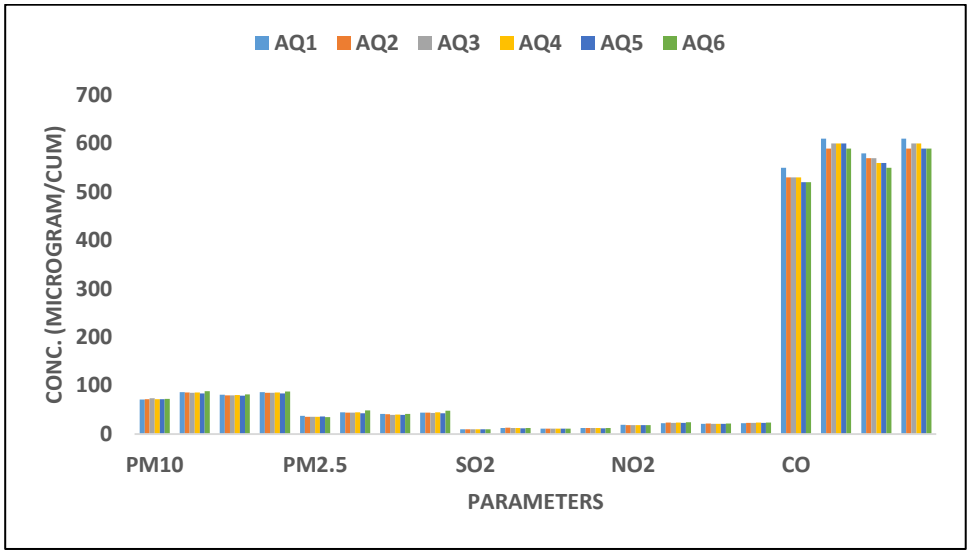


Figure 55: Baseline results at monitoring stations

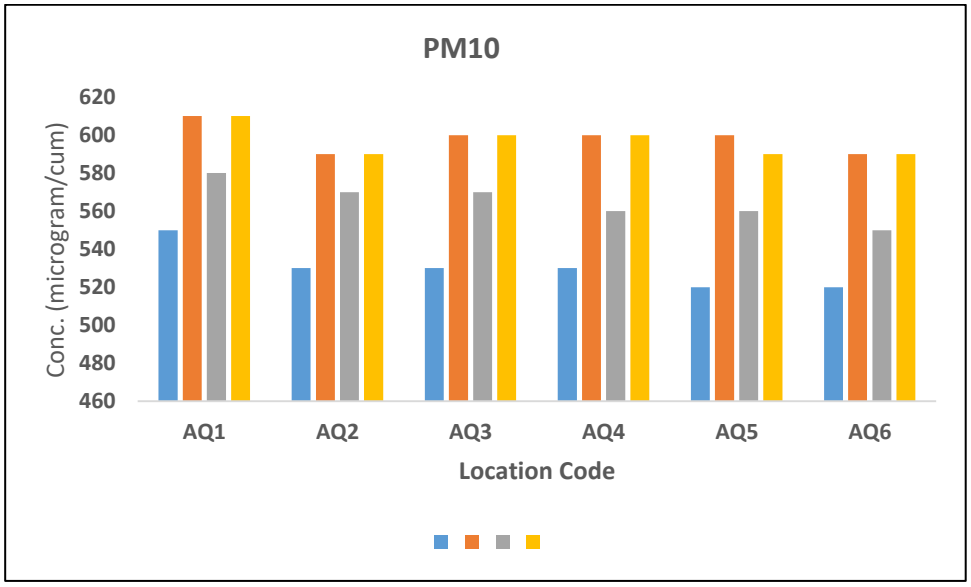


Figure 56: PM10 Monitoring results

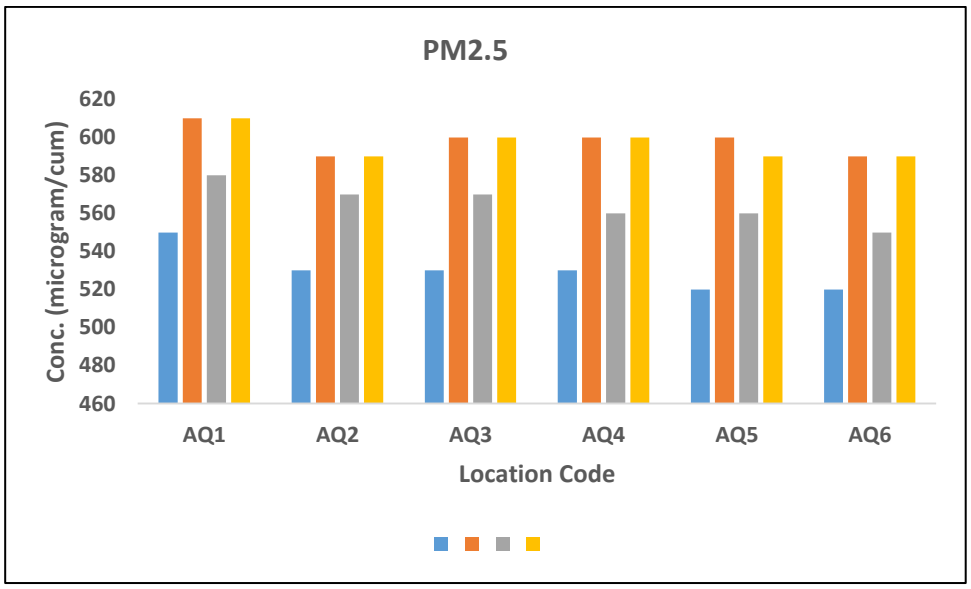


Figure 57: PM2.5 Monitoring results

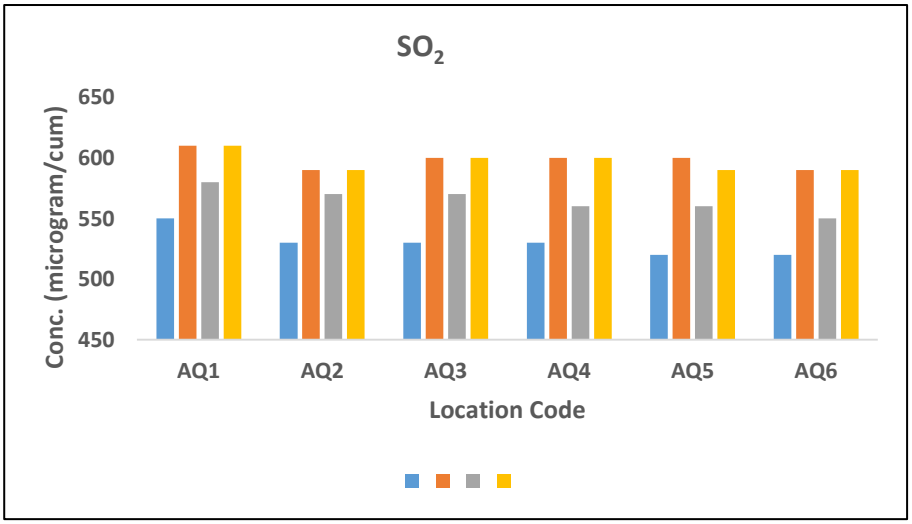


Figure 58: SO2 Monitoring results

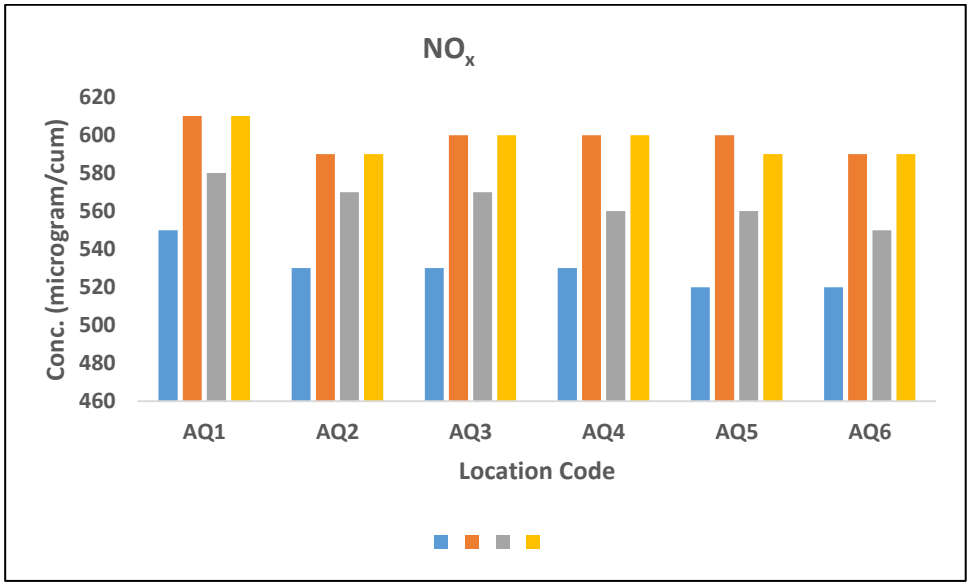


Figure 59: NOx Monitoring results

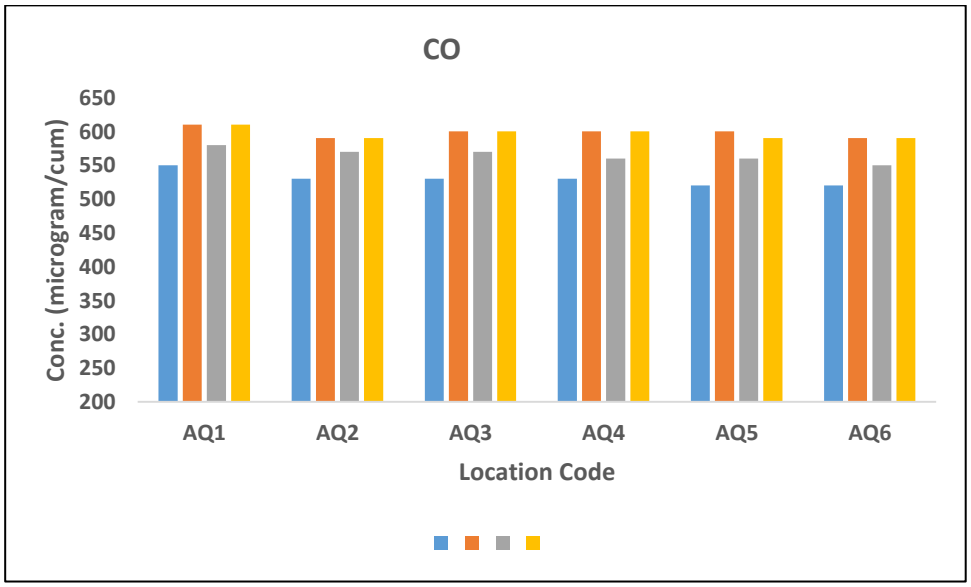


Figure 60: CO Monitoring results

Quarter 2 (Dec 21 to Feb 22)

Location Code		AQ1	AQ2	AQ3	AQ4	AQ5	AQ6
$PM_{10}(\mu g/m^3)$	Min	86.07	83.30	79.73	81.33	81.05	85.27
	Max	95.44	88.65	89.96	90.11	85.58	97.14
	Avg	89.91	85.95	84.51	86.32	83.49	90.30
	98 %tile	95.41	88.45	89.57	89.51	85.49	96.38
$PM_{2.5}(\mu g/m^3)$	Min	44.75	43.18	38.08	42.08	41.12	45.03
	Max	57.09	47.82	48.90	47.89	45.56	55.66
	Avg	49.66	45.24	43.22	45.25	43.52	50.02
	98 %tile	56.34	47.63	48.76	47.47	45.51	55.14
$SO_2(\mu g/m^3)$	Min	12.50	43.18	9.77	11.21	10.06	10.35
	Max	16.05	47.82	13.62	13.61	12.42	14.43
	Avg	13.76	45.24	11.76	12.55	11.20	12.38
	98 %tile	15.62	47.63	13.53	13.53	12.34	14.32
NO_2 ($\mu g/m^3$)	Min	22.34	20.02	18.56	22.48	20.64	22.17
	Max	25.34	23.66	25.16	25.69	24.54	26.29
	Avg	23.95	22.32	22.11	24.21	22.34	23.95
	98 %tile	25.27	23.61	24.58	25.56	24.43	26.04
$CO(mg/m^3)$	Min	0.55	0.54	0.53	0.55	0.53	0.55
	Max	0.71	0.67	0.67	0.74	0.61	0.71
	Avg	0.64	0.60	0.58	0.63	0.57	0.64
	98 %tile	0.71	0.67	0.66	0.72	0.61	0.71

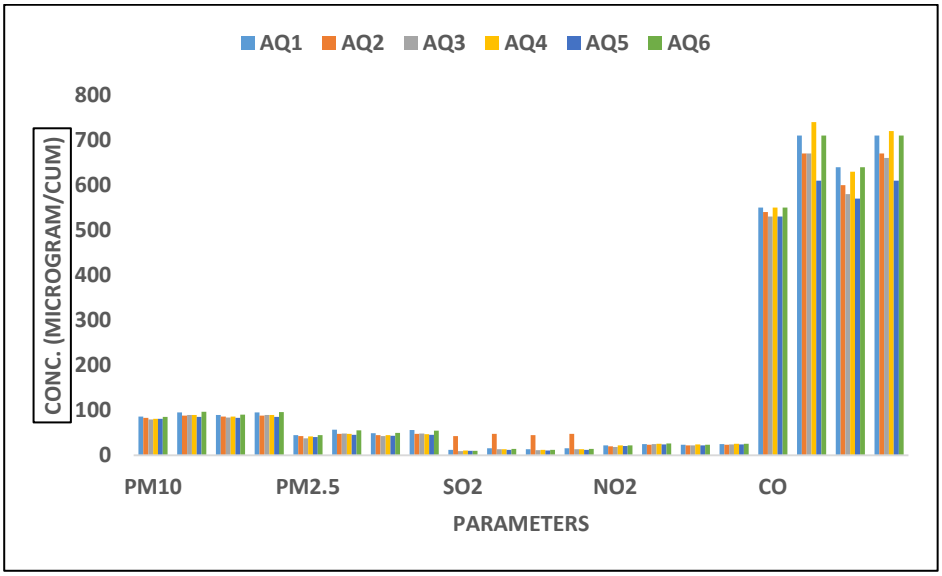


Figure 61: Baseline results at monitoring stations

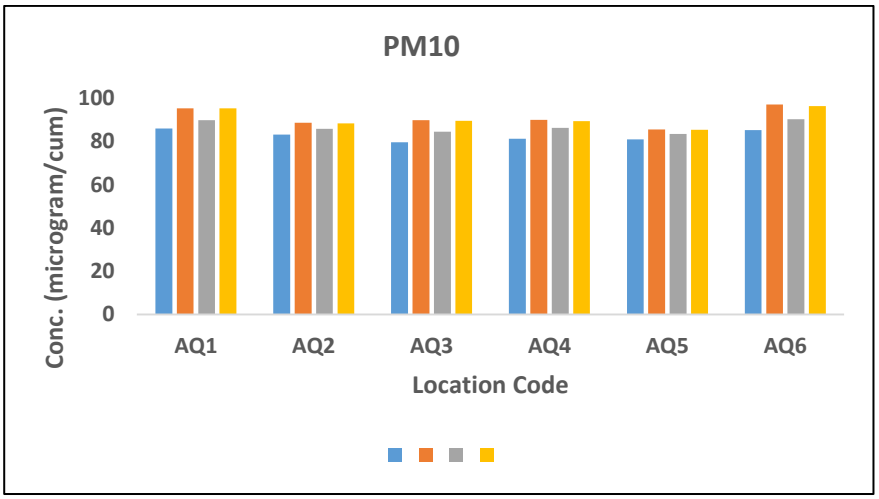


Figure 62: Figure: PM10 Monitoring results

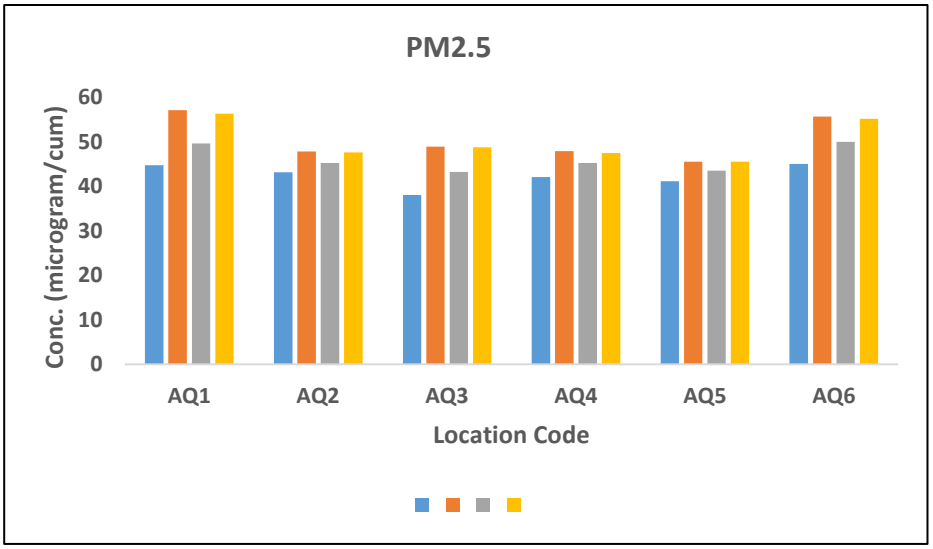


Figure 63: Figure: PM2.5 Monitoring results

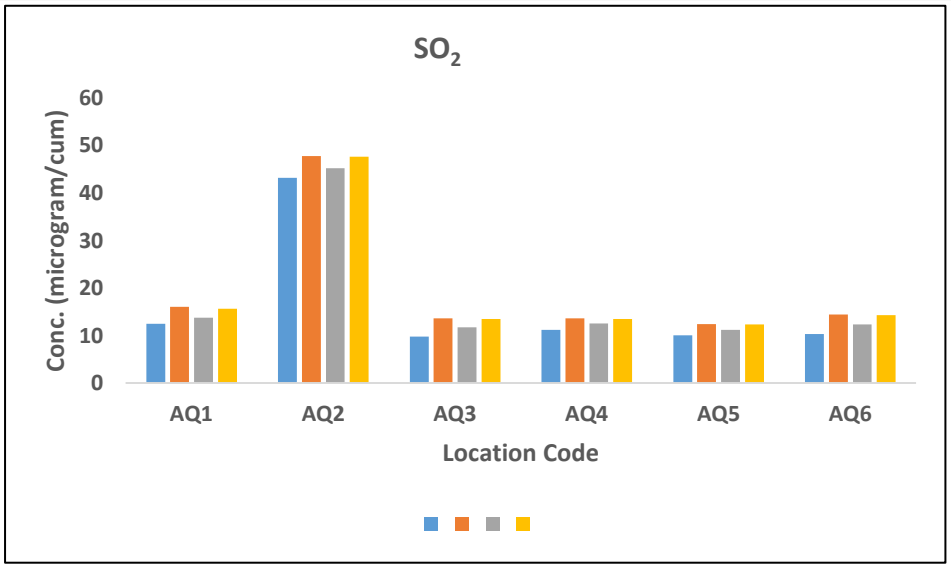


Figure 64: Figure: SO2 Monitoring results

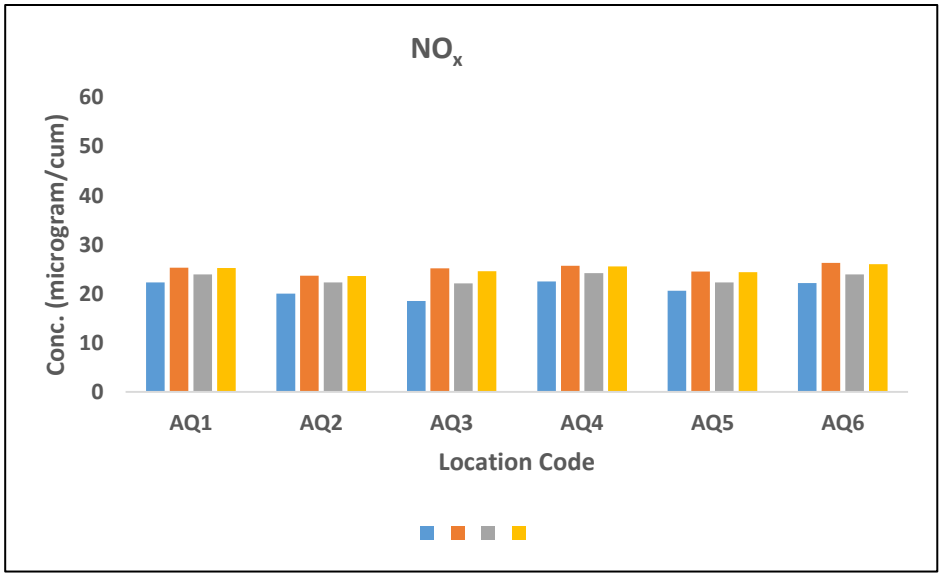


Figure 65: Figure: NOx Monitoring results

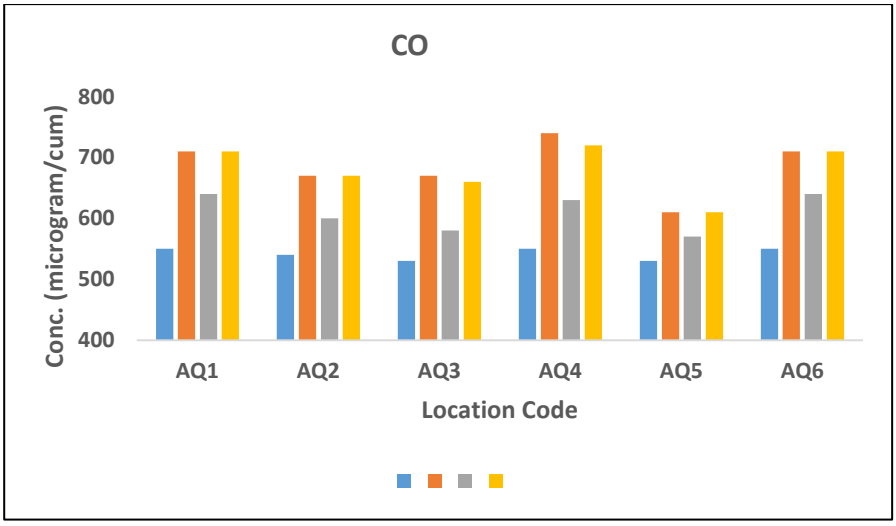


Figure 66: Figure: CO Monitoring results

Quarter 3 (March 22 to May 22)

Location Code		AQ1	AQ2	AQ3	AQ4	AQ5	AQ6
$PM_{10}(\mu g/m^3)$	Min	84.35	81.43	81.16	80.59	81.43	82.11
	Max	92.90	89.79	91.77	92.06	90.30	96.67
	Avg	87.74	85.50	85.46	86.23	85.46	88.16
	98 %tile	92.73	89.25	90.92	91.40	89.62	95.45
$PM_{2.5}(\mu g/m^3)$	Min	44.07	41.46	41.65	40.51	41.36	41.69
	Max	52.44	49.17	51.36	52.30	50.31	56.97
	Avg	47.69	45.64	45.49	46.05	45.32	48.16
	98 %tile	52.30	49.03	50.65	51.58	49.42	55.62
$SO_2(\mu g/m^3)$	Min	10.85	9.88	9.79	10.91	9.67	10.68
	Max	14.23	13.62	14.38	14.07	14.57	14.51
	Avg	12.88	11.55	12.34	12.33	11.99	12.70
	98 %tile	14.18	13.40	14.32	13.99	14.37	14.45
NO_2 ($\mu g/m^3$)	Min	20.83	18.82	19.56	20.45	19.82	20.67
	Max	25.47	24.54	25.06	25.37	25.49	25.47
	Avg	22.95	21.73	22.25	23.22	22.15	22.96
	98 %tile	25.12	24.09	24.82	25.34	25.09	25.43
$CO(mg/m^3)$	Min	0.54	0.53	0.52	0.55	0.53	0.54
	Max	0.72	0.69	0.68	0.71	0.63	0.72
	Avg	0.64	0.60	0.59	0.62	0.58	0.63
	98 %tile	0.72	0.69	0.67	0.71	0.63	0.72

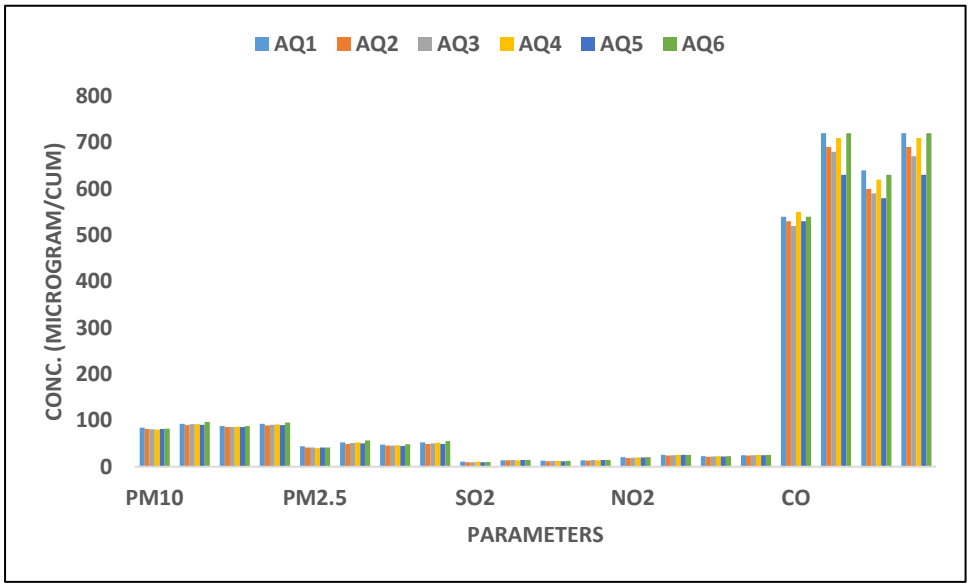


Figure 67: Baseline results at monitoring stations

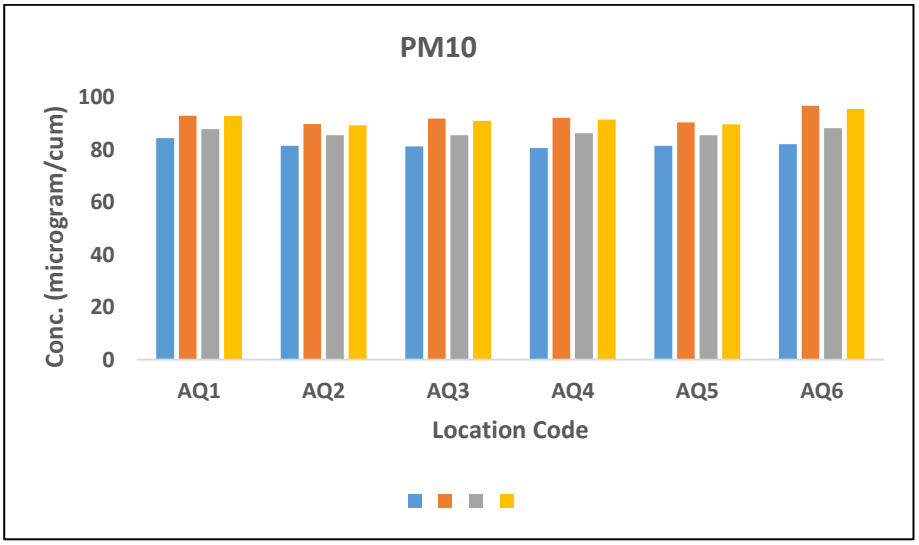


Figure 68: PM10 Monitoring results

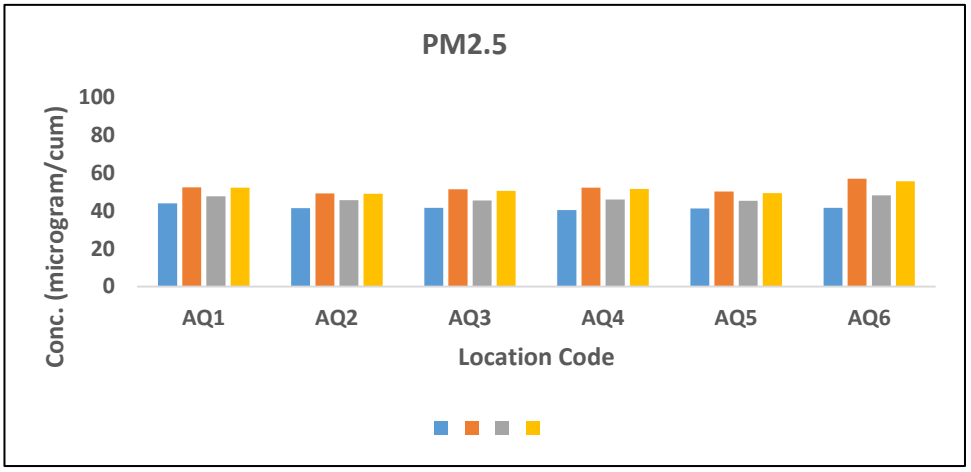


Figure 69: PM2.5 monitoring results



Figure 70: SO2 Monitoring results



Figure 71: NOx Monitoring results

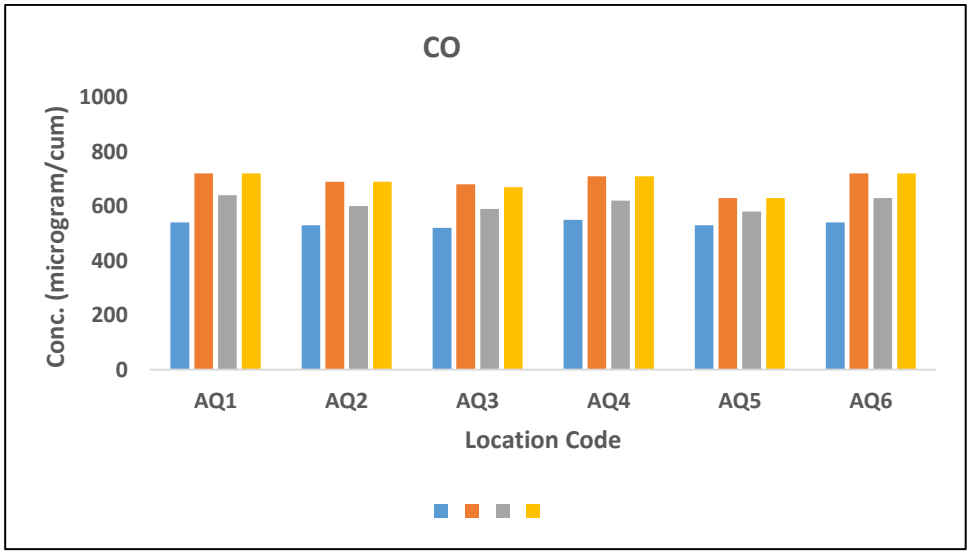


Figure 72: CO Monitoring results

Quarter 4 (June 22 to Aug 22)

Location Code		AQ1	AQ2	AQ3	AQ4	AQ5	AQ6
$PM_{10}(\mu g/m^3)$	Min	83.48	83.19	82.84	83.22	81.45	83.15
	Max	91.64	92.79	92.29	92.79	90.62	91.24
	Avg	87.08	87.25	86.85	87.10	86.55	86.99
	98 %tile	91.45	92.15	91.91	91.70	90.47	90.95
$PM_{2.5}(\mu g/m^3)$	Min	43.46	43.31	42.48	43.46	41.58	43.43
	Max	51.76	52.22	52.49	52.65	50.63	51.59
	Avg	47.03	47.34	46.89	47.07	46.52	46.92
	98 %tile	51.48	51.88	51.87	51.63	50.57	51.15
$SO_2(\mu g/m^3)$	Min	8.85	8.85	8.87	8.97	8.58	8.69
	Max	14.21	14.20	14.52	14.20	14.12	14.18
	Avg	12.16	11.52	11.52	11.99	11.32	11.94
	98 %tile	14.14	14.03	14.22	14.16	14.05	14.16
NO_2 ($\mu g/m^3$)	Min	18.59	18.39	18.64	18.67	18.58	18.66
	Max	24.21	24.84	24.30	24.35	24.33	24.27
	Avg	22.21	21.53	21.46	21.92	21.27	21.93
	98 %tile	24.20	24.34	23.99	24.32	24.23	24.23
CO (mg/m^3)	Min	0.52	0.51	0.52	0.52	0.53	0.55
	Max	0.69	0.67	0.67	0.69	0.66	0.70
	Avg	0.61	0.60	0.60	0.61	0.59	0.62
	98 %tile	0.68	0.66	0.67	0.68	0.65	0.70

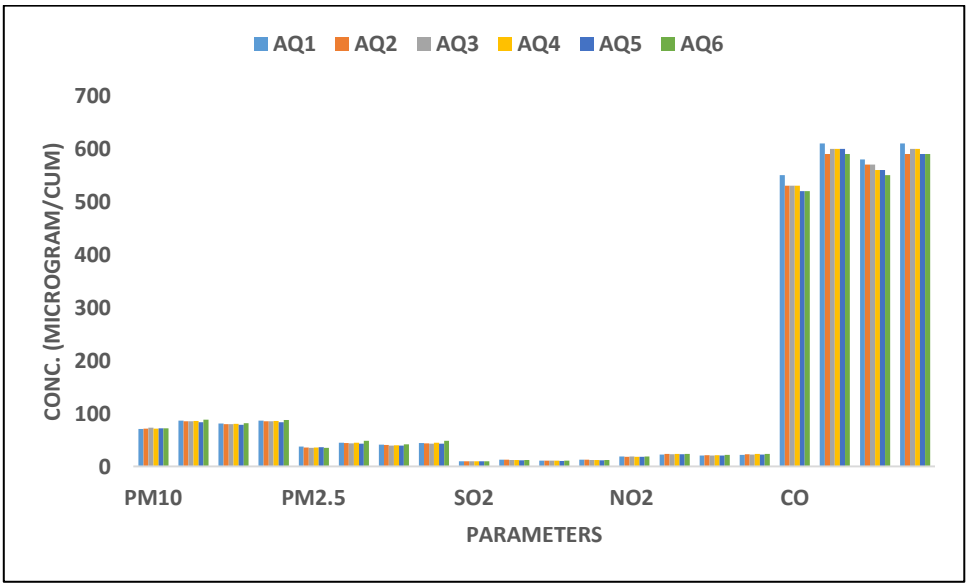


Figure 73: Baseline results at monitoring stations

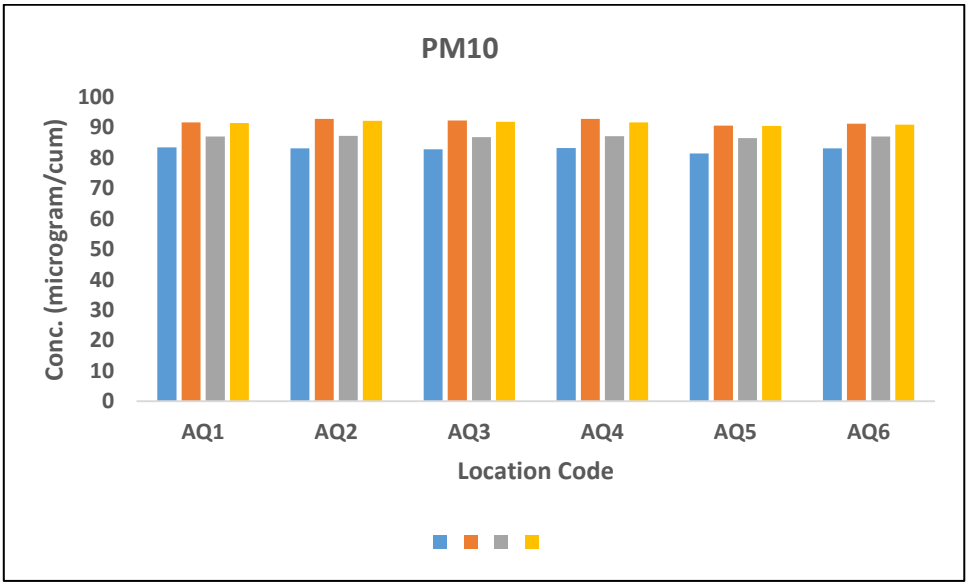


Figure 74: PM10 Monitoring results

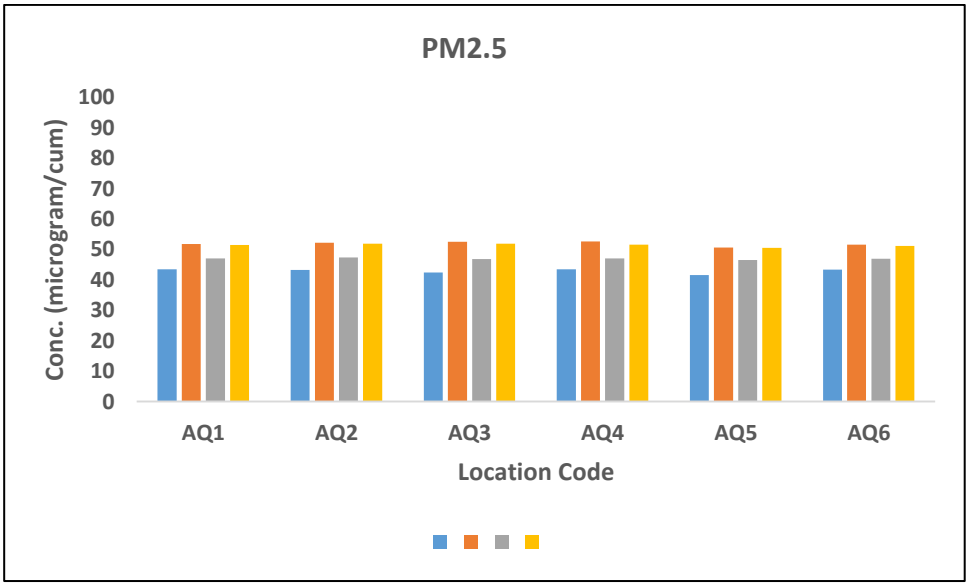


Figure 75: PM2.5 Monitoring results

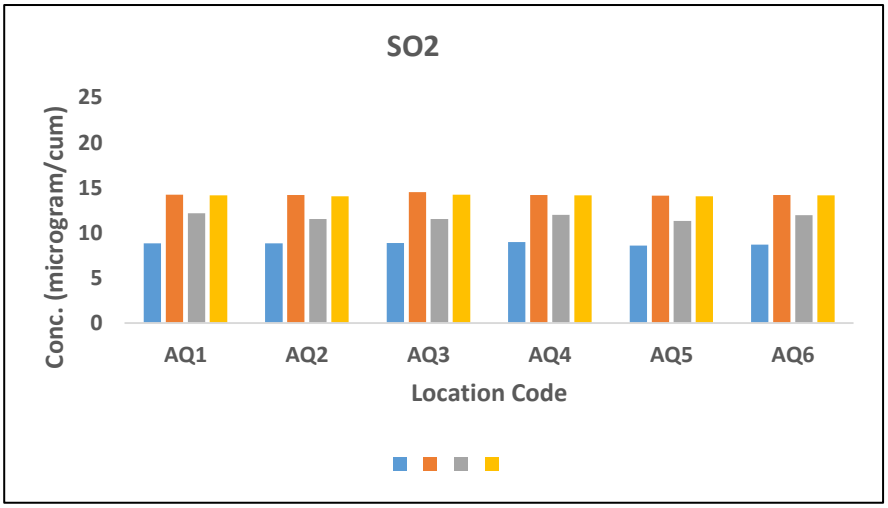


Figure 76: SO2 Monitoring results

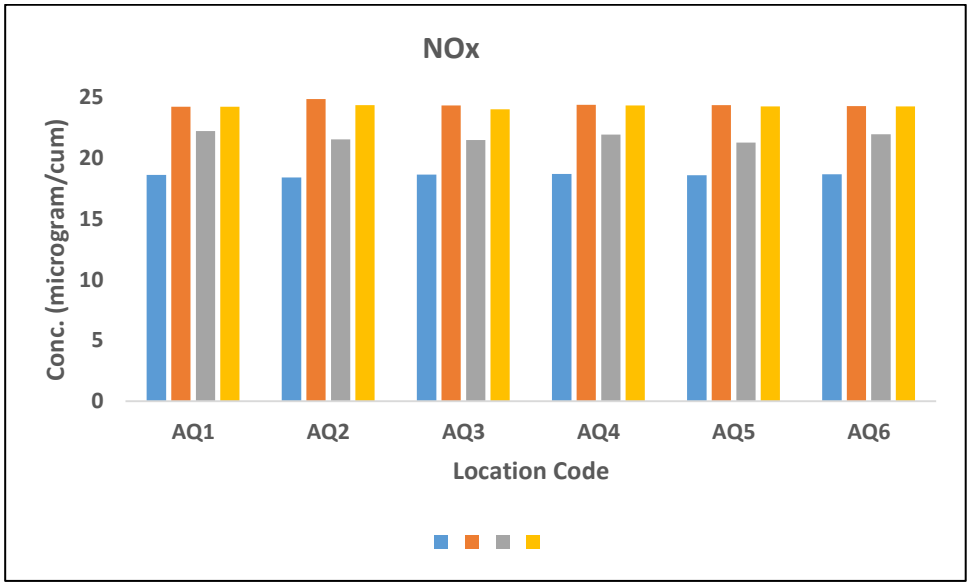


Figure 77: NOx Monitoring results

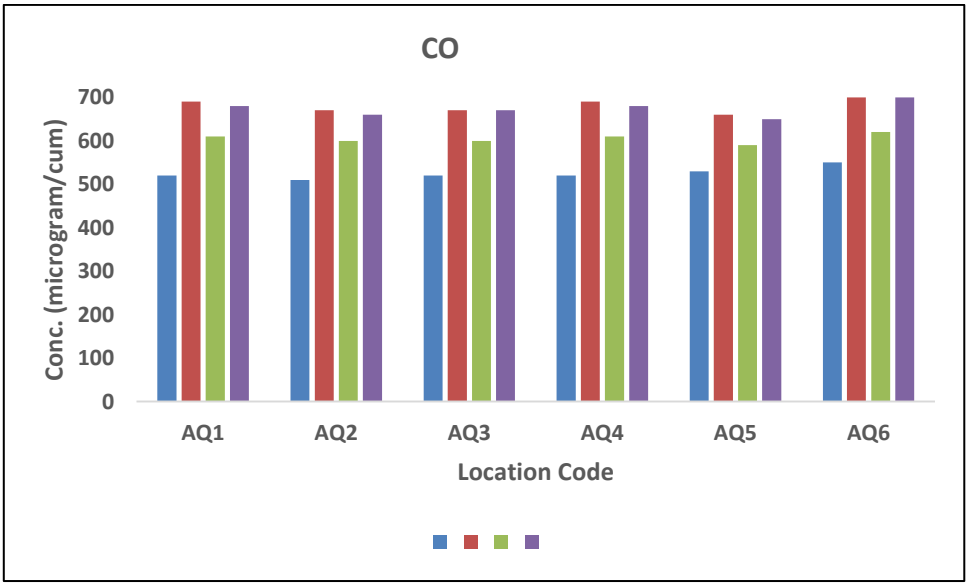


Figure 78: CO Monitoring results

Comparative Baseline Details

Parameters	Location code		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Average	Baseline
$PM_{10}(\mu g/m^3)$	**AAQ1**	Min	71.03	86.07	84.35	83.48	78.78-90.30	77.71-111
		Max	86.55	95.44	92.90	91.64		
		Avg	81.09	89.91	87.74	87.08		
		98 %tile	86.47	95.41	92.73	91.45		
	AAQ2	Min	71.58	83.30	81.43	83.19		
		Max	85.39	88.65	89.79	92.79		
		Avg	80.01	85.95	85.50	87.25		
		98 %tile	85.31	88.45	89.25	92.15		
	AAQ3	Min	73.49	79.73	81.16	82.84		
		Max	85.22	89.96	91.77	92.29		

Parameters	Location code		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Average	Baseline
		Avg	79.62	84.51	85.46	86.85		
		98 %tile	85.08	89.57	90.92	91.91		
	AAQ4	Min	71.65	81.33	80.59	83.22		
		Max	85.88	90.11	92.06	92.79		
		Avg	80.21	86.32	86.23	87.10		
		98 %tile	85.71	89.51	91.40	91.70		
	AAQ5	Min	71.92	81.05	81.43	81.45		
		Max	83.57	85.58	90.30	90.62		
		Avg	78.78	83.49	85.46	86.55		
		98 %tile	83.54	85.49	89.62	90.47		
	AAQ6	Min	72.19	85.27	82.11	83.15		
		Max	88.40	97.14	96.67	91.24		
		Avg	81.87	90.30	88.16	86.99		
		98 %tile	87.88	96.38	95.45	90.95		
$PM_{2.5}$($\mu g/m^3$)	**AAQ1**	Min	37.55	44.75	44.07	43.46	39.28-50.02	34.96-48.00
		Max	44.72	57.09	52.44	51.76		
		Avg	41.15	49.66	47.69	47.03		
		98 %tile	44.25	56.34	52.30	51.48		
	AAQ2	Min	35.51	43.18	41.46	43.31		
		Max	44.23	47.82	49.17	52.22		
		Avg	40.77	45.24	45.64	47.34		
		98 %tile	43.79	47.63	49.03	51.88		
	AAQ3	Min	35.29	38.08	41.65	42.48		
		Max	43.82	48.90	51.36	52.49		
		Avg	39.59	43.22	45.49	46.89		
		98 %tile	43.26	48.76	50.65	51.87		
	AAQ4	Min	35.64	42.08	40.51	43.46		
		Max	44.69	47.89	52.30	52.65		
		Avg	40.26	45.25	46.05	47.07		
		98 %tile	44.66	47.47	51.58	51.63		
	AAQ5	Min	36.11	41.12	41.36	41.58		
		Max	42.79	45.56	50.31	50.63		
		Avg	39.28	43.52	45.32	46.52		
		98 %tile	42.73	45.51	49.42	50.57		
	AAQ6	Min	35.06	45.03	41.69	43.43		
		Max	48.41	55.66	56.97	51.59		
		Avg	41.62	50.02	48.16	46.92		
		98 %tile	48.25	55.14	55.62	51.15		

Parameters	Location code		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Average	Baseline
$SO_2(\mu g/m^3)$	**AAQ1**	Min	9.67	12.50	10.85	8.85	10.64-13.76	5.87-9.90
		Max	12.52	16.05	14.23	14.21		
		Avg	11.02	13.76	12.88	12.16		
		98 %tile	12.51	15.62	14.18	14.14		
	AAQ2	Min	9.76	11.33	9.88	8.85		
		Max	12.71	13.18	13.62	14.20		
		Avg	11.13	12.17	11.55	11.52		
		98 %tile	12.50	13.17	13.40	14.03		
	AAQ3	Min	9.62	9.77	9.79	8.87		
		Max	12.31	13.62	14.38	14.52		
		Avg	10.84	11.76	12.34	11.52		
		98 %tile	12.29	13.53	14.32	14.22		
	AAQ4	Min	9.60	11.21	10.91	8.97		
		Max	12.31	13.61	14.07	14.20		
		Avg	10.98	12.55	12.33	11.99		
		98 %tile	12.24	13.53	13.99	14.16		
	AAQ5	Min	9.60	10.06	9.67	8.58		
		Max	11.84	12.42	14.57	14.12		
		Avg	10.64	11.20	11.99	11.32		
		98 %tile	11.79	12.34	14.37	14.05		
	AAQ6	Min	9.68	10.35	10.68	8.69		
		Max	12.47	14.43	14.51	14.18		
		Avg	10.91	12.38	12.70	11.94		
		98 %tile	12.36	14.32	14.45	14.16		
NOx ($\mu g/m^3$)	**AAQ1**	Min	18.79	22.34	20.83	18.59	20.65-24.21	19.69-26.72
		Max	22.22	25.34	25.47	24.21		
		Avg	20.88	23.95	22.95	22.21		
		98 %tile	22.09	25.27	25.12	24.20		
	AAQ2	Min	18.39	20.02	18.82	18.39		
		Max	23.51	23.66	24.54	24.84		
		Avg	21.28	22.32	21.73	21.53		
		98 %tile	23.06	23.61	24.09	24.34		
	AAQ3	Min	18.54	18.56	19.56	18.64		
		Max	22.85	25.16	25.06	24.30		
		Avg	20.87	22.11	22.25	21.46		
		98 %tile	22.60	24.58	24.82	23.99		
	AAQ4	Min	18.26	22.48	20.45	18.67		
		Max	23.85	25.69	25.37	24.35		
		Avg	20.97	24.21	23.22	21.92		
		98	23.64	25.56	25.34	24.32		

Parameters	Location code		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual Average	Baseline
		%tile						
	AAQ5	Min	18.37	20.64	19.82	18.58		
		Max	22.87	24.54	25.49	24.33		
		Avg	20.65	22.34	22.15	21.27		
		98 %tile	22.68	24.43	25.09	24.23		
	AAQ6	Min	18.55	22.17	20.67	18.66		
		Max	23.88	26.29	25.47	24.27		
		Avg	21.57	23.95	22.96	21.93		
		98 %tile	23.64	26.04	25.43	24.23		
CO (mg/m^3)	**AAQ1**	Min	0.55	0.55	0.54	0.52	0.55-0.64	0.26-0.52
		Max	0.61	0.71	0.72	0.69		
		Avg	0.58	0.64	0.64	0.61		
		98 %tile	0.61	0.71	0.72	0.68		
	AAQ2	Min	0.53	0.54	0.53	0.51		
		Max	0.59	0.67	0.69	0.67		
		Avg	0.57	0.60	0.60	0.60		
		98 %tile	0.59	0.67	0.69	0.66		
	AAQ3	Min	0.53	0.53	0.52	0.52		
		Max	0.60	0.67	0.68	0.67		
		Avg	0.57	0.58	0.59	0.60		
		98 %tile	0.60	0.66	0.67	0.67		
	AAQ4	Min	0.53	0.55	0.55	0.52		
		Max	0.60	0.74	0.71	0.69		
		Avg	0.56	0.63	0.62	0.61		
		98 %tile	0.60	0.72	0.71	0.68		
	AAQ5	Min	0.52	0.53	0.53	0.53		
		Max	0.60	0.61	0.63	0.66		
		Avg	0.56	0.57	0.58	0.59		
		98 %tile	0.59	0.61	0.63	0.65		
	AAQ6	Min	0.52	0.55	0.54	0.55		
		Max	0.59	0.71	0.72	0.70		
		Avg	0.55	0.64	0.63	0.62		
		98 %tile	0.59	0.71	0.72	0.70		

Observation:

The results indicate that Air quality parameters of PM10, PM2.5, SO2, NOx and CO average values for all locations were found comparable with Baseline and the maximum value was observed within prescribed standards at all the locations.

The comparative average values of all the parameters for the baseline (One season) of EIA/EMP period and annual of this CEIA period are presented in following table:

Parameters	Annual (CEIA Period)	Baseline (EIA/EMP Period)	NAAQs Prescribed Standard
$PM_{10}(\mu g/m^3)$	78.78-90.30	77.71-111	100
$PM_{2.5}(\mu g/m^3)$	39.28-50.02	34.96-48.00	60
$SO_2(\mu g/m^3)$	10.64-13.76	5.87-9.90	80
NO_2 ($\mu g/m^3$)	20.65-24.21	19.69-26.72	80
CO (mg/m^3)	0.55-0.64	0.26-0.52	2.0

Although there has been increase in the average values from baseline period, the reason being construction activities and movement of transport vehicles during the construction. Since during construction, the Stone crushers, borrow pits and movement of vehicles for material transportation are involved, the increased concentration are result of above activities.

Therefore, during construction period, it is recommended to minimize the particulate matter emission by regular sprinkling of water. The details analysis results at all the locations were attached as **Annexure-II**.

4.6 Ambient Noise Quality

Noise in general is unwanted / undesired sound, which is composed of many frequency components of various loudness distributed over the audible frequency range. Various noise scales have been introduced to describe, in a single number, the response of an average human to a complex sound made up of various frequencies at different loudness levels. The most common and universally accepted scale is the A weighted Scale which is measured as dB(A). This is more suitable for the audible range of sound, 20 to 20,000 Hz. The scale has been designed to weigh various components of noise according to the response of a human ear. The impact of noise sources on surrounding community depends on:

- Characteristics of noise sources (instantaneous, intermittent or continuous in nature). It can be observed that steady noise is not as annoying as one, which is continuously varying in loudness
- The time of day at which noise occurs, for example high noise levels at night in residential areas are not acceptable because of sleep disturbance; and
- The location of the noise source, with respect to noise sensitive land use, which determines the loudness and period of exposure.

The environmental impact of noise can have several effects varying from Noise Induced Hearing Loss (NIHL) to annoyance depending on loudness of noise. The assessment of noise is carried out by considering various factors like potential damage to hearing, physiological responses, annoyance and general community responses.

It is possible to describe important features of noise for noise levels measured over 24 hours using statistical methods. These features of noise are the parameters used for describing the noise levels at a particular location. Standards for permissible noise levels at various zones are set based on these parameters. The notations used for various noise level parameters are described below.

- Leq - Equivalent sound pressure level - the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
- Leq (1 hr) - The equivalent noise level for a specific one - hour period.
- Leq (24 hr) – The equivalent noise level during a 24 hour period.
- Lday - The equivalent noise level from 6:00 hours to 22.00 hours.
- Lnight - The equivalent noise level from 22:00 hours to 6.00 hours.

Ldn - It is similar to a 24 hr equivalent noise level except that during night time (10 PM to 6 am) a 10 dB(A) weighting penalty is added to the instantaneous sound level before computing the 24 hr average. This nighttime penalty is added to account for the fact that noise during night when people usually sleep is judged as more annoying than the same noise during the daytime.

A noise monitoring survey was conducted at six representative locations based on the land use of the area with the objective of assessing baseline noise levels, which can be later used to assess the impact of the total noise generated by the proposed project activities. Noise level monitoring was carried out continuously for 24 - hours with one hour interval at each location using a Lutron sound level meter capable of measuring the Sound Pressure Level (SPL) in dB(A). Hourly Leq values were computed by the noise integrating sound level meter and statistical analysis was done for measured noise levels at six locations in the study area. The Leq day, and Leq night calculated for various locations are presented in **Table 38.** The values are compared with the standards prescribed by CPCB for various zones. Out of the six locations of noise monitoring, two locations are commercial, remaining locations represent densely populated, commercial and industrial area/zone.

The description of environmental settings of noise monitoring locations is given in Table below:

Table 38: Ambient Noise Level Monitoring Locations

Details of Ambient Air Quality Monitoring carried out at site	Location, Chainage
NQ-1	Chapiya Fish Farming Office at Narkatha (Start of Alignment-NH)
NQ-2	Akona Khurd, Ch 49+800
NQ-3	Chaudia Masan

Details of Ambient Air Quality Monitoring carried out at site	Location, Chainage
NQ-4	Daswat Pur Ethiya
NQ- 5	Mahadevpur
NQ-6	Mutkallipur (End of Alignment)







Figure 79: Ambient Noise Monitoring Sampling Photographs

Table 39: Ambient Noise Quality Monitoring Results

S. No	Location	Observed Value Leq dB(A) (Sept 21 to Nov 22)						Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*		Night*		Day/Night		Day*	Night*	
		Min	Max	Min	Max	Min	Max			
1	Chapiya Fish Farming Office at Narkatha (Start Of Alignmet - NH)	56.42	60.20	41.71	45.30	55.34	59.00	**65.0**	**55.0**	**Commercial**
2	Akona Khurd Ch-49+800	51.11	52.00	40.15	41.10	50.81	51.60	**55.0**	**45.0**	**Residential**
3	Chaudia Masan	50.30	51.00	37.04	38.30	49.70	50.30	**55.0**	**45.0**	**Residential**
4	Daswat Pur Ethiya	51.36	53.40	39.14	40.00	50.77	52.39	**55.0**	**45.0**	**Residential**
5	Mahadevpur	51.80	52.80	38.10	41.60	51.20	52.40	**55.0**	**45.0**	**Residential**
6	Mutkallipur (End Of Alignment)	61.54	62.60	41.76	47.23	60.24	61.40	**65.0**	**55.0**	**Commercial**
*Day Time		Leq (6.00AM TO 10.00 PM)								
*Night Time		Leq (10.00PM TO 6.00 AM)								

Observation:

The Noise quality result show Leq Day time noise level and Leq Night time noise level were found within prescribed standard prescribed by CPCB as per specified zones.

It is clear from the above table that noise levels are within the stipulated limits of respective land uses at all locations of noise level measurements, though noise mitigation measures have been proposed for sensitive receptors.

4.7 Biological Environment

4.7.1 Forests & Protected Areas

Study of Census, 2011 presents that Gorakhpur district is having the highest percentage of forest area among the project alignment districts. Details of Forest area in respect to total district area is given in **Table 40** below:

Table 40: District wise Forest Details

S. No	District	Total Geographical Area (ha)	Total Forest Area (ha)	
			Ha	Percentage
1	Azamgarh	469683.4	2697.2	0.57
2	Ambedkarnagar	234923.0	1460.0	0.62
3	Sant Kabir Nagar	164600.0	1400.0	0.85
3	Gorakhpur	353592.9	5128.6	1.45

Source: District Information Websites.

From the above table it is clearly evident that Gorakhpur is having the highest percentage of forest area among all the districts. In addition, as per the Government of Uttar Pradesh, most of the avenue plantation alongside of the highways and canals are notified as Protected Forest. On analysis of Topographical sheets issued by Survey of India no forest area was observed on the proposed alignment of the Gorakhpur Link Expressway Project.

Biological components are one of the most important constituents of our environment. They are the integral part of our life as they provide raw materials for livelihoods, trade, medicines and industrial development. Their conservation and sustainable use is very much essential in today's developmental process. Developmental processes are today's demand and cannot be stopped as such. It has been observed in past that most of our developmental process cost our environment. In order to keep them unaffected or minimum affected while our developmental activity, it is always necessary to know the background of the area from biological point of view. After getting such information we can estimate the impact on the environment by the proposed activities and mitigate them. Similar approach has been adopted for conducting the Biological Environment study for the proposed Project.

4.7.1.1 Methodology for Floral & Faunal Study

Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data

was collected from the Forest department and published relevant literatures to get the correct picture of the study area. Inventory of flora and fauna is prepared on the basis of collected data. Forest type and vegetation of the study area is discussed on the basis of plant species recorded from the area.

Flora of the Area

Thick plantations was observed along the water body and crossing road across and nearby the alignment. The main tree species in the study area are Sal, Piasal, Semul, Sisoo, Kurum, Kusum, Kasi, Gamar, Siris, Kendu, Asan, Karada, etc. While extensive growth of Daba bamboo (Bambusa arundinacea) have also been observed along water courses. The trees along the right of way of the proposed alignment are given in **Table 41.**

Common vegetables like Brinjal, Tomato, Potato, Chilli, Bean (Sem) Jhinga are cultivated in the study area and the areas along the bank of rivers. Among the commonly known fruits, Mango, Guwava, Jackfruit and Papaya were observed in abundance. Flora details were collected from secondary source and primary source. Plant spices observed along the water body and crossing road across and nearby the alignment through primary source and secondary sources is given in **Table 41.**

Table 41: List of Flora

S. No.	Botanical Name	CommonName	Family Name
	Trees		
1.	*Acacia nilotica (Willd). Syn. A. Nilotiea (L.) Wild.*	Babool	Fabaceae
2.	*Acacia catechu*	khair	Fabaceae
3.	*Adina cordifolia*	Haldu	Rubiaceae
4.	*Aegle marmelose*	Bael,	Rutaceas
5.	*Albizzia lebbek (Bensh)*	Kala Siras	Fabaceae
6.	*Azadirachta indica A. (Juss)*	Neem	Meliaceae
7.	*Bombax ceiba*	Semal	Bombacaceae
8.	*Butea monosperma (Lamk.) Taub.*	Dhak	Fabaceae
9.	*Dalbergia sissoo (Roxb)*	Shisham	Fabaceae
10.	*Ficus benghalensis*	Bargad	Moraceae
11.	*Ficus religiosa (Linn)*	Pipal	Moraceae
12.	*Flacourtia indica (Eurm.F) Merr.*	Kakar	Salicaceae
13.	*Pithecellobium dulce (Benth)*	Jalebi	Fabaceae
14.	*Shorea robusta*	Sal	
15.	*Syzigium cumini*	Jamun	
16.	*Terminalia tomentosaW. & A.*	Arjun	Combretaceae
17.	*Terminalia belerica*	behera	
18.	*Toona ciliata (Roen).*	Tun	Meliaceae
19.	*Zizyphus xylopyra (Retz.) Willd.*	Ghont	Rhamnaceae
	HERBS AND SHRUBS		
1.	*Achyranthes aspera.*	Chirchita	Amaranthaceae
2.	*Berberis spp.*	Kinjora	Berberidaceae
3.	*Calotropis procera R.Br.*	Aak	Apocynaceae

4.	*Capparis deciduas (Forsk) Edgw.*	Kareel	Brassicaceae
5.	*Cassia alata (Linn).*	Dadmari	Fabaceae
6.	*Cassia occidentalis (Linn).*	Chakunda	Fabaceae
7.	*Clerodendron viscosum (Vent)*	Bhat	Verbenaceae
8.	*Lantana camara (Linn)*	Kuri	Verbenaceae
9.	*Ocimum sanctum (Linn)*	Tulasi	Lamiaceae
10.	*Smilax prolifera*	Ramdaton	Liliaceae
11.	*Zizyphus nummularia (Surm.f.)W.& A.*	Kharbair	Rhamnaceae
CLIMBERS			
1.	*Asparagus racemosus (Willd)*	Satawar	Asparagaceae
2.	*Caesalpinia decapetala*	Alai	Fabaceae
3.	*Coccinea indica W. & A.*	Kundaru	Rubiaceae
4.	*Combretum decandrum (Roxb)*	Kali bel	Combretaceae
5.	*Cryptostegia grandiflora (Roxb.) R.Br.*	Chabuk chari	Apocynaceae
6.	*Cymbopogon martini (Roxb.)*	Mahur	Poaceae
7.	*Phragmites karka (Trin).ex.*	Beensa	Poaceae
8.	*Smilax prolifera (Roxb)*	Ramdatun	Smilacaceae
9.	*Vitis repanda W. & A*	Pani bel	Vitaceae
10.	*Zizyhpus oeonoplia (Mill).*	Makoha	Rhamnaceae
GRASSES			
1.	*Cenchrus ciliaris (Linn).*	Anjan	Poaceae
2.	*Chry sopogon fulvus*	Kush	Poaceae
3.	*Cymbopogon martini (Roxb)*	Saidar	Poaceae
4.	*Cynodon dactylon (Linn.) Perp.*	Dub	Poaceae
5.	*Desmostachya bipinnata (Stapf).*	Dab	Poaceae
6.	*Imperata cylindrica (Linn)P.Beauv*	Siru	Poaceae
7.	*Saccharum munja (Roxb) Jesweit.*	Mung	Poaceae
8.	*Saccharum spontaneum (Linn)*	Kansa	Poaceae
9.	*Sehima nervosum (Rotti) Stapf.*	Sain/Seta	Poaceae
10.	*Setaria glauca (Linn.) P. Beauv.*	Vindra	Poaceae
11.	*Sporbolus marginatus (Hochst). ex. A. Rich.*	Usari	Poaceae
12.	*Vetiveria zizanioides (Linn) Nash*	Khas	Poaceae
BAMBOO			
1.	*Dendrocalamus strictus (Roxb)*	Bans	Poaceae
2.	*Bambusa arundinacea (Willd)*	Burma	Poaceae
PARASITES			
1.	*Cuscuta reflexa*	Akash bel	Convulvaceae

Fauna of the Area

During the faunal survey in the area no wildlife corridor or movement of animals was recorded from proposed project area. No established habitats of any mammals or birds are noticed in river bed and along the banks. No bird's habitats like nesting, breeding and forging patterns are noticed in the core zone. Local birds are noticed crossing over the banks in search of food. No fixed pattern in migratory behavior is noticed.

The fish species which are commonly found in the river of the proposed site are Labio bata (Bhangan or Bata), Gudusia chapara (Chappera or Palla), Labio rohita (Dumra or Dhambra), Notopterus notopterus (Pari or Battu), Catla catla (Theila), etc.

Amphibians are commonly found at the places along the margin of aquatic and terrestrial systems. Some of the commonly reported species are Bufo melanostictus (common Indian tod), Euphlyctis cyanophlyctis (Indian skipper frog), Hoplobatrachus tigerinus (Indian bull frog), etc.

Many domesticated mammal species are reported from buffer zone during the field survey. Common domestic animals like Buffalo, cow, goat etc. can be noticed in open grass fields while grazing. Small mammals like Indian palm squirrel (Funambulus palmarum) and field mouse (Apodemus sylvaticus) are noticed in vicinity of the village. Inquiry from village people regarding wild animals reveals that monkey (Macaca mulata), Indian hare (Lepus nigricollis), fruits bat (Pteropus conspicillatus), mongoose (Herpestes edwardsii), jackal (Canis aureus), etc. are often seen in the area.

The bird population consists of Common teal (Anas crecca), White throated kingfisher (Halcyon smyrnensis), Pied kingfisher (Ceryle rudis), Red wattled lapwing etc are noticed. House crow (Corvus splendens), House sparrow (Passer domesticus), Common hill Myna (Gracula religiosa), Red- rumped Swallow (Cecropis daurica), Hoopoe (Upupa epops ceylonensis) are of common occurrence. The reptilian's species commonly reported are Garden lizard (Calotes versicolor) and Eutropis macularia along shady places in agricultural field or where growth of bushes is noticed. Among non-poisonous snakes rat snakes (Ptyas mucosus) are commonly noticed in field, followed by poisonous snakes like Cobra (Naja naja) and Banded krait (Bungarus multicinctus) are occasionally encounter by the farmers. The details of Fauna in the study area were presented in **Table 42.**

Table 42: List of Fauna

S. No.	Scientific name	Common name	Schedule
MAMMALS			
1.	*Funambulus pennati*	Striped Squirrel	IV
2.	*Bandicota bengalensis*	Indian Mole-rat	V
3.	*Rattus rattus*	House Rat	V
4.	*Mus musculus*	House Mouse	V
5.	*Lepus nigricollis*	Indian Hare	IV
6.	*Macaca mulatta*	Rhesus	II
7.	*Presbytis entellus*	Common Langoor	II
BIRDS			
8.	*Eudynamys scolopacea*	Koel	IV
9.	*Francolinus francolinus*	Black Partridge	IV
10.	*Gallus gallus*	Red Jungle Fowl	IV
11.	*Coturnix coromandelica*	Rain Quail	IV

S. No.	Scientific name	Common name	Schedule
12.	*Coturnix coturnix*	Common Quail	IV
13.	*Streptopelia decaocta*	Ring Dove	IV
14.	*Psittacula krameri*	Rose ringed Parakeet	IV
15.	*Strix aluco*	Tony Wood Owl	IV
16.	*Glaucidium brodiei*	Pygmy Owlet	IV
17.	*Ceryle lugubris*	Kingfisher	IV
18.	*Upupa epopa*	Hoopoe	IV
19.	*Megalaima zeylanica*	Green Barbet	IV
20.	*Hirundo rustica*	Common Swallow	IV
21.	*Acridotheres tristis*	Indian Myna	IV
22.	*Corvus splendens*	House Crow	V
23.	*Hypsipetes madagascariensis*	Black Bulbul	IV
24.	*Monticola cinclorhynchus*	Blue headed Rock Thrush	IV
25.	*Pomatorhinus erythrogenys*	Rusty cheeked Babbler	IV
26.	*Passer domesticus*	House Sparrow	IV
27.	*Estrilda formosa*	Green Munia	IV
28.	*Lonchura striata*	White Backed Munia	IV
29.	*Lonchura malabarica*	White Throated Munia	IV
30.	*Ploceus benghalensis*	Black-breasted Weaver Bird	IV
31.	*Ploceus manyar*	Streaked Weaver Bird	IV
32.	*Phalacrocorax niger*	Little Cormorant	IV
33.	*Anser anser*	Greylag goose	IV
34.	*Ardea alba*	Large Egret	IV
35.	*Porphyrio porphyrio*	Purple Murhan	IV
Reptiles			
36.	*Hemidactylus sp.*	House lizard	IV
37.	*Calotes versicolor*	Common garden lizard	IV
38.	*Naja naja*	Indian cobra	II
39.	*Bungarus caerulens*	Indian Krait	II
40.	*Ptyas mucosus*	Rat snake	II
Amphibians			
41.	*Bufo melanostictus*	Common Toad	IV
42.	*Rana tigrina*	India bull frog	IV
43.	*Polypedates maculates*	India tree frog	IV
44.	*Bufo stomaticus*	Skipping frog	IV
Fishes			
1.	*Mastacembelus (Lacep.)*	Baiyan	
2.	*Garra gotyla (Gray.)*	Bhangera/Gotyala	
3.	*Notopterus notopterus*	Battu	
4.	*Catla catla*	Theila	
5.	*N.rupicola inglishi*	Gadera/Gunther	

S. No.	Scientific name	Common name	Schedule
6.	*N.botia (Ham.)*	Gadera/Gunther	
7.	*Lepidocephalichthys guntea (Ham.)*	Gadera/Gunther	
8.	*Hilsa hilsa*	Hilsa	
9.	*Barbus tor tor (Ham.)*	Mahaseer	
10.	*Cirrhinus mrigala*	Mrigal	
11.	*Labeo rohita*	Rohu	

4.8 Socio-economic Environment

4.8.1 Population & Work Force

The proposed corridor has been named after the town of Gorakhpur which is an important town in Uttar Pradesh with significant interactions with Nepal and the rest of the state. Gorakhpur has a population size of nearly 4,555,696.

As per 2011 census, of the total population of 4,555,696 out of which 51% constitute males and 48.1% constitutes females, whereas Azamgarh has a population of 4,613,913 out of which males and females share equal strength and Ambedkar Nagar has population of 2,397,888 of which males constitute 51.5% and female constitute 48.5%. Total population of Sant Kabir Nagar is 1,714,300, of which 51% constitute male and 49% constitute female population.

Literacy rate of the four districts are of 83%, higher than the national average of 59.5. The literacy rate of Gorakhpur is 70.83 % and that of Sant Kabir Nagar, Azamgarh and Ambedkar Nagar are 69 %, 70.93 % and 72.23 % respectively. Population density is of 1337, 1041, 1138 and 1020 for Gorakhpur, Sant Kabir Nagar, Azamgarh and Ambedkar Nagar.

Table 43: Area Profile of Gorakhpur

Sl.No	Village name	Population (Appx)					Literacy rate	
		Total	Male	Female	% Male	% Female	% Male	% Female
1	Chapiya	1,507	775	732	51	49	78.48	54.99
2	Narkatha	135	69	66	51	49	67.74	42.59
3	Bhagwanpura	667	326	341	49	51	86.47	53.26
5	Gonda	4,786	2,576	2,210	54	46	78.23	51.91
6	Dadhauna	93	48	45	52	48	93.02	73.81
7	Sohra	11,474	6,149	5,325	53	47	73.46	46.49
8	Choriya	2,629	1,275	1,354	48	52	79.04	54.58
9	Barukagarh	472	236	236	50	50	74.21	50.27
10	Semriya	1,405	709	696	50	50	92.69	65.20
11	Gajar Bansman	643	320	323	49	51	83.14	58.54
12	Padiyapar	2,074	1,044	1,030	50	50	77.49	56.32
13	Harnahi	1,883	1,003	880	53	47	88	53
14	Gajar Jagdish	373	180	193	48	52	83	71
15	Sonari Sanker	471	232	239	49	51	85.17	60.56
16	Unaula	1,075	568	507	53	47	86.01	64.86
17	Gerana	1,322	630	692	48	52	84.88	57.39
18	Jigna Tiwari	2,344	1,284	1,060	55	45	94	70

Sl.No	Village name	Population (Appx)					Literacy rate	
		Total	Male	Female	% Male	% Female	% Male	% Female
19	Kol	914	472	442	52	48	68.93	49.87
20	Dadora	1,482	784	698	53	47	94.15	73.55
21	Nagva	1,335	718	617	54	46	61.26	40.26
22	Bagau	1223	708	515	58	42	71	59
23	Teliabhar	4494	2,220	2274	49	51	83.80	59.81
24	Bhadar Khas	2,896	1,466	1,430	51	49	85.12	67.35
25	kastdevar	87595	466,35	40960	53	47	75.83	53.22
26	Usrain	832	402	430	48	52	86.11	63.16
27	Barihari	8,024	4,212	3,812	52	48	62.42	52.83
28	Masi	1,570	717	853	46	54	96.26	81.97
29	Narayanpur	7,794	3,917	3,877	50	50	86.02	68.64
30	Badepurva	4,768	2,364	2,404	50	50	91.15	76.63
31	Aaahiroli bujurg	749	353	396	47	53	85.67	67.16
32	Haredand bujurg	10	3	7	30	70	50	50
33	Haredand Khurd	10	3	7	30	70	50	50
34	Dhannujot	21	15	6	71	29	61.54	100.00
35	Aaraji Haredand Bujurg	10	3	7	30	70	50	50
36	Lalmanpur	425	216	209	51	49	74.72	50.30
37	Malanv	1,754	889	865	51	49	85.04	57.41
38	Dhaboli	2,118	1,033	1,085	49	51	94.74	86.33
39	Alavalpur	2,486	1,338	1,148	54	46	85.49	58.18
40	Bhisiya Bujurg	236	127	109	54	46	82	52
41	Barparva babu	979	501	478	51	49	65	42
42	Trilokpur	945	482	463	51	49	61.33	36.59
43	Jhinkhini	355	175	180	49	51	71.53	48.73
44	Samwapur	1117	593	524	53	47	57.16	34.78
45	Belghat Turkwalia	1,498	789	709	53	47	72	48
46	Bahadurpur Khurd	1,040	569	471	55	45	73.54	43.88
47	Bahadurpur Bujurg	2,217	1,126	1,091	51	49	78.90	56.64
48	Kathababu	674	341	333	50	50	79.07	58.11
49	Ekona Bujurg	1104	593	511	54	46	79.76	55.95
50	Sarya Tiwari	3,657	1,921	1,736	52	48	82.21	65.23

Source: District Information Websites

Table 44: Area Profile of Ambedkar Nagar

Sl No	Village name	Population					Literacy rate	
		Total	Male	Female	% Male	% Female	%Male	%Female
1	Dadva	2,075	1,034	1,041	49	51	84.28	67.02
2	Kalupur	10,413	5,390	5,023	52	48	90.06	81.07
3	Maharampur	2,601	1,206	1,395	46	54	93.20	78.65
4	Pulwariya	6,386	3,395	2,991	53	47	71.16	50.92
5	semra Tappa Havali	646	346	300	53	47		31.3
6	Ahirolirani mau	2,221	1,131	1,090	51	49	88.44	66.04
7	Sikrora	1,214	632	582	52	48	91.01	57.11
8	Tenuai Kalan	1,730	913	817	52	48	85.11	69.06
9	Karundi Mishra	957	471	486	49	51	86.71	66.51
10	Bhoipur	1,688	888	800	52	48	83.94	59.56
11	Jamin Nandana	741	355	386	52	48	88.54	59.83
12	Bhodi Patti	406	201	205	49	51	88.14	46.82
13	Maniyarpur	3,593	1,846	1,747	51	49	78.03	60.20
14	Achilipur	3,030	1,542	1,488	51	49	78.33	58.43
15	Ganpatpur	737	353	384	48	52	84.14	67.25
16	Pulwariya	3677	1,921	1756	53	47	83.78	66.69
17	Noorpur Kalan	933	473	460	51	49	80.75	58.94
18	Barahkhurd	2,433	1,254	1,179	51	49	80.11	61.35
19	Ajmalpur	4,161	2,141	2,020	51	49	71.23	54.24
20	Khanpur Hussainabad	6	2	4	33	67	0.00	66.67
21	Parvatpur	3,304	1,650	1,654	50	50	85.73	61.87
22	Masoda	4,023	2,084	1,939	52	48	89.31	68.44
23	Dulhupur	3,807	1,921	1,886	50	50	82.47	61.19
24	Nathupur	41	13	28	32	68	75.00	47.06
25	Mahgipur	125	60	65	48	52	88.46	55.36
26	Muskarai	5269	2721	2548	52	48	27.50	38
27	Shahpur	172	88	84	51	49	96.05	76.06
28	Shevpal	2,709	1,350	1,359	49	51	83.08	60.61
29	Sehri	2,470	1,163	1,307	47	53	78.83	60.39
30	Mohammadpur Adarpur	11,967	6,368	5,599	53	47	68.96	50.43

Source: District Information Websites

Table 45: Area Profile of Azamgarh

S.No	Village name	Population					Literacy rate	
		Total	Male	Female	% Male	% Female	%Male	%Female
1	Akbelpur Mt Gorharpur	72,049	40,633	31,416	56	44	81.69	66.87
2	Kukripur	250	127	123	50	50	88.68	68.93
3	Borajpur Kalan	1,328	677	651	51	49	86.70	63.14
4	Shekpura	890	483	407	54	46	84.21	61.30
5	Katohi	1,076	524	552	48	52	82.49	60.43
6	Etori Khalishpur	2,058	1,066	992	51	49	85.01	64.17
7	Mandohi	2,199	1,127	1,072	51	49	80.47	60.45
8	Dahiya Bujurg	2,538	1,325	1,213	52	48	88	71
9	Chandrabha n pur	1,001	462	539	46	54	76.33	57.75
10	Khiradi	2036	1058	978	52	48	74	56
11	Banwaripatt i	2,004	1,056	948	52	48	50.95	31.95
12	Jogipur	393	209	184	53	47	80.79	51.59
13	Paranpur	1,650	758	892	45	55	75.39	53.82
14	Chakiya	826	430	396	52	48	92.14	68.22
15	Salarpur	452	232	220	51	49	89.34	79.14

Source: District Information Websites

Table 46: Area Profile of Sant Kabir Nagar

Area Profile for Sant Kabir Nagar(as per Census 2011)								
Sl.No	Village name	Population					Literacy rate	
		Total	Male	Female	% Male	% Female	%Male	%Female
1	Kharagpur	1,165	603	562	52	48	62.50	34.04
2	Gunwatia	146	74	72	51	49	79.71	52.38
3	Dhol baja	96	53	43	55	45	68.18	35.29
4	Chakdaha	227	123	104	54	46	67.65	37.93
5	Suwarha	1	1	0	100	0	0.00	0.00
6	Bhauwapar	414	219	195	53	47	81.77	64.74

Source: District Information Websites

4.8.2 Identification of First Aid and Trauma Centre

5-6 nos. of first aid center at camp offices located in Mandohi, Chakiya and Mahangipur etc. villages have been established. The trauma centers are in existence at Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar, Azamgarh falling along proposed expressway. The patients will be referred to these trauma centers and transported in ambulance from project sites.

Trauma center with refreshment center onsite are proposed along the expressway.

4.9 Agriculture

Due to the presence of Rivers, the districts have developed into an agrarian economy. The land of the River basin with its fertile alluvial soil. Major portion of the project alignment is passing through agricultural land (72%). Main crops found along the side of the project road include wheat, sugarcane, millet, kharif, rabi, rice, etc.

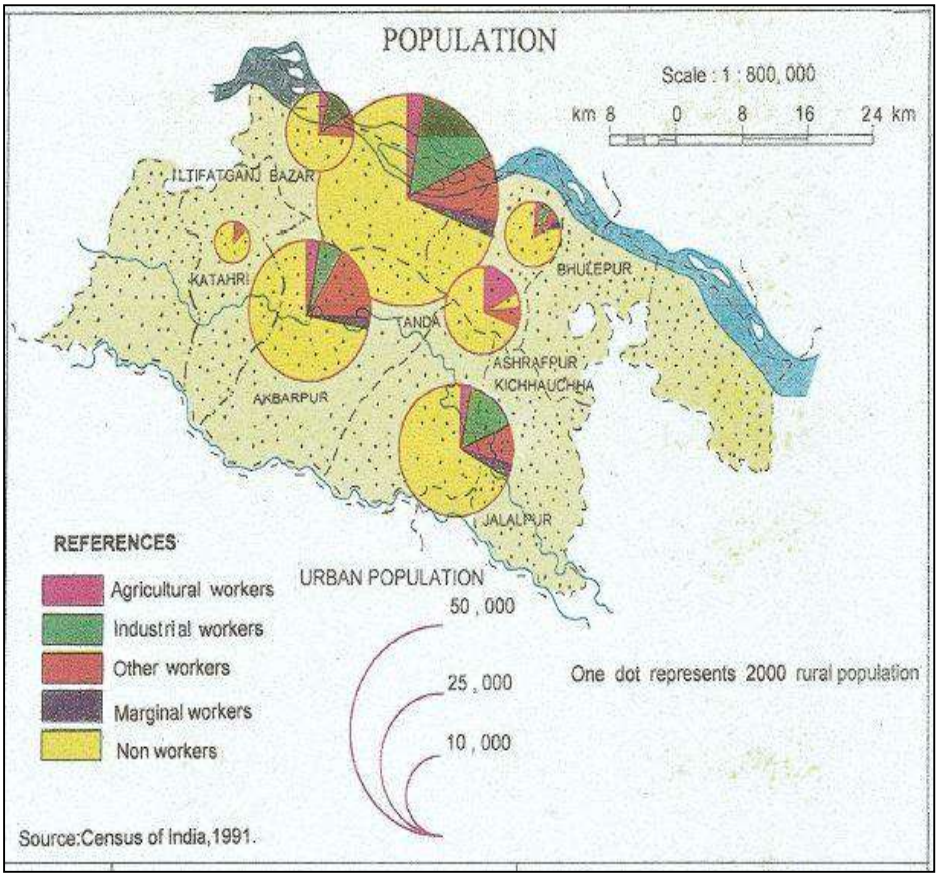


Figure 80: Map of the Ambedkar Nagar District Showing Population

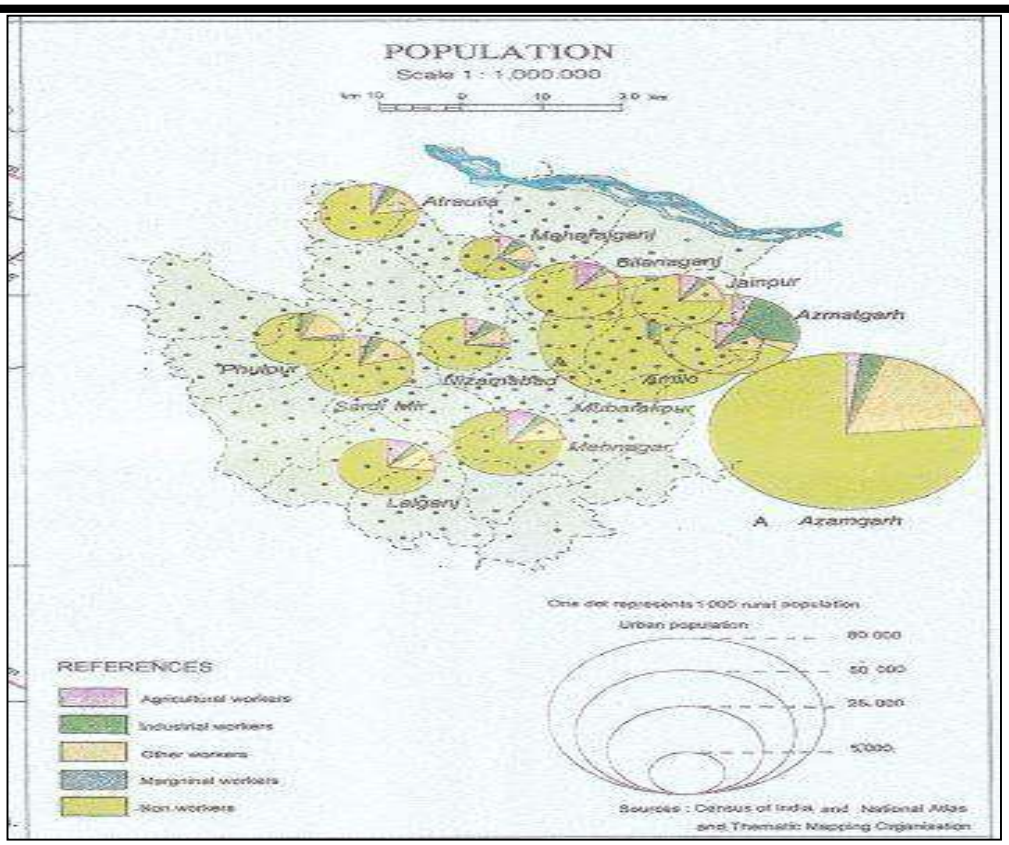


Figure 81: Map of the Azamgarh District Showing Population

4.10 Industries

Not many industries are present along the proposed Expressway. Few manufacturing industries are present. Table below provides the chainage wise list of industries along the alignment.

Table 47: Kilometer wise List of Industries present along the Project Road

Sl. No.	Chainage		Type of Business Amenities.	Name of Business Amenities.	Appx. Position with respect to CL
	From	to			
1	0+000	0+000	Steel Industries	Manish Steel Industries	7.15Km towards LHS
2	0+000	0+000	Corporate industry	Murali Manohar Industries	7.10Km towards LHS
3	56+560	56+560	Cosmetics industry	Papu Sign Tambaco Factory	8.88Km towards RHS
4	55+940	55+940	PVC industry	Rahul Press PVC industry	7.30Km towards RHS

Source: Reconnaissance survey.

4.11 Industries

The important towns / villages / places along the project stretch are presented in **Table 48**.

Table 48: Towns and Villages along the Project Road

District	Tehsil	Villages
Gorakhpur		Chapiya,Narkatha,Bhagwanpura,Majhava,Bhagwanpura,Gonda, Dadhauna, Kathota, Sohra, Choriya, Vishnathpur, Barukagarh, Sarya Tiwari, Dohariya Prannath, Dohariya Bargah, Semriya, Pahliapar,Gajar Bansman,

		Padiyapar, Harnahi, Sonari Sanker, Kharatee, Unaula, Gerana, Bheeku Bhaisa, Jigna Tiwari, Kol, Dadora, Nagva, Bagaur Trilokpur, Jhinkhini, Samwapur, Belghat, Turkwalia, Bahadurpur Khurd, Bahadurpur Bujurg, Bidhnapar, Dhuniapar, Kathababu, EkonaBujurg
Sant Kabir Nagar		Kharagpur, Gunwatia, Dhol baja, Chakdaha, Suwarha, Bhauwapar
Azamgarh	Bhura npur, Phoolpur	Akbelpur Mt Gorharpur, Kukripur, Borajpur Kalan, Shekpura, Katohi, Etori Khalishpur, Mandohi,Dahiya Bujurg, Chandrabhanpur, Khiradi,Banwaripatti,Dharampatti,Jogipur,Paranpur,Mukandapatti,Chakiya
Ambhedkar Nagar	Allapur, Jalalpur	Dadva, Kalupur, Maharampur, Pulwariya, semra, Tappa Havali, Ahirolirani mau, Sikrora, Tendua Jalal, Tenuai Kalan, Tanuai Khurd, Karundi Mishra, Jamin Goiji, Bhoipur, Majipur, Jamin Nandana, Nandana, Bhodi Patti, Maniyarpur, Achilipur, Ganpatpur, Pulwariya, Noorpur Kalan, Barahkhurd, Ajmalpur, Khanpur Hussainabad Khanpur, Hussainabad Parvatpur Parvatpur Masoda Masoda , Dulhupur,Nathupur,Mahgipur,Jamin Nandana,Nandana,Bhodi Patti, Maniyarpur, Achilipur, Achilipur,Pulwariya,Noorpur Kalan,Barahkhurd,Ajmalpur,Khanpur Hussainabad Khanpur Hussainabad Parvatpur Parvatpur Masoda Masoda Dulhupur,Nathupur,Mahgipur,Chodaprash,Muskarai,Shahpur,Shevpa, Sehri,Mohammadpur Adarpur, Sehri

Source: Reconnaissance survey

4.12 Cultural Resources

There are a number of other religious structures including temples and shrines present along the project road. Other than these religious structures, there are no archaeological or heritage sites found along the project corridor. All these features are socially very sensitive and needs critical care in preserving them during widening. List of cultural and religious structures present along project road are given in **Table 49**.

Table 49: Locations of Socially Sensitive Structures

Sl No	Location (Km)		Structures	Position with respect to CL
	From	To		
1	35+120	35+120	Mosque	7.5 Km towards RHS
2	69+600	69+600	Temple	4.58 towards LHS
3	57+360	57+360	Mosque	14 Km towards RHS
4	58+000	58+000	Mosque	15Km towards RHS
5	79+740	79+740	Mosque	4.39Km towards LHS
6	81+760	81+760	Temple	8Km towards LHS
7	80+740	80+740	Mosque	7.08 Km towards LHS
8	79+820	79+820	Mosque	6.9 Km towards LHS
9	80+700	80+740	Mosque	6.82Km towards LHS
10	79+560	79+560	Mosque	6.75Km towards LHS
11	79+560	79+560	Mosque	7Km towards LHS

Source: Reconnaissance Survey

4.13 Visual Resources

There are minimum visual resources present in project influence area. Gorakhpur has the tourist's locations present in project influence area. Apart from this, agricultural area in the project influence area comprises of rich natural crops like Sugarcane, paddy, wheat etc.

4.14 Natural Resource Availability

Uttar Pradesh is a major contributor to the national food grain stock. Natural resources of Uttar Pradesh exhibit a great variety. The huge mountain ranges of the state form the storehouse of a plethora of materials which cater the needs of a large number of industries. Limestone is found abundantly in the state, although its distribution differs from region to region.

Chapter 5 Anticipated Environmental impact and Mitigation measure

5.1 Prediction of Impacts

Environmental impacts have been assessed considering present environmental setting of the project area, nature and extent of the proposed activities. Suitable approach and methodology has been adopted to ascertain likely impacts both during construction and operation stage. The environmental impacts caused due to the development of the project roads can be categorized as primary (direct) and secondary (indirect) impacts. Primary impacts are those which are induced directly by the project, whereas the secondary impacts are those which are indirectly induced and typically include the associated investment and changing patterns of social and economic activities due to the proposed construction of expressway.

The construction activities will mainly be restricted to the proposed RoW along the entire stretch except for the temporary camp sites, quarry and borrow areas which are the activities associated with the construction and are usually located beyond the right of way. All the proposed construction activities will follow the current Indian standards for highway engineering design. Relatively small potential for negative impacts is generally envisaged for construction of proposed expressway. These impacts are identified in three phases:

Direct construction impacts can include the loss of agricultural land, damage to ecological features such as land resources and water bodies, damage to manmade structures and resettlement and increase in pollution load of air, water and noise quality whereas during road operation, the pollution loads will reduce in comparison to construction phase.

The construction of proposed expressway has positive influence by virtue of better connectivity and accessibility, low vehicle operating cost, quick access to marketing centers, educational and medical facilities, improvement of way side amenities, enhancement of safety for the road users as well as the population living in the vicinity of the highway, etc. and thus provide tremendous opportunities of socio-economic development of the region. Besides these, the negative environmental impacts due to the road development works can be correlated to the loss of land and properties, deterioration of environmental quality (air, water, soil and noise) and ecological degradation during various constructional works as well as during operational phase due to increase in traffic volume, change in land use pattern, landscape deterioration, etc.

The construction of proposed expressway may influence various environmental components at different stages of the project viz. pre-constructional phase, Constructional phase and Operational phase. The impacts may be direct or indirect and may be beneficial or adverse with respect to the environment. The major works associated with the construction phase mainly are site clearance, Earth work in embankment, excavation, pavement and cross drainage works, dumping of spoils and waste materials and other construction activities and associated works like mobilization of constructional equipment's, setting up of workforce camps, quarrying, transportation and storage of materials, etc. These activities have potential impacts on physical, biological as well as social environment. The impacts may be of short terms and temporary or

long terms and permanent. The likely impacts on various environmental components have been described as follows:

5.1.1 Impacts on Physical Environment

- **Impacts on Topography**

Proposed expressway passes through the plain terrain; hence there would not be significant impact on the existing topography of the area by the project works. Besides, proper balancing of cutting of slopes and filling shall be addressed, which would not alter the topography of the road.

- **Natural Hazard**

The project corridor falls under Seismic Zone-IV (As per 1893:20012) which is a severe seismic zone. Seismic design is carried out as per zone and as per codal provisions along with provision of ductile detailing and seismic arrestor Block.

This may cause failure of civil structures in the event of earthquake if design consideration related to seismicity is not taken into consideration.

Mitigation Measures

Embankment height has been decided considering all hydrological parameters, the local topography, and historical records of flood impact during event of flood.

Provisions of adequate number of cross drainage structures, viz. culverts/ bridges and roadside drainage has been made to avoid flooding/water logging. The height of embankment will be raised in the low-lying sections. However, at the same time the raised embankment shall not act as impediment to water flow during unusual event of flooding. This may aggravate the flood condition and can cause damage to the embankment. The design discharge has been evaluated for flood of 50-year return period for calculation of waterway and design of foundations.

The structure shall be designed for seismic forces as per zone IV of the seismic map as per IRC-6 if the span length is more than 15m or the total bridge length is greater than 60m.

- **Impacts on Surface Water Drainage**

With the proposed design, there are 7 Major Bridges, 13 Minor bridges, 390 Culverts in the expressway to facilitate efficient cross drainage. Minor impacts are anticipated on the surface water drainage in the project area during the construction phase due to the diversion of waterway.

Mitigation Measures

Precautions need to be taken during the construction work of culverts and bridges across these rivers and canals such that the flow in these water bodies is not obstructed thus affecting the cross drainage. In addition, any embankment work in low lying areas shall have provisions for cross drainage for natural drains to ensure that flow is not affected during construction phase. Precautions need to be taken during the construction work of culverts and bridges across these drains and rivulets that these do not get blocked which may affect the cross drainage.

- **Impact on Microclimate**

A total of approximate 21356 nos. trees will be required to be cut along the RoW which will have significant impact on the micro-climate of the region.

Mitigation Measures

The project envisaged compensatory plantation on 1:3 basis along the entire length of the expressway, including near sensitive locations which will help in improving the overall microclimate of the area. In addition, the comparison of regional data on temperature and relative humidity of the project road does not show any appreciable variation. This implies that the proposed construction of expressway works will not have any significant micro-climatic impacts because of compensatery plantation.

- **Impacts on Soil Environment**

Impact on Top Soil

The impact on soil due to the project will be in terms of topsoil erosion. Soil pollution would take place to a negligible extent due to spillage of construction material, oil, fuel, grease and asphalt around the construction yards. Care would be taken to minimize spillages of construction materials.

The loss of productive topsoil due to road construction is a direct adverse long-term impact. There will be temporary impact on productive soil at diversions, and labour camp due to leasing of land for construction period. Hence, the impact on soil during construction phase has to be controlled by strictly implementing the EMP measures suggested for the project. The top soil from the productive land shall be preserved and reused for plantation purposes. It shall also be used for embankment slope top cover for growing vegetation to protect soil erosion, filling of tree pits, re-use in borrow area redevelopment, etc. During the operation phase of the proposed project, no impact on the productive top soil is envisaged.

Loss of Productive Soil

The construction of proposed expressway will require acquisition of agricultural land. Acquisition to sensitive areas is also involved in the project. Impact on agricultural yield is anticipated due to the land acquisition. But, the benefits to the individual farmers accrued against reduced yield may get compensated through enhanced accessibility to the commercial market. Further, to offset the loss of agricultural land, institutional support to farmers in terms of enhancing the productivity of their land, improving the cropping pattern and use of high productive seeds will be provided.

Loss of productive soil, during the construction stage, is envisaged at locations of workers camps, stockyards, storage godowns, etc., if these are located on fertile areas. The EMP can ensure that no productive areas are used for these purposes to avoid adverse impact. In any case, though it would be a direct impact, it would be reversible and insignificant in nature as the land utilized shall be restored back to its original land use before handing it over back to land owner.

- **Soil Erosion**

Soil erosion will be aggravated if the vegetation is removed along the road side as roots are known to hold the soil together. This will however be for a temporary duration until the compensatory afforestation and roadside turfing have matured. It will not be possible to undertake project works without removing trees and therefore erosion will be unavoidable.

Mitigation measures such as turfing of road embankment slopes with herbs, shrubs and grasses will take care of soil erosion to a considerable extent. In borrow pits, the depth of the pit shall be regulated so that the sides of the excavation will have a slope not steeper than 1 vertical to 4 horizontals from the edge of the final section of bank. The device for checking soil erosion includes the formulation of sediment basins, slope drains, etc., cutting of trees in phases will minimize the impact. No soil erosion is envisaged when the road is in operation as all the slopes and embankments of the project road shall be stabilized through turfing, pitching, etc. as required.

- **Contamination of Soil**

Contamination of soil during construction stage is primarily due to construction and allied activities. The sites where construction vehicles are parked and serviced are likely to be contaminated because of leakage or spillage of fuel and lubricants. Pollution of soil can also occur in hot-mix plants from leakage or spillage of asphalt or bitumen. Refuse and solid waste from labour camps can also contaminate the soil. Contamination of soil during construction might be a major long-term residual negative impact. Unwarranted disposal of construction spoil and debris will add to soil contamination. This contamination is likely to be carried over to water bodies in case of dumping being done near water body locations.

However, by following mitigation measures such as maintenance of vehicles and machines and fuel refilling is carried out in a confined area can avoid contamination of soil to a great extent. The provision for oil interception chamber is suggested in EMP for treating the waste water generated from vehicle washing, refilling and maintenance areas. Fuel storage and refilling sites should be kept away from cross drainage structures and important water bodies. All spoils shall be disposed off as desired and the site shall be fully cleaned before handing over. These measures are expected to minimize the impact on soil contamination.

During the operation stage, soil pollution due to accidental vehicle spills or leaks is a low probability but potentially disastrous to the receiving environment, if they occur. These impacts can be long term and irreversible depending upon the extent of spill. The nearest fire service stations and facilities for risk management should be upgraded in order to meet the risks during the operation phase of highway.

5.1.2 Impacts on Water Resources Environment

- **Impact on Surface Water Quality**

The proposed road project is not expected to alter the existing water quality on a permanent basis. There are some water bodies, which cross the project section including lakes, nallahs, streams, etc. However, most of them remain dry during summer period.

Some impacts are anticipated on the water quality of these water bodies during the construction phase. Silt load in the streams and canals at the culvert and bridge locations may increase during construction and the spillage of hazardous chemicals during accidents may pollute the waters thereby affecting the ecosystem. The issue of blocking of cross drainage should be taken care throughout the project stretch. Care needs to be taken during the construction of culverts and bridges across canals. In case of any water supply system at the downstream of the bridge location, prior information should be made to the concerned department on the bridge construction across the water body and the construction activities should avoid discharge of any hazardous chemicals into the water body.

Degradation of water quality is also possible due to accidental discharges into watercourses from drainage of worker's camps and from spillage in vehicle parking and/or fuel and lubricant storage areas. However, mitigation measures such as construction works close to the streams and other water bodies shall be avoided, especially during monsoon period, disposal of waste arising from the project activities as per norms of MPCB and collecting and storing of bituminous wastes and taking it to approved disposal sites will minimize the impact.

During the operation phase, the possibility of degradation of water quality is very remote. The impact on the surface water quality during operation stage can be expected due to accidental spillage. However, the probability of such accidents is minimal since enhancement of road safety measures and other pedestrian facilities are taken care of in the design stage.

- **Impact on Ground Water Quality**

No activities of the project construction or operation are expected to have any significant impact on the ground water quality of the region. Water will be mainly required for compaction of formation and for domestic purpose in the workers camp. The domestic water requirement for workers camp will be mainly sourced from groundwater. Uncontrolled abstraction shall be restricted. Contamination of groundwater is not envisaged since all construction camps will have septic tanks or mobile toilets depending on the number of workers in each camp.

Mitigation measures

- Requisite permission shall be obtained for abstraction of groundwater by the contractor.
- The contractor shall make arrangements for water required for construction in such a way that the water availability and supply to nearby communities remains unaffected.
- Contractor shall arrange for safe drinking water for workers.
- Water intensive activities shall not be undertaken during summer period to the extent feasible.
- Borrow areas shall be rehabilitated as water storage structures which will also recharge the aquifer. Other options may include construction of some check dams etc.

- Rainwater harvesting structures shall be provided to replenish the ground water table.

No impact is anticipated on groundwater during operation phase.

- **Loss of Water Bodies/Sources**

There shall be impacts to water resources due to the activities during the construction stage. The impacts are due to CD works across water bodies, use of water for the construction and construction facility operations and accident spills during operation stage.

Mitigation Measures

- All efforts have been taken in while finalizing the alignment to minimize the impact on water sources.
- Most of the borrow area are proposed to be converted in ponds. This area will be much larger than impacted due to widening.
- All hand pumps and wells are proposed for relocation at suitable locations in consultation with local community.
- Water harvesting structures have been proposed along the project road in accordance with technical feasibility as per guidelines of CGWB. These measures will significantly augment the ground water availability in the area.

Provision for Rain Water Harvesting

Although the project area is not water deficient, keeping in view the water requirement and gradual decrease in water table in the project area, adequate provisions have been proposed for rain water harvesting. RWH structure as per CGWB shall be provided at every 500 m interval along the entire project stretch for ground water recharging and longitudinal drainage has been proposed to be constructed to carry the surface drain water to these bore holes.

5.1.3 Impacts on Air Environment

Vehicular emissions are one of the major sources of air quality impacts of highway projects. As the project envisages construction of Greenfield expressway for better connectivity, the project will have significant impact on air quality of the surrounding region during its construction and operation phases. However, when viewed with respect to the baseline ambient air quality or with respect to compliance of ambient air quality standards, during the construction and operational phase of the expressway, the impact on air quality is likely to be insignificant because of mitigation measures adopted during both the phases.

Impacts on air quality during the construction phase of the project will be considerable as the amount of work involved in construction of the expressway is significant. However, provision of adequate air pollution control equipment, like dust filters and measures like dust suppression by water sprinkling, wind screens, development of green belt will further help significantly to reduce the impact on air quality.

Emission of CO and NOx due to the combustion of diesel will be a principal cause of air pollution during the construction phase. The data on fuel utilization rates of units likely to be in operation during the road improvement are provided in Table below.

Table 50: Fuel Consumption Rates for Construction Machinery

Machines	Fuel Consumption (Litres/Hr)
Cement concrete mixer	7
Truck	8
Bulldozer	20
Grader	12
Roller	20
Dumpers & Tippers	18
Water Tanker	8
Paver	12

Source: Indian Institute of Petroleum

Due to ground level temperature inversion at site during winter months, meteorological conditions after the sunset tend to become stable. The overall meteorological parameters thus constitute adverse conditions for dispersion of ground-based air pollution emissions. Under adverse meteorological conditions, it may be possible that the NOx standards (80 µg/m^3 for 24 hourly average) may be violated only if the construction work is carried out round the clock. However, this scenario is not envisaged, as the construction is not proposed to be carried out throughout the day.

There will also be a rise in Particulate Matter levels due to the construction activities. The standards both for PM_{10} & $PM_{2.5}$, however, are not expected to be exceeding the permissible limits as the background levels are within the standard limits as the particulates tend to settle during low wind and stable conditions. Further, implementation of mitigation measures as given in the CEIA/EMP report will mitigate or minimize these impacts.

After construction of the proposed expressway, the traffic is expected to move smoothly at higher designed speeds, which will assure lower emissions of gaseous pollutants, further improving air quality in the region and hence not expected to affect the air quality adversely. The rate of emissions of various types of vehicles is presented in Table below. However, the extent of these impacts, at any given time will depend upon the rate of vehicular emission within a given stretch of the road; and the prevailing meteorological conditions. The impacts will have strong temporal dependence as both of these factors vary with time. The temporal dependence would have diurnal, seasonal, as well as long-term components.

A. Prediction of Carbon Monoxide (CO) Concentration Using CALINE 4 Dispersion Model along the Project Road.

The road quality will lead to induced traffic on the corridor. This additional increase in the number of vehicles will result in a slow but steady increase in the air pollution levels and

pollutant concentrations. To assess the likely concentrations at the various locations along the corridor, the prediction of the pollutant concentrations has been carried out using CALINE-4.

Environmental Significance of Carbon Monoxide (CO)

Carbon Monoxide is colorless and odorless gas, chemically inert under normal conditions and has an estimated atmospheric mean life of about two and half months. CO is emitted by incomplete burning of fossil fuel. The National Ambient Air Quality Standard (CPCB) prescribes standard limit for CO in the ambient air as 2 mg/m^3. At higher concentrations, i.e., above 5 mg/m^3 it can seriously affect human aerobic metabolism, owing to its high affinity for hemoglobin and thus would affect the central nervous system, impairing a person's time interval discrimination and brightness discrimination and over 10 mg/m^3, concentration would result in cardiac, pulmonary functional changes / failure leading to death.

Objective of the Carbon Monoxide Modeling

Carbon monoxide (CO) is the main component of the vehicular pollution. So, prediction of CO concentration is representative of the impacts of air pollution due to traffic movement. The objective of the study is to predict CO concentration in the ambient air on project road by 2025, 2030, 2035, 2040, 2045 and 2050 using CALINE - 4 dispersion model. The Ministry of Environment, Forest and Climate Change (MoEF&CC) has made CO concentration study as mandatory and recommends CALINE - 4 model for Highway projects.

Brief description of CALINE– 4

CALINE-4 is line source Gaussian plume dispersion model developed by the California Department of Transportation, employing a mixing zone concept to characterize pollutant dispersion over the highway. The main purpose of the model is to assess air quality impacts near transportation facilities. Given source strength, meteorology and site geometry, CALINE-4 can predict the pollutant concentrations for receptors located within 500 meters of the roadway. It predicts the air concentrations of carbon monoxide (CO), nitrogen oxides (NOx), and suspended particles matter (SPM) near roadways. CALINE-4 model can be run for Standard and Worst-case conditions to predict the increment in pollutants concentration due to the proposed activity. For the present project, the model was used to predict for worst case scenario, to predict the maximum pollution levels at receptors due to proposed project.

Terminology used in CALINE - 4 model

The model is broadly divided into five screens such as Job Parameters, Link Geometry, Link Activity, Run Condition, and Receptor Positions.

Job Parameters: It contains general information that identifies the job, defines general modeling parameters, and sets the units (feet or meters) that will be used to input data on the Link Geometry and Receptor Positions Screens.

Run Type: This determines averaging times (for CO concentrations) and how the hourly average wind angle(s) will be determined. Most common is the "worst-case wind angle" run type to estimate 1-hour average CO concentration.

Aerodynamic Roughness Coefficient: This determines the amount of local air turbulence that affects plume spreading. CL4 offers the following 4 choices for aerodynamic roughness Coefficient:

- Rural: Roughness Coefficient = 10 cm
- Suburban: Roughness Coefficient = 100 cm
- Central Business District: Roughness Coefficient = 400 cm
- Other: From Table 2 from the CL4 User's Guide as guidance to select an appropriate value.

Link/Receptor Geometry: Units the geometry of the roadway links and receptor positions are defined in Meters. Meteorological inputs always require inputs with metric units.

Emission Factor: The weighted average emission rate of the local vehicle fleet, expressed in terms of grams per mile per vehicle.

Altitude above Sea Level: This defines the altitude above mean sea level. This input is used to determine the rate of plume spreading. It does not affect the Link Geometry or Receptor Positions.

Link Geometry: It defines the roadway network to be modeled. Each row in the matrix defines a single link. Up to 20 links may be entered. Links are defined as straight-line segments. The distance between the centerline of the curved roadway, and the straight-line link should be no greater than 3 meters. For bridges, link length must be greater than roadway width.

Link Type: There are 5 choices available such as At Grade, Fill, Depressed, Bridge and Parking lot. In this particular model study At Grade link types are used.

Endpoint Coordinates: The endpoint coordinates, (X_1, Y_1) and (X_2, Y_2), define the positions of link endpoints. Link geometry and receptor positions are defined with a Consistent Cartesian coordinate system.

Link Height: For all link types except bridges, Link Height represents the height of the link above the surrounding terrain.

Mixing Zone Width: Mixing zone is defined as the width of the roadway, plus 3 meters on either side. The minimum allowable value is 10 meters, or 32.81 feet. (Width of Roadway including shoulders)

Link Activity: It defines the level of traffic and auto emission rate observed at each link.

Traffic Volume: The hourly traffic volume anticipated to travel on each link, in units of vehicles per hour.

The Run Conditions: Run condition screen contains the meteorological parameters needed to run CALINE4.

Wind Speed – Wind speed expressed in meters per second.

Wind Direction - The direction the wind is blowing from, measured clockwise in degrees from the north.

Wind Direction Standard Deviation - The statistical standard deviation of the Wind Direction, sometimes termed "sigma theta". Table 2 (CL4 User's Manual) provides guidance for this choice.

Atmospheric Stability Class - A measure of the turbulence of the atmosphere. Values 1 through 7 correspond to the standard definitions for stability class A through E. Table 2 (CL4 User's Manual) provides guidance for this choice. Stability class E (or 7) represents the most stable conditions.

Mixing Height - The altitude to which thermal turbulence occurs due to solar heating of the ground. Standard mixing height is assumed as 1000 meter.

Ambient Pollutant Concentration - This measure reflects the pre-existing background level of carbon monoxide, expressed in parts per million (ppm).

Ambient Temperature - The ambient air temperature significantly affects vehicle CO emissions. A temperature that reflects wintertime conditions should be selected, expressed in degrees Celsius.

The Receptor Positions Screen contains the data inputs for all receptor positions, such as Habitations, Settlements Plantation, Vegetation, Water Bodies, and Air sampling location etc. and also displays a diagram of the link geometry and receptor positions. Receptors should be defined with the same Cartesian coordinate system and units of measure as the link geometry.

Receptor Height - Z coordinate standard 1.8 meters assumed.

Averaging Interval- 1-hour average CO concentration at the receptors.

Input Parameters for Model

The various input parameters for the prediction of pollutant concentrations are discussed in the following sections:

(a) Site Geometry: The input parameters regarding the site conditions as the carriageway width, road height, mixing zone width, surface roughness and topographic conditions have been taken up from the pavement condition and road inventory surveys conducted along the project corridor.

(b) Emission factors: The emission factors for the various vehicle categories vary for different speeds. The emission factors adopted for the various vehicle speeds for the various pollutants are given in Table below. Based on the traffic composition, a composite emission factor has been derived for application in the model for the various sensitive receptors and links. The composite emission factor has been derived as a sum of the ratio of light, medium and heavy vehicles to the total volume and their corresponding emission factors.

Table 51: Emission Factors for Criteria Pollutants

Sr. No.	Pollutant	Emission Factor (g/km/PCU)
1.	CO	3.01
2.	NOx	0.84
3.	SO_2	0.33
4.	PM_{10}	0.19
5.	$PM_{2.5}$	0.10

(c) Meteorological Conditions: The various meteorological input parameters required for modeling as the wind speed, wind direction, mixing height, stability class have been collected from primary baseline data (Sept 21 to Aug 22) and secondary sources as IMD Gorakhpur meteorological station.

(d) Traffic volume: The through traffic volume and composition along the sensitive receptors have been derived from the traffic volume counts carried out at various locations along the project expressway during traffic survey.

(e) Links: Links are homogenous sections of the project corridor, of length not greater than 10 km, with similar traffic, site geometrics and meteorological characteristics. For calculating the emissions, worst-case scenario is assumed and concentrations are obtained for worst wind direction.

(f) Receptors: Receptors are specific locations within a link, which is likely to be impacted by vehicular emissions. For the purposes of assessing air impacts, sensitive receptors have been identified over an immediate influence area on either side of the project corridor.

The concentrations of the various pollutants due to the project have been estimated applying the various input parameters to the CALINE 4 model.

Table 52: Speed Corrected Emission Factors

Pollution Parameter	Emission factors g/mile		
	Light	Medium	Heavy
	(Irrespective of speed)		60Kmph
CO	13.97	7.70	6.95
NOx	14.23	2.48	8.94

Predicted Pollution levels

No significant change in emission characteristics of the vehicles is anticipated during the projected period and any assumption in decrease of emission factors would only be hypothetical. This assumption would give a conservative estimate of the emissions and any decrease in emissions in future than those used for prediction will be beneficial. The traffic along the proposed section is assumed to flow simultaneously in both the lanes and in both directions. This assumption presents a worst-case scenario of the pollution levels. The incremental pollution levels predicted along the project corridor at various receptors are presented in the Tables below for the years 2025, 2030, 2035, 2040, 2045 and 2050. The predictions have been made for the pollutants CO and NOx. The predicted concentration also

takes into account the existing pollutant levels as established by the on-site ambient air quality monitoring data.

Table 53: Predicted CO Concentrations

Season-1 (Sept 21 to Nov 21)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	610	36	54	76	98	127	139	646	664	686	708	737	749
2	Ch. 36+800	590	23	38	60	82	102	117	613	628	650	672	692	707
3	Chaudia Masan	600	23	38	60	82	102	117	623	638	660	682	702	717
4	Daswat Pur Ethiya	600	32	49	68	93	118	129	632	649	668	693	718	729
5	Mahadevpur	600	22	45	57	81	98	109	622	645	657	681	698	709
6	Mutkallipur (End of Alignment)	590	25	49	63	89	104	112	615	639	653	679	694	702

Season-2 (Dec 21 to Feb 22)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	710	41	59	81	105	138	145	751	769	791	815	848	855
2	Ch. 36+800	670	28	41	68	87	115	124	698	711	738	757	785	794
3	Chaudia Masan	670	25	41	66	84	110	121	695	711	736	754	780	791
4	Daswat Pur Ethiya	740	36	53	71	98	121	136	776	793	811	838	861	876
5	Mahadevpur	610	25	49	62	84	102	118	635	659	672	694	712	728

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
6	Mutkallipur (End of Alignment)	710	28	51	69	94	112	126	738	761	779	804	822	836

Season-3 (March 22 to May 22)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	720	34	51	76	98	126	134	754	771	796	818	846	854
2	Ch. 36+800	690	21	38	62	81	101	121	711	728	752	771	791	811
3	Chaudia Masan	680	19	36	59	77	99	110	699	716	739	757	779	790
4	Daswat Pur Ethiya	710	32	47	67	89	114	126	742	757	777	799	824	836
5	Mahadevpur	630	22	43	58	79	98	104	652	673	688	709	728	734
6	Mutkallipur (End of Alignment)	720	24	49	62	86	104	112	744	769	782	806	824	832

Season-4 (June 22 to Aug 22)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	690	25	42	64	79	112	121	715	732	754	769	802	811
2	Ch. 36+800	670	18	31	54	72	92	111	688	701	724	742	762	781
3	Chaudia Masan	670	16	29	49	69	89	98	686	699	719	739	759	768
4	Daswat Pur Ethiya	690	24	39	57	79	102	111	714	729	747	769	792	801

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
5	Mahadevpur	660	17	35	47	65	82	96	677	695	707	725	742	756
6	Mutkallipur (End of Alignment)	700	19	39	57	79	99	102	719	739	757	779	799	802

Table 54: Predicted NOx Concentrations

Season-1 (Sept 21 to Nov 21)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	22.22	4.6	6.84	9.37	14.05	19.43	23.13	26.82	29.06	31.59	36.27	41.65	45.35
2	Ch. 36+800	23.51	3.3	4.76	6.87	9.76	13.58	16.34	26.81	28.27	30.38	33.27	37.09	39.85
3	Chaudia Masan	22.85	2.8	4.65	7.23	9.88	12.49	14.98	25.65	27.5	30.08	32.73	35.34	37.83
4	Daswat Pur Ethiya	23.85	4.6	6.84	9.37	14.05	19.43	23.13	28.45	30.69	33.22	37.9	43.28	46.98
5	Mahadevpur	22.87	3.1	4.45	7.11	8.95	11.63	13.26	25.97	27.32	29.98	31.82	34.5	36.13
6	Mutkallipur (End of Alignment)	23.88	3	4.15	7.14	9.24	11.89	13.63	26.88	28.03	31.02	33.12	35.77	37.51

Season-2 (Dec 21 to Feb 22)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	25.34	5.3	7.12	10	15.6	21.2	25.14	30.64	32.46	35.34	40.94	46.54	50.48
2	Ch. 36+800	23.66	3.9	5.1	7.12	10.58	14.25	18.31	27.56	28.76	30.78	34.24	37.91	41.97
3	Chaudia Masan	25.16	3.5	4.98	7.85	10.65	13.1	15.36	28.66	30.14	33.01	35.81	38.26	40.52
4	Daswat Pur Ethiya	25.69	5.2	7.32	9.68	14.78	20.12	24.1	30.89	33.01	35.37	40.47	45.81	49.79
5	Mahadevpur	24.54	3.8	5.1	7.52	9.63	12.11	13.98	28.34	29.64	32.06	34.17	36.65	38.52

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
6	Mutkallipur (End of Alignment)	26.29	3.6	4.85	7.89	9.81	12.65	14.24	29.89	31.14	34.18	36.1	38.94	40.53

Season-3 (March 22 to May 22)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	25.47	4.12	6.39	9.21	14.21	20	23.45	29.59	31.86	34.68	39.68	45.47	48.92
2	Ch. 36+800	24.54	3.11	4.26	6.65	9.15	13.24	17.63	27.65	28.8	31.19	33.69	37.78	42.17
3	Chaudia Masan	25.06	3	4.1	6.98	9.87	12.14	14.23	28.06	29.16	32.04	34.93	37.2	39.29
4	Daswat Pur Ethiya	25.37	4.4	6.74	8.89	13.85	19.15	23.01	29.77	32.11	34.26	39.22	44.52	48.38
5	Mahadevpur	25.49	2.9	4.4	6.98	8.69	11.25	12.17	28.39	29.89	32.47	34.18	36.74	37.66
6	Mutkallipur (End of Alignment)	25.47	2.95	3.95	6.82	8.89	11.25	13.29	28.42	29.42	32.29	34.36	36.72	38.76

Season-4 (June 22 to Aug 22)

Sr. No.	Location	Baseline levels (µg/m^3)	Predicted Incremental Values						Operation phase predicted values					
			2025	2030	2035	2040	2045	2050	2025	2030	2035	2040	2045	2050
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment - NH)	24.21	3.9	4.69	8.12	12.65	18.98	21.32	28.11	28.9	32.33	36.86	43.19	45.53
2	Ch. 36+800	24.84	2.58	3.45	5.78	8.25	12.14	16.47	27.42	28.29	30.62	33.09	36.98	41.31
3	Chaudia Masan	24.3	3.68	3.56	2.79	8.84	11.12	13.87	27.98	27.86	27.09	33.14	35.42	38.17
4	Daswat Pur Ethiya	24.35	3.69	5.81	7.58	10.26	18.14	22.19	28.04	30.16	31.93	34.61	42.49	46.54
5	Mahadevpur	24.33	2.12	3.9	5.98	7.63	10.23	11.19	26.45	28.23	30.31	31.96	34.56	35.52
6	Mutkallipur (End of Alignment)	24.27	2.11	2.98	5.86	7.96	10.36	12.29	26.38	27.25	30.13	32.23	34.63	36.56

Conclusion

As evident from the above Tables, with the increase in traffic volume, the concentration of air pollutants also increases correspondingly. The predicted CO and NOx concentrations including ambient level at all locations are well within the National Ambient Air Quality Standards (2000 µg/m^3 and 80 µg/m^3 respectively) for the projected years. It may be relevant to mention that above predictions are on the conservative side. Actual concentrations are expected to be lower in future years as there will be further stringent norms for vehicular emissions.

Use of eco-friendly fuel and the action plan:

As per the Niti Aayog dated June 2021 report of expert committee on Roadmap for Ethanol Blending in India by 2025, 20% ethanol blending is recommended in petrol for gradual rollout of E20 ethanol in the country.

Continuous Online AAQ Monitoring Installation:

Two (2) nos. Continuous Online AAQ Monitoring Installation are proposed at each toll plaza.

5.1.4 Impacts on Ambient Noise Level

Construction Stage

During the construction phase of the road, the major sources of noise pollution are vehicles transporting the construction material to the construction yard and the noise generating activities at the yard itself. Mixing, casting and material movement are primary noise generating activities in the yard and will be uniformly distributed over the entire construction period. Construction activities are anticipated to produce noise levels in the range of 80 - 95 dB (A). The construction equipment will have high noise levels, which can affect the personnel operating the machines. Use of proper Personal Protective Equipment (PPE) such as earmuffs will mitigate any adverse impact of the noise generated by such equipment.

The noise levels in the working environment are compared with the standards prescribed by Government of India through model rules framed under the Factories Act. The acceptable limit for each shift being of 8-hour duration; the equivalent noise level exposure during the shift is 90 dB (A). Hence, noise generated due to various activities in the construction camps may affect workers, if equivalent 8-hour exposure is more than the safety limit of 85 dB (A). Exposure to impulses or impact noise should not exceed 140 dB (A) (Peak acoustic pressure). Exposure to 10,000 impulses of 120 dB (A) is permissible per day. The noise likely to be generated during excavation, loading and transportation of material will be in the range of 90 to 105 dB (A) and this will occur only when all the equipment operate together and simultaneously. This however, is a remote possibility. The workers in general are likely to be exposed to an equivalent noise level of 80 to 90 dB (A) in an 8-hour shift, for which all statutory precautions should be taken into consideration.

However, careful planning of machinery selection, operations and scheduling of operations can reduce these levels. As the project road does passes through few populated areas at villages and urban areas comprising few sensitive receptors such as colleges and religious institutions located

along the road, people in these places will be exposed to marginally high noise levels. To avoid impacts on human health, it is recommended to avoid construction work at these sections during night times and ensure that only minimum required machinery is deployed on the site. Uninterrupted movement of heavy and light vehicles at high speeds may cause increase in ambient noise levels on the project road.

Operation Stage

During the operation stage the noise generated by vehicles will have adverse impact on residents of settlements located close to the corridor. Apart from the dwelling areas, the sensitive receptors consisting of occupants at educational institutions, temples, hospitals, etc. will also be impacted.

Noise Modeling & Prediction of Noise Impacts

Noise produced by vehicles during the operation stage will increase with increasing volumes of traffic on the corridor. Deterioration in the surface conditions of the pavement over a period of time also increases the noise levels. Apart from the above two factors, nature of the vehicle and the properties of the tyre influence the operational noise levels. Noise impacts can be predicted at various receptors by application of available simulation models for Highway noise. However, this is applicable only for operation stage of the project. Operational noise for the highway is predicted through the Community Noise Model (CNM) developed by University of Central Florida for American Automobile Manufacturers Association.

The constant speed model uses few traffic algorithms since the vehicles travel at a constant speed and flow is not interrupted. The vehicles present in the simulation are assigned a vehicle speed based on the user determined speed of the traffic lane. All vehicles on the same lane travel at the same speed. Noise levels are determined from vehicle type and speed specific Reference Energy Mean Emission Level (REMEL) curves and from attenuation due to distance, ground effects, barriers and atmospheric absorption. ISO-9613 algorithms are used where appropriate. The model adds vehicles to traffic lanes in a random fashion during each time step but keeps track of the number of vehicles so that the user defined volume is maintained. The constant speed model utilizes the *Fresnel number* and *path length difference* approach to determine the attenuation due to barriers placed between receivers and traffic lanes. The REMEL curve used by CNM Model incorporates the latest data for five common vehicle types. The REMEL used by the CNM characterized noise levels from newer model year vehicles. In general newer cars have quieter engines due to engine compartment shielding but higher tire/road interaction noise due to the newer higher performance tires on many of the today's vehicles. The equation for the new REMEL curves if used A weighted levels are shown below:

REMEL dB(A)= 10*Log(0.6214*kph) $^{A/10}$***10**$^{B/10}$ ***10**$^{C/10}$

where: A,B,C are curve coefficients

kph = vehicle speed (km/h)

Predicted Noise Levels

For the prediction of noise levels, it is assumed that all the traffic is in well-defined lanes and flow of traffic in both the directions is same. Details of Receptors selected and value of predicted Noise Levels are presented in Tables as under:

Table 55: Receptors selected for Prediction of Noise Levels

Location No.	Receptor Name	Receptor (Building) Distance from proposed CL (m)	Type
1	Chapiya Fish Farming Office at Narkatha (Start of Alignment -NH)	15	Commercial
2	Ch. 36+800	35	Residential
3	Chaudia Masan	30	Residential
4	Daswat Pur Ethiya	22	Residential
5	Mahadevpur	20	Residential
6	Mutkallipur (End of Alignment)	25	Commercial

Table 56: Predicted Noise Levels in dB(A)

Particulars	Values of Noise level in Future Years (Without Barrier) dB(A)					
	2025	2030	2035	2040	2045	2050
Receptor 1	59.2	59.5	60.1	60.4	61.2	62.0
Receptor 2	51.9	52.1	52.4	52.3	52.8	52.9
Receptor 3	50.9	51.2	51.4	51.9	52.3	52.6
Receptor 4	52.5	52.9	53.1	53.4	53.6	54.0
Receptor 5	52.6	52.9	53.0	53.2	53.4	53.4
Receptor 6	61.4	61.6	61.9	62.1	62.3	62.7

Conclusion

Predicted noise levels are within the stipulated limits. Provision of Noise Barriers as part of EMP shall further attenuate noise levels at the identified noise sensitive receptors.

5.1.5 Impacts on Biological Environment

Impact on Fauna

The increased activities of vehicle movement disturb the sensitive movements of fauna. The impacts are expected to be more severe during the times of accidents of vehicles carrying hazardous chemicals. In the absence of proper accident management mechanisms, such accidents will be very hazardous to fauna of the region. From the site visits and discussion with officials it is inferred that there are no noticeable habitats or wild or endangered animal habitats along vicinity of the project road. But construction of proposed expressway will result in increased human activities near such habitats. Further, noise due to construction machineries and increased vehicular movement for raw material transportation for road construction will disturb the faunal species along the area during construction phase. Due care should be taken in the construction stage that human activities should be completely restricted to the proposed

RoW such that there should not be any human ingress into such areas for poaching of animals / any other items.

Impact on Migratory Birds:

The well-known direct effects of roads on birds include habitat loss and fragmentation, vehicle-caused mortality, pollution, and poisoning. Nevertheless, indirect effects may exert a greater influence on bird populations. These effects include noise, artificial light, barriers to movement, and edges associated with roads. Moreover, indirect and direct effects may act synergistically to cause decreases in population density and species richness.

As there are no Protected Area lies within 10 km from expressway, there will not be any migratory birds route in usual circumstances.

Impact on Ecological Resources

Also based on the reconnaissance by the Consultant, it was observed that that there is no endangered flora in the project influence area and hence the impact of the loss of vegetation will not be very severe. Cutting of few avenue trees is envisaged along the realigned stretches of the project road. Approximately 21356 nos. of trees have to be cut down along the proposed RoW. However, compensatory avenue plantation with thrice the number of trees to be cut is proposed as a part of Environmental Management Plan. Site specific indigenous tree species shall be selected for compensatory afforestation and will be implemented through State Forest Department.

No direct impact is anticipated during operation stage except accidental damages or absence of proper tree management. Positive impacts on terrestrial ecology are expected during the project operation due to the increase in vegetation and plantation along the highway. The Project execution team will coordinate with the local communities to maintain and enhance the trees planted along the road. Survivability of compensatory plantation shall be monitored as per monitoring plan.

Removal of Trees and Landscaping

Tree cutting is envisaged during the widening of the existing road. Broad guidelines or mitigation measures are listed below for the mitigation of impacts due to the removal of trees:

- All the major and sensitive tree species, wherever possible shall be transplanted to minimize the impacts of loss of vegetation
- Thrice the number of plants should be planted for each tree felled/removed as a part of compensatory plantation. The compensatory plantation should be done in consultation with the forest department of the area. Adequate care of the compensatory plantation should be taken up so as to achieve over 90% survival rate.
- Landscaping should be done with a lag of 3 to 4 months from the start of the work on any section. The section should be deemed to be complete when the landscaping is over.
- Survival rate of plants must be included in the contract specifications so as to ensure that the compensatory plantation achieves the objective of compensating lost trees.

- Indigenous and endemic tree species suitable for the area should be planted at the onset of monsoon season. The plants should be provided with adequate protection from animals and proper monitoring should be carried out to ensure their growth.

Tree Plantation Details

A study on the local flora and existing avenue trees has been carried out as part of the field surveys to enable a choice of the suitable species for avenue trees. The criteria for selection of species for choice as avenue tree is that the species is indigenous and suited to the soil and rainfall of the area, and hardy and needs no attention after the maintenance period as per IRC:SP-2009. Hence the tree species selected for the proposed Roadside Plantation as per IRC: SP-2009 are as under:

Table 57: Proposed Tree Species for Roadside Plantation

Sr. No.	Trees proposed at 12m c/c	
	Botanical Name	Common Name
1	Azadirachta Indica	Neem
2	Ficus Religiosa	Peepal
3	Dalbergia Sissoo	Sheesham
4	Pongamia Pinnata	Karanj/Papari

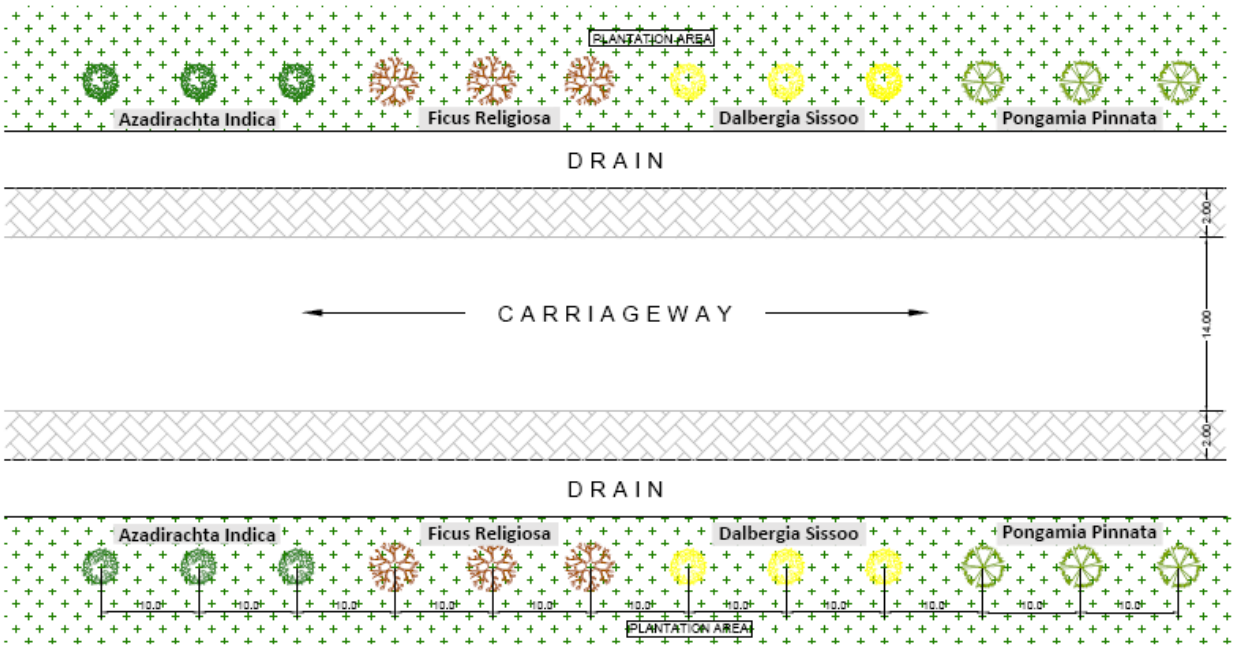


Figure 82: Schematic of Roadside Plantation

5.1.6 Impacts on Human Use Values

Land Acquisition

The proposed expressway will involve acquisition of land and some structures of commercial/residential nature. A detailed analysis of the impacts of land acquisition and structures in the project area shall be presented in the social assessment report. However, the

project area runs through agricultural and developed urban areas and hence the impacts of land acquisition are expected to have effect on livelihood and economic activities of the project area. Appropriate rehabilitation action plan as worked by the social team of the consultants, shall be implemented to mitigate /minimize these impacts.

Construction of Site / Camp Buildings

This activity will involve construction of buildings for office, construction camps and habitation during the construction phase. This may result in clearing of vegetation and pose sanitary & health problems in the construction camps. Due care should be taken to maintain hygienic conditions at site by providing proper drinking water and sanitation facilities. However, the impact due to such activities is reversible and short term.

Transport and storage Material

The construction material primarily will consist of aggregate, sand, cement, bitumen, lubricating oil and fuel for vehicle and construction equipment's. These will be primarily stored temporarily at construction camps. The oils, fuels and chemicals will be stored on concreted platform with spills collection pits. The cement will be stored under cover. All these temporary storage areas will be located at least 150 m away from the habitat.

5.2 Positive Impacts of Project

The immediate benefits of road construction will come in the form of direct employment opportunities for the roadside communities and specially those who are engaged as wage laborers, petty contractors and suppliers of raw materials. Road-side economic activities will increase due to increased number of vehicle using the road. Economic activities supporting transport like gasoline stations, automotive repair shops, lodging, and restaurants are expected to increase. Increased agro-industrial activities are also expected to take advantage of improved access to urban centers where there are higher demands and better prices for agricultural products. Other generic benefits of such projects are (i) reduction in travel time (ii) better mode and frequency of transport (iii) access to quality health care facilities, educational and other infrastructural facilities and (v) better investment climate for industries creating more employment opportunities to local people.

Chapter 6 Environmental Monitoring Programme

6.1 Introduction

The critical environmental impact due to the project will be the clearance of cultivated area. Other issues of concern will be changes in air and water qualities and noise levels during construction stage due to construction activities and due to increased vehicular movements during operation stage. While the impacts are not very severe, care has to be taken to ensure that the ambient environmental conditions do not deteriorate further. The project on whole will improve connectivity to the region and provide safe and efficient high level of service to the vehicles.

In order to address the impacts predicted in Chapter 5, various mitigation measures, monitoring actions and a reporting schedule are suggested in this Chapter in the form of an Environmental Monitoring Programme.

In respect of category B projects, it shall be mandatory for prior environmental clearance (EC) is to be obtained from State Environmental Impact Assessment Authority (SEIAA), constituted by the Govt. of India, according to the EIA Notification dated 14th September 2006 and its amendments issued by MoEF&CC and safeguards at their cost by prominently advertising it at least in two local newspapers of the district or state where the project is located and in addition, this shall also be displayed in the project proponent's website permanently.

6.2 Environmental Monitoring Plan for the subproject

Various physical, biological and social components identified as of particular significance in affecting the environment at critical locations in various stages of the project have been suggested as Performance Indicators (PIs). Performance Indicators listed below shall be the focus for monitoring.

- Air quality along the project road;
- Surface and ground water quality along the project road;
- Noise levels near sensitive locations; and
- Re-plantation success / survival rate.

For each of the environmental components, monitoring plan specifies the technical aspects of monitoring like locations of monitoring; frequency of monitoring and duration, sampling method, parameters to be monitored and standards to be monitored in analyzing. The monitoring plan also specifies the applicable standards and implementation and supervising responsibilities. The environmental monitoring plan is presented in **Table 58**.

Table 58: Environmental Monitoring Plan

Air Quality Monitoring	
Project stage	Construction and operation stages
Parameter	PM10, PM 2.5, SO_2, NO_x, CO and Pb
Sampling Method	High volume air sampler to be located 50 m from the source of pollution in the downwind direction. Method specified by CPCB for analysis shall be followed.

Standards	Revised National Ambient Air Quality (NAAQ) Standards set by CPCB
Frequency	One continues sample from 7 locations for PM_{10}, $PM_{2.5}$ Three 8 hourly samples from 7 locations for SO_x, NO_x, CO
Duration	Continuous 24 hours for 1 full working day
Locations	At the start and end of the proposed alignment, at toll plaza, near sensitive features like colleges, densely populated area and cultivated area along the road at an average distance of 10 Km during operation stage.
Measures	Wherever air pollution parameters increase above specified standards, additional measures as decided by the engineer shall be adopted.
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA (or) Sub consultants appointed by UPEIDA
Water quality Monitoring	
Project stage	Construction stage
Parameter	pH, Temperature, Turbidity, Mg, Hardness, Total alkalinity, Chloride, Sulphate, Nitrate, Flouride, sodium, potassium, salinity, total nitrogen, totalphosphorous, DO, BOD, COD, Heavy metals, Total Coliforms, Faecal Coliforms, phytoplankton.
Sampling Method	Grab sample collected from source and analysis as per Standard Methods for Examination of water and Waste water
Standards	Indian standards for Inland Surface Water (IS; 2296, 1982) and for Drinking water (IS; 10500,1991)
Frequency	One samples from thirteen locations (2 sample of Ground Water and 11 samples of Surface water which involves 6 rivers along the alignment, major ponds and Nalla)
Duration	One-time grab sampling
Location	At major water bodies along the road at an average distance of 20 Km
Measures	At locations of increased water pollution towards downstream, all inflow channels shall be checked for pollution loads and channel delivering higher pollution loads shall be terminated from disposal into the water source.
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA (or) Sub consultants appointed by UPEIDA
Noise Level Monitoring	
Project stage	Construction and operation stages
Parameter	Noise level on dB (A) scale
Sampling Method	Measure equivalent noise levels using an integrated noise level meter kept at a distance of 15m from edge of the pavement
Standards	Noise Pollution (Regulation and Control) Rules, 2000
Frequency	Hourly samples from 7 locations
Duration	Reading to be taken at 15 seconds interval for 15 minutes every hour for 24 hours and then average will be taken.
Location	At the start and end of the proposed Alignment, near sensitive features like colleges, densely populated area and cultivated area along the road at an average distance of 10 Km during operation stage.
Measures	In case of noise levels causing disturbance to the sensitive receptors,

	management measures as suggested in the EMP shall be carried out.
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA (or) Sub consultants appointed by UPEIDA
Soil Quality Monitoring	
Project stage	Construction
Parameter	Monitoring of Colour, texture, water holding capacity, porosity, permeability, electrical conductivity, pH, Organic Matter
Sampling Method	Sample of soil collected to be acidified and analyzed using absorption spectrophotometer
Standards	Threshold for each contaminant set by IRIS database of USEPA until national standards are promulgated
Frequency	One sample from 4 locations
Duration	One-time grab sampling
Location	At productive agriculture lands abutting traffic detours and traffic diversions and major intersections at an average distance of 20 Km along the road.
Measures	At location of increased pollution levels, source shall be identified and shall be diverted from future disposal
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA (or) Sub consultants appointed by UPEIDA

6.3 Training Requirement

For the successful implementation of EMP it is important that the agencies and particularly the officials involved in the Investment Program should have an understanding of the environmental assessment procedures and also of environmental issues of various urban infrastructure components. As far as implementation of mitigation measures on site is concerned the Contractor will be involved. Hence, it is important to orient the contractors and supervisory staff towards the implementation of mitigation measures and their consequences. Hence, considering the existing capabilities of the agencies involved, the following training program is suggested. PC will conduct the training as a part of or during the monthly progress review meeting.

Table 59: Details of Training Requirements

Description	Contents	Schedule	Participants
Program 1 Orientation Program/	Module 1 – Orientation	4 hrs	PMU officials involved in the
Workshop for Implementing Agency and Executing Agency	Indian Environmental Laws & Regulations relating to urban infrastructure Investment Program Environmental impacts of urban infrastructure Investment Programs Module 2 - Environmental Assessment Process Conducting Field Reconnaissance Identification of Environmental Impacts Identification		Investmen tProgram ULB officials involved in Investment Program implementatio n

	Mitigation Measures Formulation of EnvironmentalManagement Plan Implementation and Monitoring Incorporation of mitigating measures in the Investment Program design and contracts		
Program - 2 Orientation Program/ Workshop for Contractors and Supervisory staff	Module 1 - Implementation of Mitigation Measures Environmental issues related to urban infrastructure Investment Programs during construction Implementation of mitigation measures Monitoring of implementation Emergency and Safety response for Disaster Management	2 hrs	Contractors Supervisory staff of ULB
Program - 3 Experience Sharing	Module – Experiences and Best Practices Experiences on implementation in terms of environmental concerns of implemented Investment Programs Best Practices followed	4 hrs (every alternative year from the start of Investment Program, i.e. 2008)	PMU officials ULB officials Local NGOs

Chapter 7 Additional Studies

Public participation was undertaken to make explicit the social factors that will affect the development impacts of planned expressway construction and mediate project results. Through public participation, stakeholders and key social issues were identified and strategy was formulated. It included socio-cultural analysis and design of social strategy, institutional analysis and specifically addressed the issue of how poor and vulnerable groups may benefit from the project.

The consultation process established during preparation stage of the project used different types of consultation such as in-depth interviews with key informants, focus group discussions and meetings. The consultation program included the following:

- Heads of households likely to be impacted;
- Household members;
- Villagers;
- Village panchayats; and
- Government Agencies and Departments.

The main objectives of the consultation programs were to make people aware of the construction of proposed expressway and to ascertain the views and preferences. The aims of community consultations were:

- To understand views of the people affected w.r.t to the impacts of the road
- To identify and assess all major economic and sociological characteristics of the village to enable effective planning and implementation and;
- To resolve the issues relating to the impacts on community property, if any.

7.1 Local Level Consultations

Local level consultations were carried out in affected villages and all the comments received have been incorporated in Resettlement Action Plan. Efforts were made to select both small and big habitations along the project road in order to get representation of all the segments of affected population. Prior intimation before the planned consultation meeting was given to Village office /Sarpanch /Villagers, so that the villagers were aware of date and location of meeting before hand for active participation. The objectives of local level consultations were to inform the affected persons about the project, R&R policy, to incorporate their views on the policy in SIA/RAP and mitigation measures as suggested by them.

Consultation team included social and community development expert, local surveyor and technical expert.

The details of public consultation was given in SIA/RAP report.

7.2 Conclusion of Stakeholder Consultations

All the stakeholder's suggestions and comments were conveyed to the contractor for consideration and incorporation during project implementation. It can be concluded that all the concerns of stakeholders have been taken into account in the project planning and construction and operation issues.

Chapter 8 Project Benefits

The main objective of the project is to provide safe and efficient service levels to growing traffic and better connectivity in the region. All road users will be benefited from the proposed improvement on account of comfort, safety and reduced vehicle operating costs.

The project highway is proposed to be developed to 4 lanes with paved shoulder expandable to 6 lanes divided carriageway with 15 meter depressed median for future widening. It will enable the movement of heavy traffic, resulting in enhancement of socio- economic condition of the region as well as the neighboring states. The proposed Express way increases a community's direct access to the capital of the state, Lucknow.

The economic impact of transportation projects can be measured in the benefits they bring to economic growth, job creation, trade facilitation, and the economies of scale created. Development of the proposed project road will help the local farmers and businessmen to trade their commodities to nearby cities/towns. Due to better infrastructure reputed educational or health institutes will find it attractive and viable to establish themselves in the project influence area, leading to development of social infrastructure for the local residence. With the advent of expressway, the vehicle operating and maintenance cost is expected to go down substantially.

The improved road network will undoubtedly bring in changes in land use along the project road, leading to local economic development, increase in land and property values, as well as overall development of the region. People will have increased access to better social and health infrastructure located in faraway places. This will in turn lead to overall improvement of the quality of life of the people residing in the project zone in terms of their economic, social and health status. Growth of local tourism is also expected due to better road infrastructure.

A significant short term economic benefit of the improvement project is generation of employment opportunities to the people (including affected community) during the construction activities. Besides, they will also draw benefits from the economic activities such as road side stalls/shops, street vendor, etc. as a result of increased traffic flow and movement of vehicles. This project will be a giant leap in the development process of the entire region.

Chapter 9 ENVIRONMENTAL MANAGEMENT PLAN

9.1 Introduction

The critical environmental impact due to the project will be the clearance of cultivable area. Other issues of concern will be soil erosion, changes in air and water qualities and noise levels during construction stage due to construction activities and due to increased vehicular movements during operation stage. While the impacts are not very severe, care has to be taken to ensure that the ambient environmental conditions do not deteriorate further. The project on the whole will improve connectivity to the region and provide safe and efficient high level of service to the vehicles.

In order to address the impacts predicted in Chapter 5, various mitigation measures, monitoring actions and a reporting schedule are suggested in this Chapter in the form of an Environmental Management Action Plan (EMAP). The EMAP is a plan of action for avoidance, mitigation and management of the negative impacts of the project. Environmental enhancement is also an important component of EMAP.

The EMAP includes a list of all project-related activities, impacts and their mitigation measures at different stages of project (Construction Phase and Operation Phase), Environmental Monitoring Plan and a clear reporting schedule. The EMAP sets a time frame to all proposed mitigation and monitoring actions with specific responsibility assigned to the proponents, the contractors and the regulatory agencies to implement the project and follow-up actions defined.

9.2 Environmental Management Action Plan

All project-related activities, their impacts on environment, mitigation measures for the impacts at different stages of project (construction Phase and operation Phase), and the agency responsible for implementing the mitigation measures have been presented in the **Table 9.1.**

Table 60: Environmental Management Action Plan

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
A.	**Project Preparation Phase**				
A.1.	Preparation of Detailed Project Report	Land	No impact		
		Water	No impact		
		Air	No impact		
		Noise	No impact		
		Biological	No impact		
		Socio-economic	No Impact		
		Solid Waste management	No Impact		
A.2.	Obtaining Environmental Clearance	ToR approval from MoEF was obtained on 23/01/2019. Public hearing will be conducted in each Districts.			
A.3.	Obtaining Tree Cutting Permission	Trees to be cut within the existing RoW of the project road has been marked through a joint inspection carried out with StateForest Department.			
A.4.	Obtaining Consent to establish	Once final environmental clearance is obtained the application for consent to establish the project will be submitted to UttarPradesh Pollution Control Board (UPPCB).			
B.	**Pre-Construction Phase**				
B.1.	Land Acquisition	Land	No impact	-	-
		Water	No impact	-	-
		Air	No impact	-	-
		Noise	No impact	-	-
		Biological	No impact	-	-
		Socio-economic	Loss of land, buildings and livelihood, loss of cultural properties and common property resources (CPRs)	The land acquisition will be undertaken in accordance with the RAP and entitlement framework. All R&R activities including payment of compensation to PAPs shall be completed before starting the construction. Land must be provided to the concessionaire free of any encumbrances.	State Govt. and Project Proponent

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				All the cultural properties and common property resources being impacted due to the project should berelocated with prior approval of the concerned community / Departments/Agencies before starting the construction.	
		Solid waste management	No impact	-	-
B.2.	Relocation of utilities	Land	No impact	-	-
		Water	No impact	-	-
		Air	No impact	-	-
		Noise	No impact	-	-
		Biological	No impact	-	-
		Socio-economic	Damages to utilities and inconvenience to public	Make sure that all the utilities being impacted due to the project are relocated by the concerned Departments / Agencies before starting the construction.	EPC Contractor
		Solid Waste Management	No impact	-	-
B.3.	Identification of site for construction camp	Land	Loss of topsoil, soil contamination due to spillage of fuel, lubricants and hazardous chemicals	Locate the camp on nonagricultural lands/ waste lands. Detailed site selection criteria should be followed and details of identified sites should be reported to the Construction Supervision Consultant (CSC) for approval Written permission from the land owner is to be obtained if the land is taken on lease.	EPC Contractor
		Water	Surface water pollution due to run off from the site containing oil and silt, and waste water from vehicle washing area and sewage from toilets.	Locate the camp at a minimum distance of 200m from any surface water body. Consent to Establish the construction camp should be obtained from the SPCB under Water (Prevention and Control of Pollution) Act, 1974	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Air	Air pollution due to fugitive dust and gaseous emissions from hot mix plant and diesel generator.	Locate the camp at a min. distance of 500 mts. in downwind direction of any major settlement or village. Consent to Establish the construction camp should be obtained from the SPCB under Air (Prevention and Control of Pollution) Act, 1981.	EPC Contractor
		Noise	Noise pollution due to generator, machineries and movement of vehicles	Locate the camp at a min. distance of 500 mts. away from any major settlement or village in downwind direction.	EPC Contractor
		Biological	Loss of trees, Impact on forests and wildlife habitats	Record the number of trees to be cut and make provision in the Construction Camp Management and Redevelopment Plan to plant three times the number of trees to be cut. Locate the camp at a min. distance of 500 mts. away from forests / wildlife habitats / mangroves / ecologically sensitive areas. .	EPC Contractor
		Socio-economic	Inconvenience to local traffic in access roads to construction camp	Select camp site with sufficiently wide access roads for heavy vehicle movement without inconvenience to local traffic.	EPC Contractor
		Solid waste management	No impact	-	-
B.4.	Identification of site for labour camps	Land	Loss of top soil and soil productivity due to soil compaction	As far as possible locate the camp on nonagricultural or barren lands and details of identified sites should be reported to the CSC for approval. Written permission from the land owner is to be obtained if the land is taken on lease. Labour Camp Management and Redevelopment Plan should be prepared submitted to CSC for approval.	EPC Contractor
		Water	Unsafe disposal of domestic sewage to nearest water body.	Locate the camp at a minimum distance of 200m from any surface water body.	EPC Contractor
		Air	Negligible impact	-	-
		Noise	Negligible impact	-	-

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Biological	Cutting of trees / collection of fire wood and non-timber forest produce (NTFP) from forest, hunting of wild animals, occurrence of forest fire.	Record the number of trees to be cut and make provision in the Labour Camp Management and Redevelopment Plan to plant three times the number of trees to be cut. Locate the camp at a min. distance of 500 mts. away from forests / wildlife habitats / mangroves / ecologically sensitive areas.	EPC Contractor
		Socio-economic	Impact on Public health and law and order	Obtain permission from local governing body before setting up the camp as per the guidelines for management of labour camps.	EPC Contractor
		Solid waste management	No Impact	-	-
B.5.	Identification of site for quarrying and stone crushing operations	Land	Loss of productive land, destabilization of slopes due to modification of natural conditions	Nonagricultural or waste lands should be selected for siting quarries and crushers. Quarrying in unstable hill slopes should be avoided. Identified sites should be reported to the CSC for approval Written permission from the land owner is to be obtained if the land is taken on lease. Quarry and Crusher Management and Redevelopment Plan should be prepared and get it approved by CSC. Clearance should be obtained from Mining and Geology Department for Quarry and crusher	EPC Contractor
		Water	Surface water pollution due to run off from the site	Stone quarry shall be located at a minimum distance of 50 meters from any water body.	EPC Contractor
		Air	Increased air pollution due to fugitive dust	Quarry site shall be located at a minimum distance of: 500 meters from any inhabited site, Railway line, National Highway, State Highway or Major District Road. The minimum distance between two stone crushers should be 1 km to avoid dust pollution influence of one over the other.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Consent to Establish the Crusher should be obtained from SPCB under Air (Prevention and Control of Pollution) Act, 1981	
		Noise	Increase in noise levels	Quarry site shall be located at a minimum distance of 500 meters from any inhabited site.	EPC Contractor
		Biological	Loss of trees, Impact on forests and wildlife habitats	Record the number of trees to be cut and make provision in the Quarry Management and Redevelopment Plan to plant three times the number of trees to be cut. Locate the quarry and crusher at a min. distance of 500 mts. away from forests / wildlife habitats / mangroves / ecologically sensitive areas.	EPC Contractor
		Socio-economic	Risk for local inhabitants and passengers through nearby roads, railways, ropeways and waterways. Inconvenience to local traffic in access roads to quarry and crusher	Quarry site shall be located at a minimum distance of: (i) 500 meters from any inhabited site (ii) 500 m from National Highways, State Highways and Major District Roads, railways, ropeways and waterways Select quarry and crusher site with sufficiently wide access roads for heavy vehicle movement without inconvenience to local traffic. Following licenses should be obtained. (i) License from Petroleum and Explosive Safety Organization for storage of explosives for quarry (ii) License from Revenue Authorities for Quarry (iii) License from Gram Panchayath for Quarry and Crusher	EPC Contractor
		Solid waste management	Impacts due to improper disposal of overburden from quarry site.	Site for overburden disposal should be planned within the quarry site or any other appropriate site. QuarryManagement and Redevelopment Plan should address the disposal of overburden.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
B.6.	Identification of borrow sites	Land	Loss of productive land, loss of top soil, soil erosion, alterations in local topography, flooding of land due to collapse of river bund / irrigation tank bund.	Borrow site shall be selected preferably from barren, infertile lands and located at a minimum distance of: (i) 30m away from the toe of the embankment alongroad side. (ii) located not less than 30m from the toe of the bankalong the river side or irrigation tank bund (iii) at least 500 m from villages and settlements Details of identified sites should be reported to theCSC for approval Written permission from the land owner is to be obtained if the land is taken on lease. Borrow Area Management and Redevelopment Plan should be prepared and get approved by CSC.	EPC Contractor
		Water	Collapse of irrigation tank bund and loss of irrigation water.	Borrow area should be located at a minimum distance of 30m from the toe of the irrigation tank bund.	EPC Contractor
		Air	Increased air pollution due to fugitive dust	Borrow site shall be located at a minimum distance of 500 m in down-wind direction of villages and settlements.	EPC Contractor
		Noise	Increase in noise levels	Borrow site shall be located at a minimum distance of 500 m in down-wind direction of villages and settlements.	EPC Contractor
		Biological	Loss of trees, Impact on forests and wildlife habitats	Record the number of trees to be cut in the borrow area and make provision in the Borrow Area Management and Redevelopment Plan to plant three times the number of trees to be cut. Locate the borrow area at a min. distance of 500 mts. away from forests / wildlife habitats / mangroves / ecologically sensitive areas	EPC Contractor
		Socio-economic	Inconvenience to local traffic in access roads to borrow area,Occurrence of water borne diseases	Select borrow site with sufficiently wide access roads for heavy vehicle movement without inconvenience to local traffic.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
			due to accumulation of water in borrowed lands.	Borrow Area Management and Redevelopment Plan should address the water logging issue.	
		Solid waste management	No impact	-	-
B.7.	Identification of water sources	Land	No impact	-	-
		Water	Ground water depletion	Only surface water should be used for construction and dust suppression. Possibility of using treated industrial water for dust suppression should be explored. Suggested locations of water sources and details of identified water sources should be submitted to CSC for approval. Water for domestic use should be sourced from municipal water supply or from approved water suppliers. Permission from relevant state authority (PWD / Irrigation dept.) should be obtained for surface water extraction.	EPC Contractor
		Air	No impact	-	-
		Noise	No impact	-	-
		Biological	No impact	-	-
		Socio-economic	Reduction in water available for agriculture and domestic purposes	Extraction of water from public water supply schemes, community spring water sources, community hand pumps, and community wells should be avoided. Local community should be consulted (with respect to the quantity of water, time and duration of withdrawal) before finalizing the surface water sources.	EPC Contractor
		Solid Waste Management	No impact	-	-
B.8.	Identification of site for debris /	Land	Loss of soil productivity, soil contamination, soil erosion	Select barren / degraded land. Productive lands should be avoided as far as possible. Since the filling is than cutting no excess soil will be there for disposal	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
	excess soil disposal	Water	Surface water pollution due to run off from the debris and soil	Debris disposal site should be at least 200 m away from surface water bodies.	EPC Contractor
		Air	Air pollution due to fugitive dust during dumping of debris and soil	No residential areas should be located within 100 m downwind side of the debris disposal site.	EPC Contractor
		Noise	Noise pollution due to movement of vehicles and dumping of debris.	No residential areas should be located within 100 m downwind side of the debris disposal site.	EPC Contractor
		Biological	Loss of vegetative cover, impact on wildlife habitats	Where ever possible, locate the site on waste lands. Site to be located at least 500 m away from wildlife habitats / Mangroves / Ecologically sensitive areas.	EPC Contractor
		Socio-economic	Obstruction to movement of local inhabitants, affect the safety and aesthetical beauty of the locality.	Public perception about the location of debris disposal site should be obtained before finalizing the location.	EPC Contractor
		Solid waste management	No impact	-	-
C.	Construction Phase				
C.1.	Site Preparation Activities				
C.1.1.	Setting up of construction camp	Land	Soil contamination due to spillage of fuel and lubricants, soil erosion due to surface run off.	Topsoil conservation to be carried out as per guidelines. Concrete flooring and oil interceptors should be proposed for hot mix plant area and work shop, vehicle washing and fuel handling area in construction camps. Measures as per IRC: 90 – 2010 “Guidelines of Selection, Operation and Maintenance of Bituminous Hot Mix Plant” should be adopted. Sedimentation trenches should be made along the storm water drain to control soil erosion due to surface run off.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Proper maintenance of vehicles and machineries should be carried out to minimize the spillage of oil. Provision should be made for storage of used oil. Authorization should be obtained from the SPCB under Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 for collection, storage and disposal of hazardous wastes. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Once the camp is setup, it should be entered in theregister of sites Compliance Report on Setting up of Construction Camp should be submitted to CSC for approval prior to commencing operation.	
		Water	Contamination of water due to spillage of oil and lubricants and surface runoff with sediments from construction camps. Contamination of water due to sewage from construction camps	Concrete flooring and oil interceptors should be provided for hot mix plant area and work shop, vehicle washing and fuel handling area in construction camps Sedimentation trenches should be made along the storm water drain to catch the sediments in surface runoff. Toilets, sewage collection system and septic tanks should be proposed in construction camps. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Consent to operate the construction camp should be obtained from SPCB under Water (Prevention and Control of Pollution) Act, 1974 before starting the operation.	EPC Contractor
		Air	Air pollution due to fugitive dust and gaseous emissions from hot mix plant and diesel generator	Arrangements should be made for regular sprinkling of water for dust suppression. All the vehicles should have Pollution under Control certificate. Stack height and emission level of hot mix plant and diesel generator should meet the relevant	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				SPCB guidelines. Hot mix plants should have the latest, advanced pollution control measures available in the country. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Consent to operate the construction camp should be obtained from SPCB under Air (Prevention and Control of Pollution) Act, 1981 before starting the operation.	
		Noise	Increase in noise level due to diesel generator, other machineries and vehicles	Diesel generator should have noise control measures to meet the noise standards set by Central Pollution Control Board (75 dB(A) at 1 m from the enclosure surface for generators with integral acoustic enclosure. Acoustic enclosure for generators without integral acoustic enclosure shall be designed for minimum 25 dB(A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side at 0.5 m from the enclosure). Noise level of vehicles used for construction activities should meet the noise standards set by Central Pollution Control Board (maximum 80 dB(A)). Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Biological	Loss of vegetation	Green belt development along the camp boundary should be undertaken. No. of trees planted should notbe less than three times the number of trees cut. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Socio-economic	Occupational health and safety impacts for workers	Safe drinking water and sanitation facilities should be made available to the construction workers. Personal protective equipments such as ear plugs, helmets, goggles, gloves etc. should be made available to the construction workers.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Firefighting equipments like fire extinguishers shall be provided in the camp as per fire safety standards. Fencing should be provided for the camp to prevent trespassing of humans and animals into the camp. Operation manuals and training should be provided to machine operators. Warning signs should be placed at accident prone areas. Other provisions to ensure worker's safety shall be followed as per guidelines. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	
		Solid Waste management	Unscientific disposal of debris / solid waste	Debris / solid waste should be disposed in debris disposal site approved by CSC. Guidelines for management of debris disposal given in should be followed.	EPC Contractor
C.1.2.	Setting up of labour camp	Land	Loss of soil productivity	Topsoil conservation to be undertaken as per guidelines. Labour Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Once the camp is setup, it should be entered in theregister of sites. Compliance Report on Setting up of Labour Camp should be submitted to CSC for approval prior to commencing operation of the camp.	EPC Contractor
		Water	Pollution of water bodies with sewage	Toilets, sewage collection system and septic tanks should be provided in labour camp. Labour Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Air	No impact	-	-
		Noise	No impact	-	-
		Biological	Loss of vegetation	Green belt development along the camp boundary should be undertaken.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				No. of trees planted should not be less than three timesthe number of trees cut.	
			Deforestation	LPG should be provided for cooking to avoid firewood collection from forest. Labour Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Socio-economic	Health impact due to fire accidents, Increase in communicable diseases	Labour camps should not be constructed with inflammable materials. Fire safety standards should be followed in camp construction. Firefighting equipments like fire extinguishers shallbe provided in the camp as per fire safety standards. Worker's safety shall be ensured as per guidelines. Safe drinking water, toilets, sewage collection system and septic tanks should be provided in labour camp. Labour Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Solid Waste managemen t	Unhygienic environment due to unsafe disposal of waste generated.	Provision of adequate space for segregated waste collection and waste handling. Provision of separate waste bins for bio-degradable, non-degradable and domestic hazardous waste.	EPC Contractor
C.1.3.	Setting up of Quarry and Crusher	Land	Loss of top soil	Topsoil conservation should be undertaken as per guidelines. Quarry and Crusher Management and Redevelopment Plan approved by the CSC should be strictly followed. Once the quarry and crusher is setup, it should be entered in the register of sites. Compliance Report on Setting up of Quarry and Crusher should be submitted to CSC for approval prior to commencing operation of the quarry and crusher.	EPC Contractor
		Water	Surface water pollution due to run off with sediments from the site	Contour trenches should be made around the quarry and crusher to catch the sediments in surface run off.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Quarry and Crusher Management and Redevelopment Plan approved by the CSC should be strictly followed.	
		Air	Air pollution due to fugitive dust and emissions from diesel generator	All dust producing units should be housed in a building with suitable roofing and flooring. Dust extraction unit with a collection system should be provided in the crusher unit and all transfer points. Stack height and emission level of diesel generator should meet the relevant SPCB guidelines. Water sprinkling arrangements for dust suppression at the crusher and access roads should be provided. Roads inside the crusher premises should be paved. Green belt development along the crusher site boundary should be undertaken. Consent to operate the crusher unit should be obtained from SPCB under Air (Prevention and Control ofPollution) Act, 1981 before starting the operation. Quarry Area and Crusher Unit Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Noise	Noise pollution due to Crusher	All noise producing units should be housed in a building with wall of minimum 23 cm thickness and with suitable roofing and flooring.	EPC Contractor
		Biological	Loss of vegetation	Green belt should be developed along the boundary of crusher site. Number of trees planted should not beless than three times the number of trees cut.	EPC Contractor
		Socio-economic	Occupational health and safety impacts for workers, Risk for local inhabitants and passengers through nearby roads, railways, ropeways and waterways.	Safe drinking water and sanitation facilities should be provided for the construction workers. Personal protective equipments such as ear plugs, helmets, goggles, gloves etc. should be made available to the construction workers. Fencing should be provided for the quarry and crusher to prevent trespassing of humans and animals into thearea.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Blasting timings in quarry should be fixed avoiding the rush hours. Warning sign boards regarding blasting timings in quarry should be displayed at appropriate locations to inform public. Warning siren should be provided to inform the public and workers before blasting. Training should be provided to workers regarding safe operation procedures Quarry and Crusher Management and Redevelopment Plan approved by the CSC should be strictly followed.	
		Solid Waste Management	No impact	-	-
C.1.4.	Setting up of borrow area	Land	Loss of topsoil, soil erosion	Topsoil conservation to be undertaken as per guidelines. Contour trenches should be made along the borrow area boundary considering the topography to prevent soil erosion. Borrow Area Management and Redevelopment Plan approved by CSC should be strictly followed. Once the borrow area is setup, it should be entered in the register of sites. Compliance Report on Setting up of borrow area should be submitted to CSC for approval prior to commencing operation of the borrow area.	EPC Contractor
		Water	Pollution of water bodies due to surface run off.	Contour trenches should be made along the borrow area boundary considering the topography to catch the sediments from surface runoff. Borrow Area Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Air	Air pollution due to fugitive dust.	Arrangements should be made for sprinkling of water for dust suppression. Borrow Area Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Noise	No impact	-	-
		Biological	Loss of trees	Three times the number of trees cut should be planted. Borrow Area Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Socio-economic	Risk for local inhabitants due to trespassing	Fencing should be provided for the borrow area to prevent trespassing of humans and animals into the area.	EPC Contractor
		Solid Waste Management	No impact	-	-
C.1.5.	Preparation of debris disposal site	Land	Loss of productive land, erosion of disposed soil	If the site is located in productive land, topsoil conservation should be undertaken as per guidelines. Contour trenches should be made along the debris disposal site boundary considering the topography to prevent soil erosion. Debris disposal site Management and Redevelopment Plan approved by CSC should be strictly followed. Once the camp is setup, it should be entered in the register of sites. Compliance Report on Setting up of debris disposal site should be submitted to CSC for approval prior to commencing operation of the site.	EPC Contractor
		Water	Surface water pollution due to run off from the site	Contour trenches should be made along the debris disposal site boundary considering the topography to catch the sediments in runoff.	EPC Contractor
		Air	No impact	-	-
		Noise	No impact	-	-
		Biological	Loss of trees	Three times the number of trees cut should be planted. Debris Disposal Site Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Socio-economic	Risk for local inhabitants due to trespassing	Fencing should be provided for the debris disposal site to prevent trespassing of humans and animals into the area.	EPC Contractor
		Solid waste management	No impact	-	-
C.1.6.	Clearing, Grubbing and Stripping	Land	Destabilization of slopes, soil erosion.	Avenue plantation to be undertaken as per IRC: SP 21-2009 "Guidelines on Landscaping and Tree Plantation" to compensate for the lost trees. No. of trees planted should not be less than three timesthe no. of trees cut.	EPC Contractor
		Water	No impact	-	-
		Air	Change in micro climate	Avenue plantation to be undertaken as per IRC: SP 21-2009 "Tree Plantation and Landscaping"to compensate for the lost trees. No. of trees planted should be more than three timesthe number of trees cut. Landscaping shall be undertaken at embankments and junctions to enhance the microclimate.	EPC Contractor
		Noise	Increase in noise levels	Avenue plantation to be undertaken as per IRC: SP 21-2009 "Guidelines on Landscaping and Tree Plantation" to compensate for the lost trees. No. of trees planted should be more than three times the number of trees cut.	EPC Contractor
		Biological	Loss of vegetative cover and impact on fauna	Trees shall be removed in phases. Small trees shall be transplanted wherever possible to minimize the impacts of loss of trees. Areas of tree plantation cleared will be replaced according to Compensatory Afforestation Policy under Forest Conservation Act - 1980.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				The compensatory avenue plantation shall be taken up at the onset of monsoon season as per IRC: SP 21-2009 "Guidelines on Landscaping and Tree Plantation" and in consultation with the State Forest Department. No. of trees planted should be more than three times the no. of trees cut. The plants shall be provided with adequate protection from animals and proper monitoring shall be carried out to ensure their survival and growth. Landscaping shall be done with a lag of 3 to 4 months from the start of the work on any section. The section shall be deemed to be completed when the landscaping is over.	
		Socio-economic	Loss of tree shade. Safety of pedestrians and passersby.	The compensatory avenue plantation shall be carried out as per IRC: SP 21-2009 "Guidelines on Landscaping and Tree Plantation". Provide adequate signage and cordon off the area so as to ensure the safety of the pedestrians and passersby.	EPC Contractor
		Solid waste management	Unscientific / unsafe disposal of tree waste	Tree wastes should not be burned.	EPC Contractor
C.1.7.	Cutting of Earth	Land	Loss of topsoil, water logging due to alterations in natural drainage patterns.	Topsoil conservation to be undertaken as per guidelines. Avoid dumping of earth into canals, drainage channels and water bodies. As far as possible avoid construction activity during monsoon.	EPC Contractor
		Water	Blocking of cross drainage and water logging, contaminating water bodies	Ensure compliance with design measures as per the drawings. Avoid dumping of earth into canals, drainage channels and water bodies.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Air	Increased air pollution due to fugitive dust/ emissions.	Sprinkling of water on site for dust suppression.	EPC Contractor
		Noise	Increase in noise levels	Near sensitive receptors use temporary noise barriers and avoid work at night. For cutting of rocks, instead of mechanical blasting, rock cutting process shall be carried out to reduce the noise pollution.	EPC Contractor
		Biological	No impact	-	-
		Socio-economic	No impact	-	-
		Solid waste management	Unscientific/ unsafe disposal of over burden	Over burden to be disposed off in the sites identified.	EPC Contractor
C.1.8.	Filling	Land	Loss of topsoil, alteration of natural drainage patterns.	Topsoil conservation to be undertaken as per guidelines. As far as possible, maintain the natural drainage pattern undisturbed.	EPC Contractor
		Water	Diversion of natural surface water flows, alterations/blocking of cross drainage and water logging.	Ensure compliance with design measures as per the drawings. Earth, stone or any other construction material shall be properly disposed off safely so that the flow of water in cross drainage channels is not blocked.	EPC Contractor
		Air	Increased air pollution due to fugitive dust / emissions.	Sprinkling of water on site for dust suppression.	EPC Contractor
		Noise	Increase in noise levels	At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10:00 pm and 6:00 am. Use temporary noise barriers near sensitive receptors.	EPC Contractor
		Biological	No impact	-	-

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Socio-economic	Flooding of adjacent low lying land	Ensure compliance with design measures as per the drawings.	EPC Contractor
		Solid waste management	No impact	-	-
C.1.9.	Stripping	Land	Loss of topsoil, removal of vegetation.	Topsoil conservation to be undertaken as per guidelines.	EPC Contractor
		Water	Pollution of water bodies due to irresponsible handling of stripped earth.	Stripped earth shall be conserved for reuse Care needs to be taken to avoid dumping of earth in drainage channels.	EPC Contractor
		Air	Increased air pollution	Sprinkling of water on site for dust suppression.	EPC Contractor
		Noise	Increase in noise levels	Near sensitive receptors use temporary noise barriers.	EPC Contractor
		Biological	No impact	-	-
		Socio-economic	No impact	-	-
		Solid waste management	No impact	-	EPC Contractor
C.1.10.	Demolition	Land	No impact	-	-
		Water	No impact	-	-
		Air	Increased air pollution due to fugitive dust	Sprinkling of water on site for dust suppression.	EPC Contractor
		Noise	Increase in noise levels due to demolition activity	Near sensitive receptors use temporary noise barriers and avoid work at night.	EPC Contractor
		Biological	No impact	-	-
		Socio-economic	No impact	-	-
		Solid waste management	Unscientific / unsafe disposal of debris	Debris to be disposed off in the sites identified for the same as per guidelines.	EPC Contractor
D.2.	Construction Activities				
D.2.1.	Operation of construction camp	Land	Complete elimination of productive capacity of soil, spillage of fuel, lubricants and hazardous chemicals.	Proper maintenance of vehicles and machineries should be carried out to minimize the spillage of oil. Oil and grease waste generated from garages in construction camps should be drained out through catch drains and oil interceptors.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Sanitation facilities, storm water drainage, catch drains and oil interceptors should be maintained properly. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Details of hot mix plant and machineries in operation should be reported to CSC	
		Water	Surface water pollution due to run off and waste water / sewage disposal from the camps.	Sanitation facilities, storm water drainage, catch drains and oil interceptors should be maintained properly. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Water quality monitoring should be conducted as per Environmental Monitoring Plan so that appropriate measures are taken up towards abatement of pollution.	EPC Contractor
		Air	Increase in air pollution due to operation of machineries.	PUC certificates of all machineries should be renewed at required intervals. Water sprinkling should be undertaken for dust suppression. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Air quality monitoring should be conducted as per Environmental Monitoring Plan so that appropriate measures are taken up towards abatement of pollution.	EPC Contractor
		Noise	Increase in noise level due to operation of machineries.	Diesel generators and vehicles used for construction activities should be maintained well to ensure that thenoise levels continue to be within the noise standards set by Central Pollution Control Board (Maximum 80 dB(A)).	-

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				At construction camps within 150 m of human settlements, noisy construction should be stoppedbetween 10:00 pm and 6:00 am. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed. Noise level monitoring should be conducted as per Environmental Monitoring Plan.	
		Biological	Loss of vegetation	Saplings planted for green belt development should be properly taken care of and protected to ensuretheir survival and growth.	-
		Socio-economic	Occupational health and safety impacts for workers	Provision of safe drinking water and access to sanitation services should be continued at satisfactory service levels. Construction workers should use the personal protective equipment's provided to them and it shall be replaced if necessary. Firefighting equipment's like fire extinguishers provided in the camp should be maintained well. Fencing of the camp to prevent trespassing of humans and animals into the camp should be maintained properly. Other provisions to ensure worker's safety should be followed. On occurrence of any accident or injury, the safety officer should submit an accidentreport to the CSC Follow guidelines to ensure safety in storage and handling of hazardous substances. Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Solid waste management	Unscientific / unsafe disposal of debris / waste	Collected oil and grease should be reused or sold out to approved oil recycling agencies. Debris / solid waste should be disposed in debris disposal site approved by CSC. Stone crusher dust and plastic wastes to the extent possible is proposed for use in expressway construction.	EPC Contractor
D.2.2.	Functioning of labour camp	Land	Contamination of soil due to waste water	Labour Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Water	Surface water pollution due to run off from the site	Toilets, sewage collection system and septic tanks provided in labour camp should be properly maintained. Labour Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Air	Air pollution due to burning of dry waste/ fire wood.	Waste bins should be provided for waste collection and safe disposal. LPG should be provided for cooking.	EPC Contractor
		Noise	No impact.	-	-
		Biological	Loss of trees, Impact on forests, spread of forest fire	Saplings planted for green belt development should be properly taken care of and protected to ensure their survival and growth. If the camp is located near the forest, orient the labourers to refrain from any activities involving spread of forest fire, poaching or NTFP collection.	EPC Contractor
		Socio-economic	Increase in communicable diseases Increase in crime rate Indulgence in hunting and collection of forest produces.	Toilets, sewage collection system and septic tanks provided in labour camp should be properly maintained. To the extent possible local people should be included in the labour force. Information dissemination should be undertaken to generate awareness among migrant labourers about the sensitivities of the region.	EPC Contractor

			Collection of firewood if camp is near the forest Chances of forest fires	Senitisation of labourers should be undertaken to refrain them from collecting fire wood or any other NTFPs from nearby forests, (if any).	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				LPG should be provided for cooking and use of fire wood for cooking or any other purpose should be strictly banned.	
			Occurrence of accidents	Firefighting equipments like fire extinguishers provided in the camp should be maintained well. Fencing of the camp to prevent trespassing of humans and animals into the camp should be maintained properly. Other provisions to ensure worker's safety should be followed as per guidelines. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or injury, the safety officer should submit an accident report to the CSC.	EPC Contractor
		Solid waste management	Unhygienic environment due to unsafe disposal of solid waste generated.	Periodical maintenance of waste handling space should be undertaken. Provision of separate waste bins for bio-degradable, non-degradable and domestic hazardous waste shouldbe continued. Disposal of collected waste in nearest approved landfill site or identified debris disposal site should be undertaken.	EPC Contractor
D.2.3.	Quarrying and operation of crushers	Land	Loss of soil productivity, soil contamination	To avoid spillage of fuel and lubricants, the vehicles and equipment shall be properly maintained and repaired. Maintenance should be carried out on impervious platforms with spill collection provisions. Quarry Area and Crushing Unit Management and Redevelopment Plan approved by the CSC should be strictly followed.	EPC Contractor
		Water	Surface water pollution due to run off from the site	To avoid spillage of fuel and lubricants, the vehicles and equipment should be properly maintained and repaired. Maintenance should be carried out on impervious platforms with spill collection provisions.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Quarry Area and Crushing Unit Management and Redevelopment Plan approved by the CSC should be strictly followed. Water quality monitoring shall be conducted as per Environmental Monitoring Plan to detect any contamination or spillage.	
		Air	Air pollution due to fugitive dust.	Sprinkling of water on site for dust suppression should be undertaken. Provide sufficient water storage facility for 2 days use. Roads inside the crusher premises should be tarred or concreted. Air quality monitoring should be conducted as per Environmental Monitoring Plan to detect air pollution.	EPC Contractor
		Noise	Noise pollution due to stone blasting	Adopt controlled blasting techniques. Conduct quarrying in a skillful, scientific and systematic manner. Follow a routine and preventive maintenance procedure for the DG set in consultation with the DG set manufacturer. The stack height of the DG set has to be adequate. Workers shall not be exposed to sound of more than 85 – 90 DB for more than eight hours a day and shall be provided with ear plugs. Quarry Area and Crushing Unit Management and Redevelopment Plan approved by the CSC should be strictly followed. Noise quality monitoring shall be conducted as per Environmental Monitoring Plan to detect noise pollution.	EPC Contractor
		Biological	No impact	-	-

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Socio-economic	Safety of labourers	Adopt controlled blasting techniques. Conduct quarrying in a skillful, scientific and systematic manner. Provision of personal protective equipments to labourers. Other provisions to ensure worker's safety shall be followed as per guidelines. Follow guidelines to ensure safety in storage and handling of hazardous substances. On occurrence of any accident or injury, the safety officer should submit an accident report to the CSC.	EPC Contractor
		Solid waste management	No impact	-	-
D.2.4.	Borrowing of earth	Land	Loss of fertile lands, loss of topsoil, soil contamination, removal ofvegetation, soil erosion, destabilization of slopes due to modification of natural conditions.	Borrow Area Management and Redevelopment Plan approved by the CSC should be strictly followed in undertaking borrowing of earth. Details of earthwork in borrow site to be reported to CSC.	EPC Contractor
		Water	Alterations in local drainage pattern, diversion of natural surface water flows, blocking of cross drainage and water logging.	Natural drainage patterns should not be altered or blocked. Borrow Area Management and Redevelopment Plan approved by the CSC should bestrictly followed in undertaking borrowing of earth.	EPC Contractor
		Air	Increased air pollution due to fugitive dust	Sprinkling of water on site for dust suppression should be undertaken.	EPC Contractor
		Noise	Increase in noise levels	Workers should not be exposed to sound of more than 85 – 90 DB for more than eight hours a day and shall be provided with ear plugs.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Noise level of vehicles used for construction activities should meet the noise standards set by Central Pollution Control Board (maximum 80 dB(A)) Construction Camp Management and Redevelopment Plan approved by the CSC should be strictly followed.	
		Biological	No impact	-	
		Socio-economic	Occupational health and safety impacts	Workers shall be provided with personal protective equipments such as ear plugs, helmets, goggles, glovesetc. Other provisions to ensure worker's safety shall be followed as per guidelines. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or injury, the safety officer should submit an accidentreport to the CSC.	EPC Contractor EPC Contractor
		Solid waste management	No impact	-	-
D.2.5.	Extraction of Surface water	Land	No impact	-	-
		Water	Over exploitation of surface water	Water should be drawn from only those sources that have got prior approval of CSC.	EPC Contractor
		Air	No impact	-	-
		Noise	No impact	-	-
		Biological	Impact on fauna in lakes and rivers	Over extraction of surface water should be avoided.	EPC Contractor
		Socio-economic	Reduction in water available for agriculture and domestic purposes	Over extraction of surface water should be avoided.	EPC Contractor
		Solid waste	No impact	-	-
D.2.6.	Transportation of materials	Land	Spillage of fuel, lubricantsand hazardous chemicals.	Vehicles and machinery are maintained and refilled in such a fashion that fuel spillage does not contaminatethe soil. Fuel storage and refilling sites shall be kept away from cross drainage structures and important water bodies.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Soil quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination.	
			Damage of haul road due to over usage.	Black topping of haul roads and their maintenance regularly for easy plying of construction vehicles aswell as the regular local commuters.	EPC Contractor
		Water	Contamination of water due to washing of vehicles, constructionequipments and machineries	Avoid washing of vehicles, construction equipments and machineries near/inside the water bodies along the project stretch.	EPC Contractor
		Air	Increased air pollution due to fugitive dust	Black topping of unpaved haul roads. Dust covers/ tarpaulins shall be provided to cover construction material loaded on trucks. Idling of delivery trucks or other equipment shall not be permitted during periods of unloading or when they are not in active. Sprinkling of water shall be carried out along the haul road at least twice a day on a regular basis during the entire construction period especially in the winter and summer seasons. All vehicles should have PUC certificates.	EPC Contractor
		Noise	Increase in noise levels	Where ever the haul road is passing within 150 mts of human settlements, the transportation of material shallbe stopped during night time (between 10:00 pm and 6:00 am.).	EPC Contractor
		Biological	No impact	-	-
		Socio-economic	Inconvenience to local travelers. Increase in accidents	Black top the road and maintain it regularly Provide adequate traffic safety measures.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Solid waste management	No impact	-	-
D.2.7.	Scarifying of existing bituminous layer	Land	No impact	-	-
		Water	No impact	-	-
		Air	No impact		
		Noise	No impact		
		Biological	No impact	-	-
		Socio-economic	Health impact on workers due to air and noise pollution	Workers shall be provided with personal protective equipments such as ear plugs, helmets, goggles, gloves etc. Other provisions to ensure worker's safety shall be followed as per guidelines.	EPC Contractor
			Disruption of Traffic	Traffic Management Plan shall be prepared based on guidelines. Diversion roads to be paved, adequate traffic safety measures to be adopted and reported to CSC.	EPC Contractor
		Solid waste management	Unscientific/unsafe disposal of debris / waste	Scarified material should be used to maintain the haul roads and for construction of new roads. It shall also be recycled using separate machinery. Scarified material shall not be disposed off irresponsibly anywhere.	EPC Contractor
D.2.8.	Compacting earth and laying of sub-base course	Land	No impact	Soil quality monitoring shall be conducted as per Environmental Monitoring Plan so that appropriate measures are taken up towards abatement of pollution	-
		Water	No impact	Water quality monitoring shall be conducted as per Environmental Monitoring Plan so that appropriate measures are taken up towards abatement of pollution.	-

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Air	Increased air pollution	Sprinkling of water on site for dust suppression. All vehicles, equipment and machinery used for construction shall be regularly maintained to ensure that the emission levels are as per norms of PCB. The construction operations during nights, especially in the winter season shall be carried out under restricted conditions. Air quality monitoring shall be conducted as per Environmental Monitoring Plan to detect any deterioration in air quality due to the construction activities.	EPC Contractor
		Noise	Increase in noise levels	Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight hour operation shift. For protection of construction workers, earplugs shall be provided to those working very close to the noise generating machinery. At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10:00 pm and 6:00 am Near sensitive receptors use temporary noise barriers and avoid work at night. Noise level monitoring shall be conducted as per Environmental Monitoring.	EPC Contractor
		Biological	No impact	-	-
		Socio-economic	Disruption of Traffic	Traffic Management Plan shall be prepared. Diversion roads to be paved, adequate traffic safety measures to be adopted and reported to CSC.	EPC Contractor
			Occurrence of accidents	Other provisions to ensure worker's safety shall be followed as per guidelines. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				injury, the safety officer should submit an accident report to the CSC.	
		Solid waste management	Utilization of fly ash	If the site is within 100 Km from thermal power plant permission under Fly Ash Notification, 2007, to be obtained from regional office of MoEF for using fly ash in the construction process.	EPC Contractor EPC Contractor
D.2.9.	Laying base course and surface course	Land	No Impact	Soil quality monitoring shall be conducted as per Environmental Monitoring Plan so that appropriate measures are taken up towards abatement of pollution.	EPC Contractor
		Water	No Impact	Water quality monitoring shall be conducted as per Environmental Monitoring Plan so that appropriate measures are taken up towards abatement of pollution.	EPC Contractor
		Air	Increased air pollution due to fugitive dust generation	Sprinkling of water on site for dust suppression. All equipment and machinery used for construction shall be regularly maintained to ensure that the emission levels are as per norms of PCB. Air quality monitoring shall be conducted as per Environmental Monitoring Plan to detect any deterioration in air quality due to the construction activities.	EPC Contractor
		Noise	Increase in noise levels	Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight-hour operation shift. For protection of construction workers, earplugs shall be provided to those working very close to the noise generating machinery. At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10:00 pm and 6:00 am. Near sensitive receptors use temporary noise barriers and avoid work at night.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Noise level monitoring shall be conducted as per Environmental Monitoring.	
		Biological	No impact	-	-
		Socio-economic	Disruption of Traffic	Traffic Management Plan shall be prepared Diversion roads to be paved, adequate traffic safety measures to be adopted and reported to CSC.	EPC Contractor
			Occurrence of accidents	Other provisions to ensure worker's safety shall be followed as per guidelines. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or injury, the safety officer should submit an accident report to the CSC.	EPC Contractor
		Solid waste management	No impact	-	-
D.2.10.	Construction of bridges, culverts	Land	Spillage of fuel, lubricants and hazardous chemicals	Machinery and equipments used in bridge and culvert construction are maintained and refilled in such a fashion that fuel spillage does not contaminate the soil. Fuel storage and refilling sites shall be kept away from cross drainage structures and important water bodies. All spills shall be disposed off as desired and the site shall be fully cleaned before handing over. Soil quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination.	EPC Contractor

		Water	Water pollution due to infusion of slurry into the water body during foundation construction. Impact on water quality due to remnants of construction materials.	Avoid foundation construction of bridges/ culverts during monsoon season. The foundation area should be separated from the other areas with an impervious barrier. This barrier will act as a settling tank for the solids and will prevent substantial increase in the turbidity of surrounding water. The sludge should be removed periodically and disposed off in the selected construction debris disposal sites. Remnants of construction material shall	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				be cleared/ disposed off before vacating the construction site. All construction operators, drivers and workshop personal to be trained well so that can take immediatemeasures for spill of contaminate. Water quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination.	
		Air	Increased air pollution	Sprinkling of water on site for dust suppression. The construction operations during nights, especially in the winter season shall be carried out under restricted conditions. All the equipment and machinery used for construction shall be regularly maintained to ensure that the emission levels are as per norms of PCB. Air quality monitoring shall be conducted as per Environmental Monitoring Plan to detect any deterioration in air quality due to the construction activities.	EPC Contractor
		Noise	Increase in noise levels	Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight-hour operation shift. For protection of construction workers, earplugs shall be provided to those working very close to the noise generating machinery. At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10:00 pm and 6:00 am. Near sensitive receptors use temporary noise barriers and avoid work at night. Noise level monitoring shall be conducted as per Environmental Monitoring.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Biological	Impact on aquatic biota due to disposal of construction material	Demolished old bridge shall be collected in scientific manner and disposed off safely into predetermined debris disposal site. Construction activity to be restricted during breeding period.	EPC Contractor
		Socio-economic	Disruption of Traffic	Traffic Management Plan shall be prepared.	EPC Contractor
			Occurrence of accidents	Other provisions to ensure worker's safety shall be followed as per guidelines. Follow guidelines to ensure safety in storage and handling of hazardous substances. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or injury, the safety officer should submit an accident report to the CSC.	EPC Contractor
		Solid waste management	Unscientific / unsafe disposal of debris	All spills and construction shall be disposed off in the sites identified for the same as per guidelines and the site shall be fully cleaned before handing over.	EPC Contractor
D.2.11.	Construction of flyovers, grade separators, ROBs.	Land	Spillage of fuel, lubricants and hazardous chemicals	Vehicles and machinery are maintained and refilled in such a fashion that fuel spillage does not contaminate the soil. Fuel storage and refilling sites shall be kept away from cross drainage structures and important water bodies. All spills shall be disposed off as desired and the site shall be fully cleaned before handing over. Soil quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination.	EPC Contractor
		Water	No impact	-	-
		Air	Increased air pollution	Sprinkling of water on site for dust suppression. The construction operations during nights, especially in the winter season shall be carried out under restricted conditions.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				All vehicles, equipment and machinery used for construction shall be regularly maintained to ensure that the emission levels are as per norms of PCB. Air quality monitoring shall be conducted as per Environmental Monitoring Plan to detect any deterioration in air quality due to the construction activities.	
		Noise	Increase in noise levels	Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight hour operation shift. At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10:00 pm and 6:00 am. Near sensitive receptors use temporary noise barriers and avoid work at night. Noise level monitoring shall be conducted as per Environmental Monitoring.	EPC Contractor
		Biological	No impact	-	-
		Socio-economic	Disruption of Traffic	Traffic Management Plan shall be prepared.	EPC Contractor
			Occurrence of accidents	Other provisions to ensure worker's safety shall be followed as per guidelines. Follow guidelines to ensure safety instorage and handling of hazardous substances. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or injury, the safety officer should submit an accident report to the CSC	EPC Contractor
		Solid waste management	Unscientific / unsafe disposal of debris	All spills and construction shall be disposed off in the sites identified for the same as per guidelines and the site shall be fully cleaned before handing over.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
D.2.12.	Construction of underpasses (pedestrian/cattle and animal)	Land	Contamination of soil due to spillage of oil, lubricants and hazardouschemicals	Machinery and equipments are maintained and refilled in such a fashion that fuel spillage does not contaminate soil. Soil quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination.	EPC Contractor
		Water	Contamination of water due to spillage and careless handling of oil and lubricants	Machinery and equipments are maintained and refilled in such a fashion that fuel spillage does not contaminate the water bodies. Fuel storage and refilling sites shall be kept away from cross drainage structures and important water bodies. All spills shall be disposed off as desired and the site shall be fully cleaned before handing over. Water quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination.	EPC Contractor
		Air	Increased air pollution	Sprinkling of water on site for dust suppression. The construction operations during nights, especially in the winter season shall be carried out under restricted conditions. All machinery and equipment used for construction shall be regularly maintained to ensure that the emission levels are as per norms of PCB. Air quality monitoring shall be conducted as per Environmental Monitoring Plan to detect any deterioration in air quality due to the construction activities.	EPC Contractor
		Noise	Increase in noise levels	Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight hour operation shift. The main noise producing sources such as the concrete mixers, generators, grader etc. shall be provided with noise shields around them.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10:00 pm and 6:00 am. Near sensitive receptors use temporary noise barriers and avoid work at night. Noise level monitoring shall be conducted as per Environmental Monitoring.	
		Biological	No impact	-	-
		Socio-economic	Disruption of Traffic	Traffic Management Plan shall be prepared.	EPC Contractor
			Occurrence of accidents	Other provisions to ensure worker's safety shall be followed as per guidelines. Follow guidelines to ensure safety in storage and handling of hazardous substances. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or injury, the safety officer should submit an accident report to the CSC.	EPC Contractor
		Solid waste management	Unscientific / unsafe disposal of debris	All spills and construction shall be disposed off in the sites identified for the same	EPC Contractor
D.2.13.	Construction of drains, utilities, RWH pits etc.	Land	Spillage of fuel, lubricants and hazardous chemicals	Machinery and equipments are maintained and refilled in such a fashion that fuel spillage does not contaminate the soil. Soil quality monitoring shall be conducted as per Environmental Monitoring Plan to ascertain level of contamination.	EPC Contractor
		Water	No Impact	-	-
		Air	Increased air pollution	Sprinkling of water on site for dust suppression. The construction operations during nights, especially in the winter season shall be carried out under restricted conditions.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				All equipment and machinery used for construction shall be regularly maintained to ensure that the emission levels are as per norms of PCB. Air quality monitoring shall be conducted as per Environmental Monitoring Plan to detect any deterioration in air quality due to the construction activities.	
		Noise	Increase in noise levels	Construction contract shall clearly specify the use of equipment emitting noise of not greater than 90 dB (A) for the eight hour operation shift. The main noise producing sources such as the concrete mixers, generators, grader etc. shall be provided with noise shields around them. At construction sites within 150 m of human settlements, noisy construction shall be stopped between 10:00 pm and 6:00 am. Near sensitive receptors use temporary noise barriers and avoid work at night. Noise level monitoring shall be conducted as per Environmental Monitoring.	EPC Contractor
		Biological	No impact	-	-
		Socio-economic	Occurrence of accidents	Other provisions to ensure worker's safety shall be followed as per guidelines. The safety checklist should be submitted to CSC at required intervals. On occurrence of any accident or injury, the safety officer should submit an accident report to the CSC.	EPC Contractor
		Solid wastemanagement	Unscientific / unsafe disposal of debris	All spills and construction shall be disposed off in the sites identified for the same as per guidelines and the site shall be fully cleaned before handing over.	EPC Contractor
D.2.14.	Debris disposal	Land	No impact	As far as possible, dispose debris on to interior unpaved road or the approach roads to strengthen it.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				It can also be used for filling of low-lying play grounds etc.	
		Water	Contamination of water source, rivers etc.	Provide proper drainage facility so that the site does not contaminate any water sources, rivers etc.	
		Air	No impact	-	-
		Noise	No impact	-	-
		Biological	No impact	-	-
		Socio-economic	No impact	-	-
		Solid waste management	No impact	-	-
D.2.15.	Roadside plantation and landscaping	Land	Beautification, vegetation cover, protects soil erosion	The compensatory avenue plantation shall be taken up at the onset of monsoon season as per IRC: SP 21-2009 "Guidelines on Landscaping and Tree Plantation" and in consultation with the State Forest Department.	EPC Contractor
		Water	Facilitates ground water recharge	-	-
		Air	Improvement in air quality	-	-
		Noise	Reduces noise pollution to adjacent areas.	-	-
		Biological	Increase in vegetation cover	-	-
		Socio-economic	Improved aesthetics	-	-
		Solid waste management	Unscientific / unsafe disposal of debris	Debris to be disposed off in the sites identified for the same.	EPC Contractor
E.	Post Construction Phase				
E.1.	Redevelopment of construction camp sites	Land	Rejuvenation of land	All spills shall be disposed off as desired and the site shall be fully cleaned before handing over. All measures envisaged in construction camp redevelopment plan approved by the SC shall be undertaken.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Water	Increased water recharge	Plantation along the boundary, erosion control measures, or slope stabilization measures shall be undertaken based on the activities envisaged in the redevelopment plan approved by the SC.	EPC Contractor
		Air	Improvement in air quality	Plantation along the boundary shall be undertaken based on the activities envisaged in the redevelopment plan approved by the SC.	-
		Noise	No impact	-	-
		Biological	Increased vegetation	Plantations along the boundary shall be undertaken.	EPC Contractor
		Socio-economic	No impact	-	-
		Solid waste management	No impact	-	-
E.2.	Redevelopment of quarry sites	Land	Rejuvenation of land	Plantation along the boundary, erosion control measures, or slope stabilization measures shall be undertaken based on the activities envisaged in quarry redevelopment plan approved by the SC.	EPC Contractor
		Water	Increased water recharge	Based on the quarry redevelopment plan approved by the SC necessary development activity like water recharging or developing it into a fishing pond shall be undertaken.	EPC Contractor
		Air	Improvement in air quality	Plantation along the boundary shall be undertaken based on the activities envisaged in quarry redevelopment plan approved by the SC	-
		Noise	No impact	-	
		Biological	Increased vegetation	Based on the quarry redevelopment plan approved by the SC necessary re-vegetation activities shall be undertaken.	EPC Contractor
		Socio-economic	Involvement of local Community and enhancement of their livelihood	Involve local community in the implementation of redevelopment plan.	EPC Contractor
		Solid waste management	No impact	-	-

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
E.3.	Redevelopment of borrow sites	Land	Rejuvenation of land	Undertake leveling or slope stabilization based on borrow redevelopment plan approved by the SC. Top soil reuse to be undertaken depending on the type of redevelopment envisaged in the plan. Status of borrow area redevelopment to be reported toCSC	EPC Contractor
		Water	Increased water recharge	Depending upon the type and form of rehabilitation to be adopted slope stabilization measures and small bund creations may be undertaken.	EPC Contractor
		Air	Improvement in air quality	-	-
		Noise	No impact	-	-
		Biological	Increased vegetation	Surplus trees after avenue plantation will be utilized for green belt development of exhausted borrow areas.	EPC Contractor
		Socio-economic	Involvement of local community and enhancement of their livelihood	Involve local community in the implementation of redevelopment plan.	EPC Contractor
		Solid waste management	No impact	-	-
E.4.	Redevelopment of labour camp sites	Land	Rejuvenation of land	All spills shall be disposed off as desired and the site shall be fully cleaned before handing over. All measures envisaged in construction camp redevelopment plan approved by the SC shall be undertaken.	EPC Contractor
		Water	Increased water recharge	Plantation along the boundary, erosion control measures, or slope stabilization measures shall be undertaken based on the activities envisaged in the redevelopment plan approved by the SC.	EPC Contractor
		Air	Improvement in air quality	-	-
		Noise	No impact	-	-
		Biological	Increased vegetation	Plantations along the boundary shall be undertaken.	EPC Contractor
		Socio-economic	No impact	-	-

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
		Solid waste management	No impact	-	-
E.5.	Operationalization of the project stretch	Land	Improvement of road geometry and pavement condition	Proper implementation of traffic rules will be by the traffic Police. Proper maintenance of traffic signs and implementation of accident care facilities along the road will be by the project implementation agency.	EPC Contractor
		Water	Water logging during monsoon will not take place.	The cross-drainage system and flood water drains shall be periodically cleared. Contingency plans for clean-up of spills of oil, fuel and toxic chemicals. Drainage systems shall be maintained well to accommodate proper storm water flow.	EPC Contractor
		Air	Reduced dust generation From road. Increased vehicular emissions due to increased traffic	Proper implementation of vehicular emission control rules by the State Motor Vehicles Department. Roadside tree plantation shall be restored and maintained as per the compensatory plantation plan. SPM, RSPM, CO, SO2, and NOx to be monitored asper Environmental Monitoring Plan.	EPC Contractor
		Noise	Increase in the ambient noise levels, especially during night time along the project road.	Development of greenbelt shall comprise of selected species of trees with high canopy along the project road for attenuation of noise. Use of horns shall be restricted at sensitive locations like schools and hospitals through the use of appropriate signboards along the road. Use of air horns shall be minimized during night. Noise barriers shall be provided along the road at sensitive locations such as hospitals, schools, residential areas, courts etc. Noise monitoring shall be conducted as per Environmental Monitoring Plan.	EPC Contractor
		Biological	Improved biodiversity and aesthetics	The cross-drainage system and flood water drains shall be periodically cleared.	EPC Contractor

Sl. No.	Activity	Environmental Attribute	Potential Impact	Management Measures	Responsibility
				Regular maintenance of plantations especially during summer season till defect liability period gets over.	
		Socio-economic	Less chances of accidents.	Proper implementation of traffic rules by the traffic Police. Proper maintenance of traffic signs and implementation of accident care facilities along the road will be by the project implementation agency.	EPC Contractor
			Safety	New buildings are prohibited within 50 mts of the carriage way. No new hospitals and schools are allowed within 200 mts of the carriage way. Where ever required appropriate noise barrier should be constructed.	EPC Contractor
		Solid waste management	No impact	-	-

9.3 Block Cost Estimation for EMP

The cost of implementing above mitigation measures as estimated in **Table 61**. The overall cost for the implementation is estimated as Rs 161.39 Lakhs per annum including construction and operation phase. The environmental monitoring cost is estimated to be 60.64 Lakhs and around 100.75 Lakhs comes under miscellaneous cost.

Table 61: Cost Estimates for Environmental Management Plan

SL No	Component	Description	Unit	Number of locations	Frequency of Monitoring	Quantity	Unit cost (INR)	Total cost (INR) Detail Cost
2	MONITORING COST							
2.1	Construction Stage (3 years period)							
2.1.1	Air	Sampling and monitoring ambient Air Quality and gaseous pollutants as per CPCB Standard Procedures at locations including approved hot mix plant locations, sensitive area and chainages as per direction by Environmental Specialist / Environmental Engineer of the Engineer for thrice a year for three years & Analysis charges for NO2, SO2, PM2.5, PM10, Pb, CO and NOx	No. of Samples	14	Twice in a week per season at each location	336	5,775.00	19,40,400.00
2.1.2	Water	Collection of grab samples of water quality at locations identified by the engineer for 3 years at the end of summer / before start of monsoon and Analysis of water quality for pH, Turbidity, total solids, turbidity COD, BOD, DO, Chlorides, Hardness, Oil & Grease, TSS, TDS, Total Coliform, Iron, Fluorides, Nitrates, E. coli, Total coliform and faecal coliform as specified in "Standard Methods for Examination of Water and Wastewater" published by WEF, AWWA and APHA as per direction of Environmental Specialist / Environmental Engineer of the Engineer	No. of Samples	14	One sample once in six months at each location	84	4,400.00	3,69,600.00

SL No	Component	Description	Unit	Number of locations	Frequency of Monitoring	Quantity	Unit cost (INR)	Total cost (INR) Detail Cost
2.1.3	Noise	Monitoring Noise level at Equipment Yards, Sensitive area and Settlements using hand held noise meters at locations and chainages identified by the Engineer) as per directions of Environmental Specialist / Environmental Engineer of the Engineer for thrice a year for three years	Nos.	14	Twice in a week per season at each location	336	1,100.00	3,69,600.00
2.1.4	Soil	Collection of grab samples of soil quality at locations and chainages identified by the engineer at the end of summer / before start of monsoon as per direction of Environmental Specialist / Environmental Engineer of the Engineer & Analysis of soil quality for Colour, texture, water holding capacity, porosity, permeability, Electrical conductivity, pH, Organic matter etc. as specified in Standard Methods for Examination of soil as per direction of Environmental Specialist / Environmental Engineer of the Engineer and as per MoEF rate list.		4	One sample per season at each location	36	4,400.00	1,58,400.00
2.1.6	Transportatio nCost	Transportation cost for monitoring of noise, air and water during construction period for 3 years	L.S.	-	-	-	-	3,60,000.00
2.2	Operation Stage (Initial period of 5 years)							

SL No	Component	Description	Unit	Number of locations	Frequency of Monitoring	Quantity	Unit cost (INR)	Total cost (INR) Detail Cost
2.2.1	Air	Sampling and monitoring ambient Air Quality and gaseous pollutants as per CPCB Standard Procedures at locations and at chainages identified by the Engineer including sensitive area and chainages as per direction by Environmental Specialist / Environmental Engineer of the Engineer & Analysis charges for NO2, SO2, PM2.5, PM10, O3 and CO	No. of Samples	6	Twice in a week per season at each location	240	5,775.00	13,86,000.00
2.2.2	Water	Collection of grab samples of water quality at locations and chainages identified by the engineer at the end of summer / before start of monsoon as per direction of Environmental Specialist / Environmental Engineer of the Engineer & Analysis of water quality for pH, Turbidity, total solids, COD, BOD, DO, Chlorides, Hardness, Oil & Grease, TSS, TDS, Total Coliform, Iron, Fluorides, Nitrates, E. coli, Total coliform and faecal coliform etc. as specified in "Standard Methods for Examination of Water and Wastewater" published by WEF, AWWA and APHA as per direction of Environmental Specialist / Environmental Engineer of the Engineer and as per MoEfF Rate.	No. of Samples	10	One sample at each location in every six months	100	4,400.00	4,40,000.00

SL No	Component	Description	Unit	Number of locations	Frequency of Monitoring	Quantity	Unit cost (INR)	Total cost (INR) Detail Cost
2.2.3	Noise	Monitoring Noise level at Sensitive area and Settlements using hand held noise meters at locations and chainages identified by the Engineer) identified by the Engineer and as per directions of Environmental Specialist / Environmental Engineer of the Engineer	Nos.	6	Twice in a week per season at each location	240	1,100.00	2,64,000.00
2.2.4	Soil	Collection of grab samples of soil quality at locations and chainages identified by the engineer at the end of summer / before start of monsoon as per direction of Environmental Specialist / Environmental Engineer of the Engineer & Analysis of soil quality for Colour, texture, water holding capacity, porosity, permeability, Electrical conductivity, pH, Organic matter etc. as specified in Standard Methods for Examination of soil as per direction of Environmental Specialist / Environmental Engineer of the Engineer and as per MoEF rate list.	Nos.	4	One sample at each location in every six months	40	4,400.00	1,76,000.00
2.2.5	Transportatio nCost	Transportation cost for monitoring of noise, air and water during operation period	L.S.					6,00,000.00
TOTAL MONITORING COST								60,64,000.00
3	MISCELLANEOUS COST							

SL No	Component	Description	Unit	Number of locations	Frequency of Monitoring	Quantity	Unit cost (INR)	Total cost (INR)
								Detail Cost
3.1	Training	Training - Awareness and Routine training	L.S.			-	-	1,20,000.00
3.2	Advocacy and Policy Making	Holding meetings for policy planning and subsequent review meetings with Revenue Department, Forest Department, local representatives, NGOs, etc. regarding development controls.	Year	-	-	5	11,000.00	55,000.00
3.3	Administrative Charges including logistics	Maintenance of vehicle with the Environment Cell, Data processing, administrative support, stationery etc.	Months	-	-	60	40,000.00	24,00,000.00
3.4	Miscellaneous Items	Digital Camera for the Environment Cell	No.	-	-	2	10,000.00	20,000.00
3.5	Planting of saplings	Compensatory plantation proportionate to trees cut	No	-	-	74,800	100.00	74,80,000.00
TOTAL MISCELLANEOUS COST								**1,00,75,000.00**
TOTAL COST								**1,61,39,000.00**

9.4 Compliance Report

The project management shall submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms and conditions on 1st June and 1st December of each calendar year. All such reports shall be public documents. The latest such compliance report shall be displayed on the web site of the concerned regulatory authority.

9.5 Institutional Strengthening and Arrangement

Though rich in legal and regulatory instruments, the implementing agencies are unable to regulate and monitor a sound environmental management plan due to lack of enforcement capacity. Therefore, violations or missed mitigation commitments often go unreported. The gaps and deficiencies pointed out can be removed by proper arrangements. Institutional strengthening component has accordingly been identified. As such, the overall arrangement is as follows.

9.6 Organizational Arrangements

An Environmental Unit shall be established for the proposed project, with a manager to address the environmental issues. The Environmental Unit will have proper staff to ensure the implementation of Environmental Management Action Plan (EMAP) and related measures. The Manager (Environment) shall be familiar with the Indian environmental legislations, shall have proper training in the relevant fields, be familiar with the environment and related issues of the region, and will be able to coordinate with NGOs, community groups, and government departments.

9.7 Environmental Training

Training of staff shall be done at a number of levels. Some short-term training is required for the Environment Manager, other staff members of the Environment Unit and the contractor staff to raise their levels of environmental awareness. Help of State Pollution Control Board shall be sought in this regard. In the long-term training, special environmental issues shall be examined and likely solutions shall be provided to the Environmental Unit.

9.8 Environmental Monitoring

In order to ensure that the prescribed environmental norms are maintained during the constructional and the operational phases, regular monitoring is one of the most important

components of the institutional arrangement. The regular monitoring of Air pollution, Water quality, Noise pollution, and maintenance of trees, etc. shall be done as per Environmental Monitoring Plan. The field reports of various environmental components shall be received quarterly, and lapses, if any, have to be taken care of.

9.9 Reporting Mechanism

Monitoring and Evaluation are critical activities in implementation of all projects. Monitoring involves periodic checking to ascertain whether activities are going according to the plans. It provides the necessary feedback for project management to keep the programme on schedule.

The reporting system shall operate linearly with the contractor who is at the lowest rung of the implementation system reporting to the Supervision Consultant, who in turn shall report to the Project Implementation Unit (PIU) and Environmental and Social Development Unit (ESDU) of UPEIDA at corporate office. All reporting by the contractor and Supervision Consultant shall be on a quarterly basis. The ESDU in association with PIU shall be responsible for preparing targets for each of the identified EMP activities. All subsequent reporting by the contractor shall be monitored as per these targets set by them before the contractors move on to the site.

The compliance monitoring and the progress reports on environmental components may be clubbed together and submitted to the ESDU at corporate office and PIU, quarterly during the implementation period. The operation stage monitoring reports may be annual or biennial provided the Project Environmental Completion Report shows that the implementation was satisfactory. Otherwise, the operation stage monitoring reports shall have to be prepared as specified in the said Project Environmental Completion Report.

During the implementation period, a compliance report may include description of the items of EMP, which were not complied with by any of the responsible agencies. It would also report the management and field actions taken to enforce compliance. It may however, be noted that certain items of the EMP might not be possibly complied with in the field due to a various reasons. The intention of the compliance report is not to suppress these issues but to bring out the circumstances and reasons for which compliance was not possible (such as jurisdictional issues). This would help in rationalizing the implementation of the EMAP during the remaining duration of implementation. Solutions for further effective implementation shall also come out as a result of the compliance monitoring reports.

Responsibilities for overseeing will rest with the Supervision Consultant's staff reporting to the PIU and ESDU at corporate office**.**

- Documents / Reports to be Prepared by the Concessionaire
- Concessionaire should submit the following documents/ reports on management and redevelopment of various construction related activities to CSC for approval
- Construction camp management and redevelopment plan
- Labour camp management and redevelopment plan
- Quarry and crusher management and redevelopment plan
- Barrow area management and redevelopment plan
- Debris disposal site management and redevelopment plan

Other reports to be prepared by the concessionaire are given in Annexures and are mentioned in EMAP.

Chapter 10 Summary and Conclusion

10.1 Introduction

The environment clearance of the title work "Proposed Development of Gorakhpur Link Expressway through Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh districts in the state of Uttar Pradesh, M/s Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)" has been obtained from the SEIAA, Uttar Pradesh vide letter no. 569/Praya/SEAC/5305-4603/2018 dt. 25.01.2020. (Enclosed as **Annexure-I**).

This Final Comprehensive Environment Impact Assessment Report (CEIA) is in compliance to the General Condition no. 1 of aforementioned EC Letter.

This report also includes four seasons baseline data of all the environmental parameters namely Air, Water, noise, Soil of the EIA report including for the period Sept 21 to Aug 22 covering the general and specific conditions of the EC Letter.

Uttar Pradesh Expressways Industrial Development Authority (UPEIDA), has been entrusted by the Government of Uttar Pradesh for Development of Expressways, will act as project implementing organization for the proposed Gorakhpur Link Expressway.

The present project covering the stretch of 91.352 km Express Highway starts at 1.3 km from Underpass near Jaitipur at Gorakhpur Bypass (NH-27) and 3.7 km West from Gorakhpur-Mau intersection and ends in Purvanchal Expressway, 8.3 km from Shahganj- Akbarpur Road (SH 5) intersection of Purvanchal Expressway at chainage 190+600 (towards Lucknow).

Most of the project road stretch passes through plain terrain. Generally, the land use along the project stretch is mixed with agricultural and residential area. Summary of Environmental clearances/ permits/ approvals required for the sub-project is presented in **Table 62.**

Table 62: Environmental Permits / Approvals Required for the Sub-project

Sl. No	Type of Clearance	Statutory Authority	Applicability	Project Stage	Time Required	Responsibility
1.	Prior Environmental Clearance under EIA Notification, 2006	MoEF&CC	Applicable	Pre-constructio n		
2.	Tree felling permission	Revenue Department of Uttar Pradesh	Felling of avenue trees	Pre-construction		
3.	NOC and Consents under The Air (Prevention & Control of	Uttar Pradesh Pollution Control Board	For establishin g Hot mix plants, Crushers	Construction (Prior to work initiation)	2-3 months	EPC Contractor

Sl. No	Type of Clearance	Statutory Authority	Applicability	Project Stage	Time Required	Responsibility
	Pollution) Act, 1981		and batching plants			
4.	NOC and Consents under The Water (Prevention & Control of Pollution) Act, 1974	Uttar Pradesh Pollution Control Board	For discharging of domestic waste water through soak pit	Construction (Prior to work initiation)	1-2 months	EPC Contractor
5.	Permission to store Hazardous Materials under Hazardous Waste (Management and Handling) Act 1989	Uttar Pradesh Pollution Control Board	Storage and Transportatio nof Hazardous Materials and Explosives	Construction (Prior to work initiation)	2-3 months	EPC Contractor
6.	Explosive license under The Explosives Act (& Rules), 1884 (revised in 1983)	Chief Controller of Explosives, petroleum & Explosive Safety Organization	Storage of explosive materials	Construction (Prior to work initiation)	2-3 months	EPC Contractor
7.	PUC certificate for vehicles for construction under Central Motor and Vehicle Act 1988	Transport Departmentof Uttar Pradesh	For all construction vehicles	Construction (Prior to work initiation)	1-2 months	EPC Contractor
8.	Quarry lease deeds and license under The Mines Act, 1958	Mines and Geology Department of Uttara Pradesh	Quarrying and borrowing operations	Construction (Prior to work initiation)	2-3 months	EPC Contractor
9.	NOC for ground water extraction under Section 4 of Environmental (Protection) Act, 1986	Central Ground Water Authority	Ground water extraction	Construction (Prior to work initiation)	2-3 months	EPC Contractor

10.2 Project Description

The present project covering the stretch of 91.352 km of Expressway (Gorakhpur Link Expressway project) in the State of Uttar Pradesh encompasses of a greenfield expressway project with four lane paved shoulder expandable to six lanes based on expressway geometric design, pavement design, up gradation of intersections, underpasses / ROBs, and new bridges and structures wherever necessary along with provision of road safety features.

The expressway has been proposed as 4 lane dual carriageway road with service road on either side for full length of the expressway, except at major bridge locations where it has been discontinued. A minimum Right of Way (ROW) of 110 m has been considered for development of expressway. The standard typical cross section has been developed with 2 lane with lane width of 3.75 m, 3.0 m paved shoulder, 2.0 m earthen shoulder, 075 m median on each side with 5.5 m wide raised medians.

The Expressway passes the following major Districts such as Gorakhpur, Sant Kabir Nagar, Azamgarh and Ambedkar Nagar. The summary of project activity is given in **Table 63** below:

Table 63: Summary of Project Activity

Sl. No	Description		Quantity			
1	Total length (km)		91.352			
2	Proposed RoW for new alignment (m)		110m			
3	Traffic (PCUs)	Location	At Km	At Km	At Km	At Km
		Sections	-0+817 to 12+500	12+500 to 27+600	27+600 to 62+000	62+000 to 90+535
		Present Traffic	13599	13891	13908	13249
4	Projected traffic (PCUS)	10 Years	26661	27110	27273	25788
		20 Years	47017	47624	48096	45189
		30 Years	77671	78521	79454	78247
5	Pavement type		Flexible pavement except at Toll Plaza locations. Rigid pavement at Toll Plaza locations.			
6	Number of major bridges		7			
7	Number of minor bridges		13			
8	Number of culverts		390			
9	Number of flyovers		7			
10	Number of vehicular underpass		16			
11	Number of light vehicular underpasses		50			
12	Number of pedestrian / cattle underpasses		32			
13	Number of toll booth		Toll Booths on Expressway – 20 Toll Booths on Ramps - 18			
14	Number of GAIL pipe line		3			
15	Number of wayside amenitiesfacilities		2 Wayside Amenity			
16	Number of wild animal underpasses		Nil			

Sl. No	Description	Quantity
17	Number of road over bridge railway crossings	Nil
18	Length of drain proposed (km)	176.066
19	Length of retaining wall proposed (km)	2.45
20	Length of road requiring filling (km)	91.352
21	Length of crash barriers proposed(km)	192.674
22	Number of sign boards proposed	1647
23	Length of road with street lights proposed (km)	At interchanges, toll plazas, wayside facilities and at structure locations
24	Length of service road proposed (km)	121.292
25	Number of toll plazas proposed	2 on Expressway and 3 on Interchange ramps
26	Number of rest areas proposed	2
27	Number of revenue villages through which alignment passes	148
28	Length of alignment proposed in agricultural land (km)	91.352
29	RoW of the alignment proposed in agricultural land (m)	110m
30	RoW of new alignment proposed in forest area (m)	No forest area comes in the proposed alignment
31	Number of trees proposed to be felled for the project	21356
32	Total area of land to be acquired for the project (ha)	1098.87 Ha
33	Number of buildings to be demolished for the project	499
34	EMP cost for the project (Lakh)	161.39
35	R&R cost for the project (Rsin Cr.)	1563.39
36	Utility shifting cost for the project (Rs in Cr.)	87.75
37	Civil cost for the project (Rs in Cr.)	3126.11
38	Total Cost for the project (Rs in Cr.)	5938.08

10.3. Analysis of Alternatives

Proposal for studying three alternative alignment options based on the prefeasibility study report was mainly because of crossing of GAIL pipelines and Ghaghara River crossing. The comparison of the 3 alignment is given in **Table 64.**

Table 64: Comparison of Options

Criteria	Option 1	Option 2	Option 3
Length (Km)	89.539+1.581	87.875+1.581	87.435+1.581
River width at Crossing (Ghaghara) m	650	1040	1100
Ghaghara River Bridge Length (m)	≈ 1600	≈ 2500m	≈ 2400 m
Ghaghara River Bridge	Bridge portion in straight reach	Bridge portion in straight reach	Bridge Portion comes in curve
Horizontal Geometry	33 Curves	37 Curves	36 Curves
Settlement along alignment	26	29	31
Connectivity with hamlet	122	110	112
GAIL Pipe Line Crossing	Three Locations	One Location	One Location
Minimum Horizontal Curve radius	1200m	1200m	1200m

At the locations of GAIL pipe line crossings and Ghaghara River, the modifications were inevitable from the pre-feasibility option and alignment were improved after considering the site constraints. Out of the three options proposed, Option 1 is having GAIL pipe line crossing at 3 locations where as in the other two options GAIL pipeline crosses the alignments only at one location. However, Option 1is proposed with minimal horizontal curves along the alignment and minimal displacement of settlements on comparison with Option 2 and 3. Apart from the above, option 1 crosses River Ghaghara at its narrowest section after avoiding curves along the bridge reducing the construction cost considerably. Also, option 1 ensures the maximum connectivity with the nearby hamlets on comparison with the other two options. Hence Option 1 is selected from the three proposed alternatives.

Also, after detailed topographical survey and geometric design of the final option, the length of alignment concludes to 89.771 km excluding the loop of interchanges proposed at the start and end point of the expressway.

Out of the three proposals for alignment, option 1 with less deviation from prefeasibility alignment option at the Ghaghara River crossing was selected as the final option. This option avoids the curve along bridge portion and bridge lies at straight stretch of the road. This will also reduce siltation and scouring of river bed at the Ghaghara River. In this option, bridge lies at the upstream of newly constructing bridge and length of the bridge will be minimal. After including the loop of interchanges proposed at the start and end point of the expressway, finalized alignment length comes to 91.352 km, which is the proposed alignment of Gorakhpur Link Expressway.

10.4 Description of Environment

Collection of the baseline environmental status of the project influence area helps to predict the magnitude of impacts that are likely to be caused due to the proposed improvements of the project road. It also helps to identify critical environmental attributes required to be monitored during and after the proposed developments. In addition to the baseline environmental monitoring, field inspection at all the sensitive locations, collection of secondary information for all the environmental components and discussions with the officials were also done.

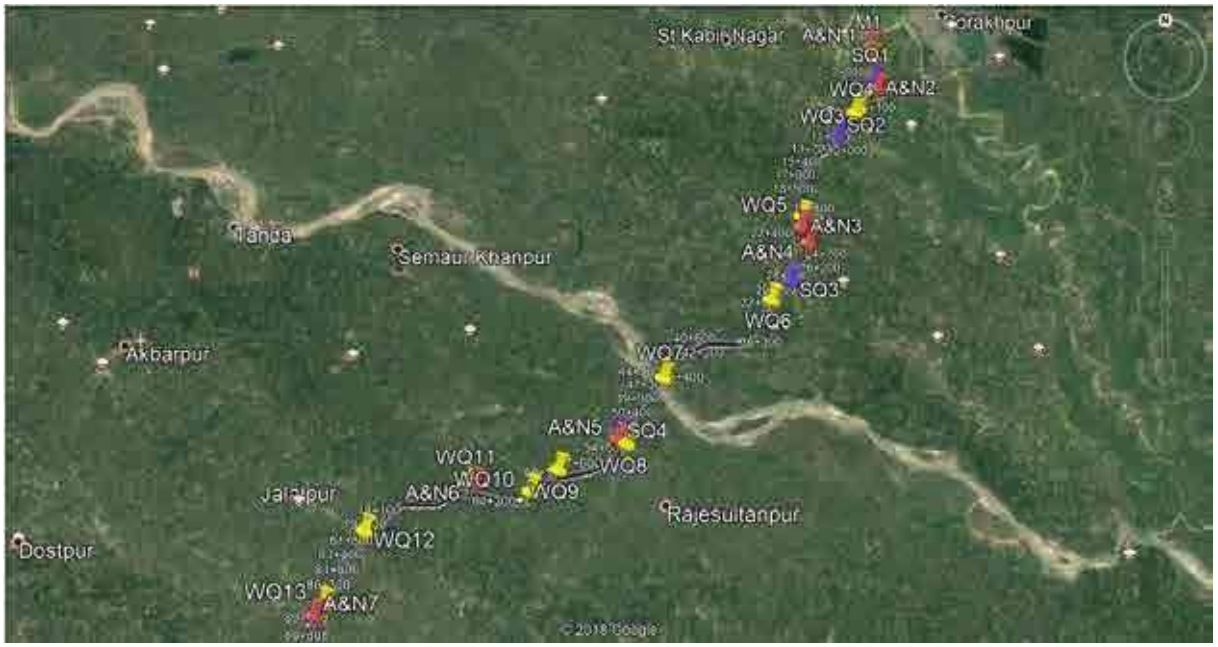


Figure 83. Sampling locations for Baseline Environmental Monitoring

10.4.1 Land Environment

10.4.1.1 Soil Characteristics

Project region is a part of Central Ganga Plains and is covered by Quaternary alluvial deposits. The older alluvial which occupies a large part of the area are locally known as 'Bhangar'. The soils of the region are mainly transported i.e. alluvial soil, comprising sand, silt and clay in varying proportions and rich in humus.

10.4.1.2 Land Use

Proposed expressway mostly passes through important areas like agricultural lands, water bodies, forest areas (protected) and settlement areas. Some settlement areas are also located in close vicinity of proposed alignment. The project area is found to be plain terrain. 90% of the area is cultivated land and the maximum slope difference found is about 16m.

10.4.2 Water Environment

10.4.2.1 Surface Water

The proposed Gorakhpur link expressway alignment crosses six rivers namely, Aami River (7+300), Kuwano River (31+700), Ghaghara River (46+000), Choti Sarayu (63+700), Tons River (80+900) and Majohi river (88+500). Among the six, Ghaghara River is a major river originating from the lake Manasasarovar having a large catchment area.

10.4.2.2 Ground Water

The project alignment passes/abuts several ground water bodies such as wells, hand pumps and deep tube wells. Details of ground water bodies passing/abutting the project road are presented in **Table 4.6** of **Chapter 4.**

10.4.3 Air Environment

10.4.3.1 Temperature

The climate in the regions is warm and temperate. The temperature here averages 25.5 °C. Precipitation here averages 1227 mm.

10.4.3.2 Wind

For determining the wind direction along the proposed alignment, interpretation of the wind rose diagram is made and concluded.

From the wind Rose Diagram it can interpreted that the wind blows predominantly from East (E) direction which occurred on 26% of years. On 12% of the years the winds are from West (W). Average speed of 1.5 to 4.5 mps can be seen from many directions and the winds are calm on many directions.

10.4.4 Noise Environment

Noise monitoring is done at 7 sensitive locations to check the noise pollution in area of alignment. Out of the seven locations of noise monitoring, four locations are at major road crossings (two locations are at the start and end of Alignment and other two locations are at major district road crossings), remaining locations represent densely populated, commercial and industrial area/zone. Noise level for Village Bhagwanpur near factory location is within the prescribed limits of CPCB whereas noise level for remaining four locations exceeds the standard limits. The increase in noise level is due to vehicular traffic, honking at junctions, public activities, and industrial activities. At the critical locations noise control barriers have been proposed.

10.4.5 Biological Environment

Study of Census, 2011 presents that Gorakhpur district is having the highest percentage of forest area among the project alignment districts. On analysis of Topographical sheets issued by Survey of India no forest area was observed on the proposed alignment of the Gorakhpur Link Expressway Project.

10.4.6 Socio Economic and Health Environment

Literacy rate of the four districts are of 83%, higher than the national average of 59.5. The literacy rate of Gorakhpur is 70.83 % and that of Sant Kabir Nagar, Azamgarh and Ambedkar Nagar are 69 %, 70.93 % and 72.23 % respectively. Population density is of 1337, 1041, 1138 and 1020 for Gorakhpur, Sant Kabir Nagar, Azamgarh and Ambedkar Nagar.

10.4.6.1 Anticipated Environmental Impact

Positive Impact

The overall human exposure to noise and air pollution will be minimal due to less congestion. with expected decrease in overall traffic density due to increased road carrying capacity, the chances of accidents will reduce considerably. The accessibility and connectivity increase as the project road is the major connectivity between the various towns and the capital city of Uttar Pradesh. The proposed project is expected to improve the quality of life of the people residing in the project zone in terms of their economic, social and health status. Both skilled and unskilled labors shall be employed during the construction stage of the project.

Negative impact

Temporary impacts on flora and fauna due to the construction activities. It also causes loss of topsoil due to clearing and grubbing of new alignment, borrow area and quarry operation, construction of camps and material stacking yard. Increased noise levels due to the movement of vehicles and construction activities will be a major impact. Increased soil erosion leading to loss of top soil and pollution of surface water bodies. Also causes spillage of oils and other hazardous materials leading to pollution of surface and sub-surface waters. Pollution of rivers and canals due to construction of bridges and culverts

10.4.6.2 Mitigation measures

Construction Phase

- In order to curb the increased fugitive dust emissions in the areas due to vehicular movement, raw material transportation and borrow area excavation, provisions should be made for sprinkling of water on all these locations.
- For the removal of debris, daily inspection must be done. Construction which requires street closing should be performed in off peak hours. Construction vehicles and machineries should obtain “Pollution Under Control” certificate from the concerned regulatory authority. Construction yards should be located beyond 1Km distance from major settlements and the proper settings for the dispersion of emitted pollutants must be taken.
- Construction workers should be provided with Personal Protective. Construction during night should be done at restricted condition. Air quality monitoring should be conducted as per Environmental Monitoring Plan.

- Operation Phase
- The surplus earth should be used to fill up low lying areas and should not be allowed to pilled up along alignment. All vehicles to adhere to the engine maintenance schedules and standards to reduce air pollution due to vehicular emissions. Plantation of trees should be done along the alignment.

10.5 Environmental Monitoring Programme

The environmental monitoring plan is presented in **Table 65.**

Table 65: Environmental Monitoring Programme

Air Quality Monitoring	
Project stage	**Construction and operation stages**
Parameter	PM10, PM 2.5, SO2, NOx, CO and Pb
Sampling Method	High volume air sampler to be located 50 m from the source of pollution in the downwind direction. Method specified by CPCB for analysis shall be followed.
Standards	Revised National Ambient Air Quality (NAAQ) Standards set by CPCB
Frequency	One continues sample from 7 locations for PM10, PM2.5 Three 8 hourly samples from 7 locations for SOX, NOX, CO
Duration	Continuous 24 hours / or for 1 full working day
Locations	At the start and end of the proposed Alignment, toll plaza, near sensitive features like Colleges, dense populated area and cultivated area along the road at an average distance of 10 Km during operation stage.
Measures	Wherever air pollution parameters increase above specified standards, additional measures as decided by the engineer shall be adopted.
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA (or) Sub consultants appointed by UPEIDA
Water quality Monitoring	
Project stage	**Construction stage**
Parameter	pH, Temperature, Turbidity, Mg, Hardness, Total alkalinity, Chloride, Sulphate, Nitrate, Flouride, sodium, potassium, salinity, total nitrogen, totalphosphorous, DO, BOD, COD, Heavy metals, Total Coliforms, Faecal Coliforms, phytoplankton.
Sampling Method	Grab sample collected from source and analysis as per Standard Methods for Examination of water and Waste water
Standards	Indian standards for Inland Surface Water (IS; 2296, 1982) and for Drinking water (IS; 10500,1991)
Frequency	One samples from ten locations (2 sample of Ground Water and 11 samples of Surface water which involves 6 rivers along the alignment, major ponds and Nalla)
Duration	One-time grab sampling
Location	At major water bodies along the road at an average distance of 20 Km
Measures	At locations of increased water pollution towards downstream, all inflow channels shall be checked for pollution loads and channel delivering higher pollution loads shall be terminated from disposal into the water source.
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA (or) Sub consultants appointed by UPEIDA
Noise Level Monitoring	

Project stage	Construction and operation stages
Parameter	Noise level on dB (A) scale
Sampling Method	Measure equivalent noise levels using an integrated noise level meter kept at a distance of 15m from edge of the pavement
Standards	Noise Pollution (Regulation and Control) Rules, 2000
Frequency	Hourly samples from 7 locations
Duration	Reading to be taken at 15 seconds interval for 15 minutes every hour for 24 hours and then average will be taken.
Location	At the start and end of the proposed Alignment, near sensitive features like Colleges, dense populated area and cultivated area along the road at an average distance of 10 Km during operation stage.
Measures	In case of noise levels causing disturbance to the sensitive receptors, management measures as suggested in the EMP shall be carried out.
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA(or) Sub consultants appointed by UPEIDA
Soil Quality Monitoring	
Project stage	Construction
Parameter	Monitoring of Colour, texture, water holding capacity, porosity, permeability, electrical conductivity, pH, Organic Matter
Sampling Method	Sample of soil collected to be acidified and analyzed using absorption spectrophotometer
Standards	Threshold for each contaminant set by IRIS database of USEPA until national standards are promulgated
Frequency	One sample from 4 locations
Duration	One-time grab sampling
Location	At productive agriculture lands abutting traffic detours and traffic diversions and major intersections at an average distance of 20 Km along the road.
Measures	At location of increased pollution levels, source shall be identified and shall be diverted from future disposal
Implementation	Contractor through approved monitoring agencies
Supervision	UPEIDA(or) Sub consultants appointed by UPEIDA

10.6 Additional Studies

Additional studies as per approved ToR is included in the final EIA Report.

10.7 Project Benefits

The proposed Express way increases a community's direct access to the capital of the state, Lucknow. It also brings economic growth, job creation and improves trade. Due to better infrastructure reputed educational or health institutes will find it attractive and viable to establish themselves in the project influence area, leading to development of social infrastructure for the local residence.

The vehicle operating and maintenance cost will decrease. People will have increased access to better social and health infrastructure located in faraway places. This project will be a giant leap in the development process of the entire region.

10.8 Environment Management Plan

In order to address the impacts predicted for various project activities, mitigation measures, environmental enhancement measures, monitoring actions and a reporting schedule are suggested in the form of an Environmental Management Action Plan (EMAP). The EMAP includes a list of all project related activities and impacts and their mitigation measures at different stages of project, namely, pre-construction phase, construction phase and operation Phase, Environmental monitoring plan and a clear reporting schedule. The EMP sets a time frame to all proposed mitigation and monitoring actions with specific responsibility assigned to the proponents, the contractors and the regulatory agencies.

10.9 Block Cost Estimate for EMP

The overall cost for the implementation is estimated as Rs 161.39 Lakhs per annum including construction and operation phase. The environmental monitoring cost is estimated to be 60.64 Lakhs and around 100.75 Lakhs comes under miscellaneous cost.

Chapter 11

DISCLOUSER OF CONSULTANT

Name and address of the Consultant	**M/s PARIVESH ENVIRONMENTAL ENGINEERING SERVICES** 5/916,Viram Khand, Gomti Nagar, Lucknow-226010, Contact No. 9819893405
Certificate No.	**NABET/EIA/2124/IA0092, Valid till November 11/2024**

IN ASSOCIATION WITH

Name and address of the Consultant	**M/s GLOBUS ENVIRONMENT ENGINEERING SERVICES** 326-AB, 3rd Floor, Sahara Shopping Center, Ayodhya Road, Lucknow -226016. Contact: 0522-4037540,+91-7398041242
Certificate No.	***NABET/EIA/2124/RA0245, Valid Till August 24/2024***

S. No.	EC/FAE	NAME OF EXPERT	ORGANIZATION
1	EIA Coordinator	Mr. Tarun Saharan	M/s Parivesh Environmental Engineering Services
2	Associate Coordinator	Mr. Akhilesh Kumar Gupta Dr. Vikas Pandey	M/s Globus Environment Engineering Services
3	Air Pollution Monitoring, Prevention & Control (AP) & Air Quality (AQ)	Mr. Vikas Tripathy	M/s Parivesh Environmental Engineering Services
		Dr. Vikas Pandey	M/s Globus Environment Engineering Services
4	Water Pollution (WP)	Ms. Meera Dubey	M/s Globus Environment Engineering Services
5	Solid & Hazardous Waste (SHW)	Mr. Vikas Tripathy	M/s Parivesh Environmental Engineering Services
		Dr. Vikas Pandey	M/s Globus Environment Engineering Services
6	Socio-economy (SE)	Mr. Amen Xavier Dr. Vikas Pandey	M/s Globus Environment Engineering Services
7	Land Use (LU)	Mr. Tarun Saharan	M/s Parivesh Environmental Engineering Services
8	Ecology and Biodiversity (EB)	Dr. Vikas Pandey	M/s Globus Environment Engineering Services
9	Soil Conservation (SC)	Mr. Hanumantha Rao.V.	M/s Globus Environment Engineering Services
10	Risk Hazard (RH)	Mr. Vikas Tripathy	M/s Parivesh

			Environmental Engineering Services
11	Air Quality (AQ)	Mr. Vikas Tripathy	M/s Parivesh Environmental Engineering Services
		Dr. Vikas Pandey	M/s Globus Environment Engineering Services
12	Noise and Vibration (NV)	Mr. Tarun Saharan	M/s Parivesh Environmental Engineering Services
		Dr. Vikas Pandey	M/s Globus Environment Engineering Services
13	Geology (GEO)	Dr. Rakesh Singh	M/s Globus Environment Engineering Services
14	Hydro Geology(HG)	Dr. Rakesh Singh	M/s Globus Environment Engineering Services
15.	Land Use (LU)	Mr. Sahil Sood	M/s Globus Environment Engineering Services

QUALITY COUNCIL® OF INDIA
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National Accreditation Board for Education and Training

NABET

Certificate of Accreditation

Parivesh Environmental Engineering Services

5/916, Viram Khand, Gomti Nagar, Lucknow, Uttar Pradesh-226010

*The organization is accredited as **Category-A** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals- opencast mining only	1	1 (a) (i)	B
2	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	A
3	Cement plants	9	3 (b)	A
4	Synthetic organic chemicals industry	21	5 (f)	A
5	Ports, harbours, break waters and dredging	33	7 (e)	B
6	Highways,	34	7 (f)	B
7	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated January 4, 2022 and Supplementary assessment minutes dated April 22, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2295 dated April 1, 2022. The accreditation needs to be renewed before the expiry date by Parivesh Environmental Engineering Services, Lucknow following due process of assessment.

NABET

Sr. Director, NABET
Dated: May 12, 2022

Certificate No.
NABET/EIA/2124/IA 0092(Rev.01)

Valid up to
November 11, 2024

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website

NATIONAL ACCREDITATION BOARD FOR EDUCATION & TRAINING
QUALITY COUNCIL OF INDIA
6th Floor, ITPI Building, Ring Road, I.P. Estate, New Delhi
Scheme for Accreditation of EIA Consultant Organizations
Accreditation Committee Meeting for Supplementary Assessment held Through Video Conferencing on April 22, 2022

The following members were present during the meeting:

1. Mr. A. K. Ghose - Chairman
2. Dr. G. K. Pandey - Member
3. Dr. P. Ahujarai - Member
4. Prof. D. K. Sharma - Member
5. Dr. Manoranjan Hota - Member
6. Dr. J. S. Sharma - Member

Dr. Ranjini Warrier and Prof. Rajesh Khanna expressed their inability to attend the meeting.

Dr. Pawan Kumar Singh – Deputy Director and Mr. Vipin Pant– Accreditation Officer from NABET-QCI were present in the meeting.

The following cases were discussed and the decisions taken thereof are:

1.0 Cases of Supplementary Assessment

1.1 Manusrushti, Kalyan

The case of Manusrushti, Kalyan was discussed in in IA AC meeting vide minutes dated February 5, 2021 wherein ACO was accredited for sectors 4(B), 8(B), 21(A), 22(A), 37(B), 38(B) and 39(B). ACO has proposed candidates for following scope expansion (for which ACO has proposed following functional area experts) and for other already approved sectors/FAs. The assessment result of the same is as under:

1.1.1 Scope of Accreditation

Sl. No.	NABET Scheme Sectors	Sector Description	Cat	Sector Number (MoEFCC Notification dt. Sep. 14,2006 & Amendments)
1	1	Mining of minerals- opencast mining only	A	1 (a) (i)
2	9	Cement plants	B	3 (b)
3	34	Highways,	A	7 (f)

1.1.2 EIA Co-ordinators (ECs)

Sl. No	Name	Sectors			Cat.	Remarks
		Applied	Recommended	Approved		
Empanelled						

Sl. No	Name	Sectors			Cat.	Remarks
		Applied	Recommended	Approved		
1	Amar Nandkishor Paliwal	1	Yes	Yes	A	Opencast mining only
2	Abha Garg	9	Yes	Yes	B	None
		34	Yes	Yes	A	
		38	Yes	Yes	B	
		39	Yes	Yes	B	
3	Chandrashekhar Chintaman Marathe	34	Yes	Yes	B	With an observation

1.1.3 Functional Area Experts (FAEs)

Sl. No	Name	Functional Areas (FAs)			Cat.	Remarks
		Applied	Recommended	Approved		
In-House						
1	Vaishali Tambat	LU	Yes	Yes	B	None
		AP	Yes	Yes	B	
2	Roshan Natthuji Bhongale	LU	Yes	Yes	B	With an observation
3	Shalini Devendra Paliwal	EB	Yes	Yes	B	With an observation
Empanelled						
4	Abha Garg	WP	Yes	Yes	A	None
		SW	Yes	Yes	B	
5	Chandrashekhar Chintaman Marathe	EB	Yes	Yes	B	With an observation
		SC	Yes	Yes	B	
		SE	-	-	-	Candidature withdrawn

1.1.4 Team Members (TMs)

a) As FAEs

Sl. No	Name	Functional Areas (FAs)		Approved FAE (To work under)	Remarks
		Applied	Accepted		
1	Sutkar Pankaj Ramesh	WP	Yes	Vaishali Tambat	None
		SW	Yes		

1.2 Parivesh Environmental Engineering Services, Lucknow

The case of Parivesh Environmental Engineering Services, Lucknow was discussed in IA AC meeting vide minutes dated January 4, 2022 wherein ACO was accredited for sectors 8(A), 9(A), 21(A), 33(B) and 38(B). ACO has proposed candidates for following scope expansion (for which ACO has required functional area experts) and for other already approved sectors/FAs. The assessment result of the same is as under:

1.2.1 Scope of Accreditation

Sl. No.	NABET Scheme Sectors	Sector Description	Cat	Sector Number (MoEFCC Notification dt. Sep. 14,2006 &

				Amendments)
1	1	Mining of minerals- opencast mining only	B	1 (a) (i)
2	34	Highways,	B	7 (f)

1.2.2 EIA Co-ordinators (ECs)

Sl. No	Name	Sectors			Cat.	Remarks
		Applied	Recommended	Approved		
Empanelled						
1	Tarun Saharan	34	Yes	Yes	B	None
		38	Yes	Yes	B	
2	Pooja Singh	1	Yes	Yes	B	Opencast mining only

1.2.3 Functional Area Experts (FAEs)

Sl. No	Name	Functional Areas (FAs)			Cat.	Remarks
		Applied	Recommended	Approved		
In-House						
1	Vikas Tripathy	AQ	Yes	Yes	B	None
		AP	Yes	Yes	B	
		RH	Yes	Yes	A	With an observation
		SHW	Yes	Yes	B	SW only
Empanelled						
2	Tarun Saharan	NV	Yes	Yes	B	None
		LU	Yes	Yes	A	

1.3 Shree Green Consultants, Surat

The case of Shree Green Consultants, Surat was discussed in IA AC meeting vide minutes dated April 6, 2021 and supplementary assessment vide minutes dated October 26, 2021 wherein ACO was accredited for sectors 2(A), 8(A), 17(A), 20(A), 21(A), 33(A), 34(B), 36(B), 37(B), 38(B) and 39(B). ACO has proposed the following candidates for shortfall of significant functional area (FA)- 'SC' for sectors-33, 34, 38 and 39; for scope expansion (for which ACO has proposed following functional area experts) and for other already approved sectors/FAs. The assessment result of the same is as under:

1.3.1 Scope of Accreditation

Sl. No.	NABET Scheme Sectors	Sector Description	Cat	Sector Number (MoEFCC Notification dt. Sep. 14,2006 & Amendments)
1	9	Cement plants	A	3 (b)
2	31	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes,	B	7 (c)

Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation

Globus Environment Engineering Services

326-AB, 3rd Floor, Sahara Shopping Center, Faizabad Road, Lucknow

The organization is accredited as Category-B under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2	Cement plants	9	3 (b)	A
3	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic scrubbers; basic organic chemicals, other synthetic organic chemical sand chemical intermediates)	21	5 (f)	A
4	Building and construction projects	38	8 (a)	B
5	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated Dec 10, 2021 and Supplementary Assessment minutes dated May 20, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/22/2414 dated July 05, 2022. The accreditation needs to be renewed before the expiry date by Globus Environment Engineering Services following due process of assessment.

Sr. Director, NABET
Dated: July 05, 2022

Certificate No.
NABET/EIA/2124/RA 0245

Valid up to
August 24, 2024

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

NATIONAL ACCREDITATION BOARD FOR EDUCATION & TRAINING
QUALITY COUNCIL OF INDIA

Scheme for Accreditation of EIA Consultant Organizations

Accreditation Committee Meeting for Re-Accreditation held on

December 10, 2021

Through Video Conference

The following members were present during the meeting:

1. Mr A K Ghose - Chairman
2. Dr. G. K. Pandey - Member
3. Dr. P. Ahujarai - Member
4. Dr. J. S. Sharma - Member
5. Prof. D. K. Sharma - Member
6. Dr. Manoranjan Hota - Member
7. Dr. Ranjini Warrier - Member

Prof. Rajesh Khanna expressed his inability to attend the meeting.

Mr. A K Jha - Senior Director, Dr Pawan K Singh - Assistant Director and Ms Kritika Sharma- Accreditation Officer were present in the meeting.

1.0 Cases for Re-Accreditation

The following case was discussed and decisions were taken as noted below.

1.1 Globus Environment Engineering Services, Lucknow

The ACO has been assessed as per Version 3 of the Scheme. Result of the Re-accreditation Assessment (RA) is given below:

1.1.1 Category of Approval:

The ACO has scored less than 60% marks hence it is accredited with Cat. B.

1.1.2 Scope of Accreditation:

S. No	NABET Scheme Sectors	Sector Description	Cat.	Sector No. (MoEFCC Notification dated Sep. 14, 2006 and Amendments)
1	1	Mining of minerals including opencast / underground mining	A*	1 (a) (i)
2	9	Cement plants	A*	3 (b)
3	21	Synthetic organic chemicals industry (dyes & dye intermediates;bulk drugs and intermediates excluding drug formulations; syntheticrubbers;	A*	5 (f)

		basic organic chemicals, other synthetic organic chemicalsand chemical intermediates)		
4	38	Building and construction projects	B	8 (a)
5	39	Townships and Area development projects	B	8 (b)

**Though the EIA Coordinators for these sectors were found suitable for Cat. A. However, the organization as a whole was accredited for Cat. B, in view of scoring less than overall 60% marks in their Office Assessment. Thus, the ACO cannot take up Cat. A project in these sectors.*

Note- Requrirement of FAE SC (IH/EMP) need to be fullfill as per clause no. 2 of clarification (to Version 3 of the Scheme) dated Oct. 03, 2017.

1.1.3 Sectors approved for EIA Coordinators (ECs)

a. Assessed as per RA norms – for ECs approved earlier:

S. No.	Name	Earlier approval status (IA/subsequently)		Current approval status (after RA)		Remarks
		Sector	Cat.	Status	Cat.	
In-house						
1	Sandeep Kumar	1	-	-	-	Absent
		38	-	-	-	
		39	-	-	-	
2	Meera Dubey	38	B	Renewed	B	With alert

b. Assessed as per IA norms – for new Sectors of approved ECs and fresh ECs proposed:

S. No.	Name	Sectors			Cat.	Remarks
		Applied	Recommended	Approved		
In-house						
1	Akhilesh Kumar Gupta	1	Yes	Yes	B	Opencast only
		38	Yes	Yes	B	None
Empanelled						
2	Ashok Kumar Rathoure	1	Yes	Yes	A*	None
		9	Yes	Yes	A*	
		21	Yes	Yes	A*	
		39	Yes	Yes	B	

**Though the EIA Coordinators for these sectors were found suitable for Cat. A. However, the organization as a whole was accredited for Cat. B, in view of scoring less than overall 60% marks in their Office Assessment. Thus, the ACO cannot take up Cat. A project in these sectors.*

1.1.4 Functional Areas (FA) approved for Functional Area Experts (FAEs)

a. Assessed as per RA norms – for FAEs approved earlier:

S. No.	Name	Earlier approval status		Approval status after RA		Remarks
		FAs approved in SA/subsequently	Cat.	Status	Cat.	
In-house						
1	Sandeep Kumar	AP	-	-	-	Absent

S. No.	Name	Earlier approval status		Approval status after RA		Remarks
		FAs approved in SA/subsequently	Cat.	Status	Cat.	
		EB	-	-	-	
2	Amen Xavier Kaushal	SE	A	Renewed	A	With alert
3	Meera Dubey	AP	B	Renewed	B	With alert
		SW	B	Renewed	B	
		WP	B	Renewed	B	None
Empanelled						
4	Ajay Mishra	Geo	-	-	-	Left the organization
		HG	-	-	-	
		LU	-	-	-	
5	Goutam Kumar Banerjee	RH	B	Renewed	B	With alert
6	Vikas Pandey	AQ	A	Renewed	A	With alert
		NV	A	Renewed	A	
		SHW	A	Renewed	A	With Obs for SW & HW only

b. Assessed as per IA norms – approved experts for new functional areas and fresh FAEs proposed:

S. No.	Name	Functional Areas			Cat.	Remarks
		Applied	Recommended	Approved		
Empanelled						
1	Ashok Kumar Rathore	EB	Yes	Yes	A	None
		WP	Yes	Yes	B	
2	Rakesh Kumar Singh	Geo	Yes	Yes	B	None
		HG	Yes	Yes	B	
3	Sahil Sood	LU	Yes	Yes	B	None

Note: The following will be communicated to the ACO by NABET-

- Detailed observations and reasons for alerts (if any)
- Results of balance candidates and details of the assessment.

The meeting ended with a vote of thanks to the Chair.

Issued by

(A K Jha)
Senior Director
QCI-NABET

National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

ULTRA TESTING & RESEARCH LABORATORY

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

C-43, SECTOR-88, NOIDA, GAUTAM BUDDHA NAGAR, UTTAR PRADESH, INDIA

in the field of

TESTING

Certificate Number: TC-8198

Issue Date: 16/11/2020 **Valid Until:** 15/11/2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : Ultra Testing & Research Laboratory

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

List of Annexures

Annexure-I: Environment Clearance Letter

Annexure-II: Environment Lab Report

Annexure-I: Environment Clearance Letter

State Level Environment Impact Assessment Authority, Uttar Pradesh

Directorate of Environment, U.P.
Vineet Khand-1, Gomti Nagar, Lucknow - 226 010
Phone : 91-522-2300 541, Fax : 91-522-2300 543
E-mail : doeuplko@yahoo.com
Website : www.seiaaup.in

To,

Shri Awanish Kumar Awasthi,
Uttar Pradesh Expressways Industrial Development Authority,
C-13, 2nd Floor, Paryatan Bhawan,
Vipin Khand, Gomti Nagar,
Lucknow.

Ref. No.....569...../Parya/SEAC/5305-4603/2018 **Date: 25 January, 2020**

Sub: Environmental Clearance for Proposed Development of Gorakhpur Link Expressway through Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh districts in the State of Uttra Pradesh, M/s Uttar Pradesh Expressway Industrial Development Authority (UPEIDA).

Dear Sir,

Please refer to your application/letters 20-12-2018, 19-12-2018, 14-01-2019, 07-12-2019, 02-01-2020 addressed to the Chairman/Secretary, State Level Environment Impact Assessment Authority (SEIAA) and Director, Directorate of Environment Govt. of UP on the subject as above. The State Level Expert Appraisal Committee considered the matter in its meetings held on dated 08/01/2020 and SEIAA in its meeting dated 24/01/2020.

A presentation was made by the project proponent Shri Manoj Kumar Gupta, Superintending Engineer, UPEIDA along with their consultant M/s Kitco Ltd. The proponent, through the documents submitted and the presentation made, informed the committee that:-

1. The environmental clearance is sought for Development of Gorakhpur Link Expressway through Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh districts in the State of Uttra Pradesh, M/s Uttar Pradesh Expressway Industrial Development Authority (UPEIDA).
2. Terms of reference in the matter were issued by SEIAA, U.P. vide letter no. 737/Parya/SEAC/4603/2018, dated 09/03/2019.
3. Public hearing was organized in various districts i.e. Azamgarh (dated 11/09/2019), Gorakhpur (dated 19/09/2019), Sant Kabir Nagar (dated 21/09/2019) & Ambedkar Nagar (dated 13/11/2019) respectively.
4. EIA report submitted by the project proponent on 02/01/2020.
5. Salient features of the project:

Sl. No.	Description	Quantity
1	Total length (km)	91.352
2	Proposed RoW for new alignment (m)	110m
3	Design Speed (Km/hr)	120 on Plain terrain
4	Pavement type	Flexible pavement except at Toll Plaza locations. Rigid pavement at Toll Plaza locations.
5	Number of GAIL pipe line crossings	3
6	Number of major bridges	7
7	Number of minor bridges	13
8	Number of flyovers	7
9	Number of vehicular underpass	16
10	Number of light vehicular underpasses	50
11	Number of pedestrian / cattle underpasses	35
12	Total area of land to be acquired for the project (ha)	1098.87Ha
13	Number of revenue villages through which alignment passes	160
14	Number of toll plazas proposed	2 on Expressway and 3 on Interchange ramps
15	Length of service road proposed (km)	121.292
16	Number of wayside amenities facilities	2 Wayside Amenity
17	Number of toll booth	Toll Booths on Expressway – 20 Toll Booths on Ramps - 18

18	RoW of new alignment proposed in forest area (m)	No forest area comes in the proposed alignment

6. Location of the project:

Sl. No.	Particulars	Details	
1.	Tehsil	Khajani, Sahjanwa, Dhanghata, Budanpur, Phoolpur, Aalapur & Jalalpur	
2.	Districts	Gorakhpur, Sant Kabir Nagar, Azamgarh and Ambedkar Nagar	
3.	State	Uttar Pradesh	
4.	Bounded Latitudes	From	To
5.		26º12'8.22"N	26º43'0.15"N
6.	Bounded Longitudes	From	To
7.		82º44'58.89"E	83º17'32.61"E
8.	Survey of India Topo Sheet No.	G44K15, G44K16, G44L2, G44L3 & G44L6	
9.	Max. Elevation above MSL	80 m	
10.	Distance of Nearest HFL from the project boundary	215 km from the project boundary. Location of HFL from CWC data is at Ghaghara river near Elgin bridge	

7. Chainage wise Details in Districts:

District	Start Chainage	End Chainage	Length (Km)
Gorakhpur	-0+817	42+300	43.117
Sant Kabir Nagar	42+300	46+500	4.200
Ambedkar Nagar	46+500	60+300	13.800
Azamgarh	60+300	71+400	11.100
Ambedkar Nagar	71+400	88+550	17.150
Azamgarh	88+550	90+535	1.985

8. Raw material/fuel consumption details:

Raw Material/Fuel	Quantity per Annum	Unit	Source	Mode of transportation	Distance of Source from Project Site	Type of Linkage (Linkage /Fuel Supply/Agreement/e-auction/MoU/LOA/Captive/Open market/others)
Soil	2,00,00,000	Cum	Near By Borrow area	Road	10 km	The contractor will make the necessary material supply agreement with the authorised vendor during construction period
Cement	68,000	T	Authorized Vendors at local Level	Road	100 km	
Bitumen	40,000	T	Authorized Vendors	Road	628 km	
Steel	9,840	T	Authorized Vendors	Road	100 km	
Stone	15,60,192	M3	Approved Quarry sites	Road	176 km	
Flyash		T	Power plants within 300 km radius	Road	300 km	
Water	93,00,000	KL	Surface Water/Ground Water	Road	---	After obtaining permission from the regulatory authorities

9. The total water consumption for the project is 9300 Million Liters. The water sources during the construction phase will be the surface water sources and their water quality has been assessed.
10. The project proposal falls under category–7(f) of EIA Notification, 2006 (as amended).

Based on the recommendations of the State Level Expert Appraisal Committee Meeting (SEAC) held on 08/01/2020 the State Level Environment Impact Assessment Authority (SEIAA) in its Meeting held 24-01-2020

decided to grant the Environmental Clearance for proposed project along with subject to the effective implementation of the following general & specific conditions:-

General Conditions:

1. A comprehensive EIA shall be undertaken taking into view conditions stipulated in this clearance also and submitted to this Authority within 02 years of commencement of the project. The comprehensive EIA study should also include:
    I. The detailed impact analysis under the scope of work particularly the impact on ambient air quality interpreting the incremental concentration of the various parameters based on air quality models.
    II. The specific target group in the predominant wind directions.
    III. Critical traffic analysis for the construction and the operation phases based on eco-friendly fuels in order to formulate an action plan to keep the surrounding air quality confirming to its present level/the prescribed norms.
    IV. Efforts to utilize the fly ash to the maximum level and the natural clay/soil to the minimum level should be made.
2. Permission for any tree felling shall be taken from Forest Department as per law. In addition to the proposed compensatory plantation (3 Trees planted for every tree cut) it shall be ensured that adequate plantation on both sides of proposed expressway shall be undertaken with shade giving, ecologically friendly, sound absorbing and native species of trees to attenuate probable air and noise pollution. A densely populated green belt in both sides of the expressway shall be developed.
3. The implementation of the environmental management plan should be reviewed every 06 months by the project proponents and the Action Taken Report should be submitted to this authority, UPPCB, and the concerning District Magistrate.
4. The project proponent will set up separate environmental management cell for effective implementation of the EMP etc as well as stipulated environmental safeguards under the supervision of a Senior Experienced Executive.
5. Full support should be extended to concerned officers/authorities by the project proponents during their inspection of the project for monitoring purposes by furnishing full details and action plan, including action taken reports in respect of mitigative measures and other Environmental protection activities.
6. A Six Monthly monitoring report should be submitted to the Authority regarding the implementation of the stipulated conditions.
7. The E.I.A. Authority or any other competent authority may stipulate any other conditions or environmental safeguards, subsequently, if deemed necessary, which should be complied with.
8. First aid centers along the highway should be identified with referral facility for nearby trauma centers for causality management.
9. Regular noise levels should be monitored during construction and operation phase.
10. The date and place of sampling of water testing should be provided along with the quality of water as suitable for drinking purposes alongwith compliance report.

b. **Specific Conditions:**

1. Project proponent shall carryout the analysis for aquatic and soil inhabitant, along with subsurface water samples for environmental parameters/contaminants effecting the ecological system if any. Water and soil test samples shall be collected and be analyzed for at least of two site stations of the river/natural water bodies, distance admeasuring approximately 100 mt apart from one another., and likewise for subsurface water, at least two subsurface water sample shall be collected from both bank side of the river/natural water bodies, trans distance admeasuring approximately 500mt., apart in the traverse journey of Expressway road/bridge width.
2. Project proponent shall assess the impact of Elevated road construction on migratory birds under the direction and supervision of Chief Wildlife Warden of Govt. of U.P.
3. Conservation measures shall be adopted to preserve aquatic and terrestrial fauna.
4. Bio-diversity In terms of flora and fauna shall be maintained.
5. State Environmental Impact Assessment Authority reserves the right to add additional safeguard measures subsequently, if found necessary, and to take action including the revoking of the environmental clearance under the provisions of the Environmental (Protection) Act, 1986, to ensure effective implementation of the suggested safeguard measures in a time bound and satisfactory manner.
6. Status of compliance to the various stipulated environmental conditions and environmental safeguards will be uploaded by the project proponent in its website.

7. Baseline monitoring of air quality to be carried out at 04 additional points in north and west direction at equal distance.
8. Source of water-required water shall be met by rivers and canals wherever it is possible. In no other option borewell may be recommended after obtaining permission competent authority.
9. Felling of trees only after obtaining NOC from the competent authority.
10. Vehicle having PUC certificate should be use.
11. Safe drinking water for labours should be provided.
12. 100 PPM, PM_{10} must be achieved.
13. Continuous online AAQ monitoring at every 100 KM interval to be done.
14. Trauma centre alongwith refreshment centre at every 50 KM to be provided.
15. Drainage line and provision of lighting on both side of the road side should be provided.
16. Traffic light signal at each crossing and at diversion point to be provided.
17. Name of approaching town with mileage sign to be provided.
18. Mining permission from competent authority should also be taken.
19. The construction work shall be undertaken in a manner that the active channel, flow and direction rivers coming under proposal should not be disturbed. The active channel width shall be as certified by Central Water Commission and shall keep into account the flood flows also. The project in all its phases shall ensure that there is no such activity that may affect/result in change of flow (quantity and direction) of river or silting of the river or its tributaries.
20. The use of plastic waste in the construction of the Highway shall be explored. It is suggested that the crusher's dust can be used along with plastic waste in construction of road.
21. The fly ash generating potential of the surrounding areas shall be estimated and its use shall be explored in the proposed expressway.
22. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.
23. The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
24. The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report. (in case of the presence of schedule-I species in the study area).
25. The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State pollution Control Board/ Committee.
26. The project proponent shall obtain the necessary permission from the Central Ground Water Authority, in case of drawl of ground water / from the competent authority concerned in case of drawl of surface water required for the project.
27. All potable water sources near the right of way should be such that they meet drinking water criteria as prescribed. Necessary water recharge facilities shall be constructed near each potable water station.
28. Ground and surface water sources (including rivers and cannels) will be used to meet the water requirement during construction phase of the project road subject to permission from the competent concerned authorities. Ways to minimize the water consumption including use of stored rain water should be explored and included in the comprehensive EIA as indicated in condition no. 1.
29. It shall be ensured that the alignment and other project areas are more than 05 Km away from (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.
30. For any extraction of ground water, prior permission from CGWB shall be taken.
31. Construction material shall be so handled that wastes do not find their way into water bodies. Wastes shall be suitably collected and treated as per standards. Necessary consents shall be obtained from the competent authority in this regards.
32. Separate Environmental Clearances as applicable shall be obtained for any subsidiary activities like rest areas, automobile repair shops etc planned in the project area as per EIA notification.
33. Measures should be taken to protect the ponds along the proposed alignment that may likely to be affected. Wetlands within the study area of the project should be identified and it shall be ensured that

there is no eco-degradation of these wetlands as a result of the project. Details shall be submitted with the comprehensive E.I.A.

34. The CNG station should be established for proper functioning of vehicles to control pollution on the proposed highway.
35. The operation and maintenance of dust monitoring to be reviewed after every six months.
36. Rain water harvesting sites should be developed where ever possible as per norms.
37. The project proponent should obtain necessary permission from the State Irrigation Department before drawing water from the river sources for the purpose of the proposed construction activity. Prior permission from the concerned Authority should be taken for any abstraction of groundwater.
38. Noise barriers should be provided at appropriate locations particularly in the areas where the alignment passes through inhabited areas, so as to ensure that the noise levels do not exceed the prescribed standards and comply with provisions given under Noise Rules 2000 (as amended) for silence zone as defined under the rules.
39. Rest areas with facilities like toilets and refreshment may be included along the expressway.
40. Provision of trauma center/medical facilities is to be provided on this expressway within convenient distance.
41. It is suggested that in between two ways of the road the height of the divider on both side of the green verge should be such that no traffic like motorcycle, cycle, and tractor can cross over. It is also suggested that it will be better if in between two roads strong railing could be provided with sufficient height.
42. Overloading factor should be adequately incorporated during design and construction of the expressway.
43. Adequate drainage structures should be provided along the entire length of expressway so that no conditions of water stagnation are created. Near the settlement areas, drainage structures shall be covered.
44. Relocation of temples and other cultural properties like mosques, schools, hospitals etc, along the proposed alignment, shall be taken-up only after permission from competent authority/local administration.
45. Suitable measures shall be taken to educate highway users on the risk of HIV and human trafficking. Environmental and safety awareness drives through hoardings should also be promoted.
46. On every toll barriers Weigh Bridge is to be installed to check the load of the trucks and restrict the over loaded vehicles and comply as per the capacity design of the road.
47. Separate clearances from the competent authority shall be obtained regarding acquisition of water bodies, forest land, cultural sites etc. Such clearances shall take into consideration minimum impact options.
48. Sand and aggregates shall be obtained from approved quarries only. Borrow areas shall have the approval of the competent authorities.
49. Acquisition of land should be as prescribed under Govt. Rules.
50. Dredged material from road side ditches should be suitably disposed as not to cause any environmental problem. Necessary permission shall be obtained from the competent authority in this regard.
51. Consent for discharge of effluents from workers camp and other construction activity should be obtained from competent authority.
52. Borrow pits should be so selected so as to have minimum loss of productive land.
53. Separate NOC and consent of the UPPCB shall be obtained with regards to asphalt plants, crushers, batching plants, hot mix plants etc.
54. Landfill sites for earth, stone or other construction material shall be duly approved by the competent authority.
55. The alignment shall be so maintained that there is no Archeological or cultural property in the project area.
56. The proposal should conform to Regional Development Plan for the area and if non conforming, suitable permission should be taken before construction from the competent authority.
57. Adequate provision for infrastructure facilities including water supply, fuel and sanitation must be ensured for construction workers during the construction phase of the project in order to avoid any damage to environment.
58. Appropriate measures must be taken while undertaking digging activities to avoid any likely degradation of water quality and other incidents.
59. Borrow pits for earth, quarry sites for road construction material and dump sites must be identified keeping in view the following:
    a) No excavation or dumping on private property is carried out without consent of the owner.



b) No excavation or dumping should be allowed on wetlands, forest areas, protected or prohibited land or other ecologically valuable or sensitive locations.
c) Excavation work should be done in consultation with the Soil Conservation and Watershed Development Agencies working in the area.
d) Construction spoils including bituminous material and other hazardous materials must not be allowed to contaminate water courses and the dump sites for such materials must be secured so that .they should not leach into the ground water, and necessary permission from the UPPCB be obtained.
e) During the earthwork on embankments care is to be taken regarding environmental pollution. The adequate number of sprinkles should be used during the operation period.

60. Adequate precautions and norms should be followed during transportation of the construction material so that it does not affect the environment adversely.
61. Borrow pits and other scars created during the road construction should be properly leveled and treated.
62. Possibility of use of non-conventional energy sources may be explored.
63. Municipal solid waste & Hazardous waste shall not be used in the construction of the express way.
64. Automatic traffic signal is to be provided at all crossing functioning during day and night.
65. During foggy weather the vehicular traffic may be held with parking facilities to avoid accidents.

Concealing factual data and information or submission of false/fabricated data and failure to comply with any of the conditions stipulated in the Prior Environmental Clearance attract action under the provision of Environmental (Protection) Act, 1986.

This Environmental Clearance is subject to ownership of the site by the project proponents in confirmation with approved Master Plan for Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh. In case of violation; it would not be effective and would automatically be stand cancelled.

The project proponent has to ensure that the proposed site in not a part of any no- development zone as required/prescribed/indentified under law. In case of the violation this permission shall automatically deemed to be cancelled. Also, in the event of any dispute on ownership or land use of the proposed site, this Clearance shall automatically deemed to be cancelled.

Further project proponent has to submit the regular 6 monthly compliance report regarding general & specific conditions as specified in the E.C. letter and comply the provision of EIA notification 2006 (as Amended).

These stipulations would be enforced among others under the provisions of Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Public Liability (Insurance) Act, 1991 and EIA Notification, 2006 including the amendments and rules made thereafter.

(Ashish Tiwari)
Member Secretary, SEIAA

No...../Parya/SEAC/5305-4603/2019 Dated: As above

Copy with enclosure for Information and necessary action to:

1. The Principal Secretary, Department of Environment, Govt. of Uttar Pradesh, Lucknow.
2. Advisor, IA Division, Ministry of Environment, Forests & Climate Change, Govt. of India, Indira Paryavaran Bhawan, Jor Bagh Road, Aliganj, New Delhi.
3. Additional Director, Regional Office, Ministry of Environment & Forests, (Central Region), Kendriya Bhawan, 5th Floor, Sector-H, Aliganj, Lucknow.
4. District Magistrate Gorakhpur, Sant Kabir Nagar, Ambedkar Nagar and Azamgarh.
5. The Member Secretary, U.P. Pollution Control Board, TC-12V, Paryavaran Bhawan, Vibhuti Khand, Gomti Nagar, Lucknow.
6. Copy to Web Master/ guard file.

(Ashish Tiwari)
Member Secretary, SEIAA

Annexure-II: Lab Report

Quarter	Month
I	September 2021 to November 2021
II	December 2021 to February 2022
III	March 2022 to May 2022
IV	June 2022 to August 2022

Annexure-II: Lab Report

Quarter	Month
I	September 2021 to November 2021

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
Laboratory: C43, Sector-88, Phase-II, Noida, U.P.
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Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02122021-01 Issue Date: 02/12/2021

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ1 Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)
Analysis Duration 05/09/2021 To 02/12/2021	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3) IS:5182(Part-23	Particulate Matter PM2.5 (µg /m^3) IS:5182(Part-24	Sulphur Dioxide SO_2 (µg /m^3) IS:5182(Part 2)	Nitrogen Dioxide NO_2 (µg /m^3) IS:5182(Part-6)	Carbon monoxide CO (mg /m^3) IS:5182(Part-X)
1	01/09/2021	77.13	39.85	11.31	21.94	0.60
2	04/09/2021	76.05	40.79	11.77	20.83	0.58
3	08/09/2021	74.50	37.68	10.59	20.67	0.59
4	11/09/2021	73.44	38.00	12.52	21.86	0.56
5	15/09/2021	75.52	37.55	10.97	20.22	0.56
6	18/09/2021	72.47	39.88	11.18	21.21	0.61
7	22/09/2021	71.03	40.65	9.76	19.49	0.58
8	25/09/2021	77.79	38.46	11.27	21.56	0.60
9	29/09/2021	84.00	41.15	10.92	21.90	0.59
10	01/10/2021	86.37	42.54	11.20	20.69	0.58
11	05/10/2021	86.55	43.71	11.87	21.38	0.60
12	08/10/2021	83.16	42.45	10.59	18.79	0.56
13	12/10/2021	81.84	40.92	10.17	19.22	0.55
14	15/10/2021	85.14	43.00	10.09	21.27	0.60
15	19/10/2021	85.51	42.12	11.78	21.04	0.59
16	22/10/2021	84.47	40.08	11.23	20.57	0.61
17	26/10/2021	83.27	42.48	10.38	21.38	0.58
18	01/11/2021	82.68	44.72	10.17	20.87	0.56
19	05/11/2021	83.94	43.24	9.67	21.52	0.59
20	08/11/2021	85.64	42.17	10.52	21.10	0.59
21	12/11/2021	83.04	41.09	11.13	19.70	0.60
22	15/11/2021	83.91	42.17	11.50	20.54	0.56
23	19/11/2021	85.21	41.33	12.50	21.26	0.55
24	22/11/2021	83.40	41.49	11.31	22.22	0.58
Minimum		**71.03**	**37.55**	**9.67**	**18.79**	**0.55**
Maximum		**86.55**	**44.72**	**12.52**	**22.22**	**0.61**
Average		**81.09**	**41.15**	**11.02**	**20.88**	**0.58**
98th Percentile		**86.47**	**44.25**	**12.51**	**22.09**	**0.61**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

1 The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2 This test report will not be used for any publicity/legal purpose
3 The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4 The Report can not be used as evidence in a court of law without the written approval of the lab.

Archana
Checked By

For Ultra Testing & Research Laboratory
(Authorized Signatory)

Assuring you of best our services at all times.

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Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02122021-02 Issue Date: 02/12/2021

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ 2 CH -36+800
Analysis Duration 05/09/2021 To 02/12/2021	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	01/09/2021	73.18	39.99	11.09	21.60	0.55
2	04/09/2021	76.31	37.31	10.78	18.39	0.56
3	08/09/2021	75.09	38.41	9.84	21.16	0.55
4	11/09/2021	74.13	38.99	12.71	22.31	0.58
5	15/09/2021	76.11	39.56	11.07	20.34	0.55
6	18/09/2021	73.17	35.51	9.76	19.49	0.58
7	22/09/2021	71.58	37.49	10.41	18.48	0.58
8	25/09/2021	76.22	36.17	11.37	22.05	0.57
9	29/09/2021	79.48	40.16	11.02	21.46	0.59
10	01/10/2021	85.21	41.96	10.88	20.44	0.56
11	05/10/2021	81.92	43.09	11.12	20.36	0.58
12	08/10/2021	82.00	40.14	10.97	19.66	0.55
13	12/10/2021	81.97	42.04	10.68	21.70	0.56
14	15/10/2021	82.39	42.05	11.19	21.60	0.59
15	19/10/2021	84.00	43.27	11.06	21.72	0.54
16	22/10/2021	85.02	44.23	10.91	22.17	0.58
17	26/10/2021	82.55	42.76	10.90	23.51	0.53
18	01/11/2021	84.91	41.82	12.25	22.18	0.57
19	05/11/2021	79.96	41.46	11.17	21.66	0.58
20	08/11/2021	85.39	42.48	11.75	22.53	0.59
21	12/11/2021	82.43	41.86	11.25	21.72	0.55
22	15/11/2021	83.17	43.09	11.94	22.25	0.56
23	19/11/2021	83.88	43.21	11.73	21.69	0.56
24	22/11/2021	80.27	41.40	11.15	22.36	0.58
Minimum		**71.58**	**35.51**	**9.76**	**18.39**	**0.53**
Maximum		**85.39**	**44.23**	**12.71**	**23.51**	**0.59**
Average		**80.01**	**40.77**	**11.13**	**21.28**	**0.57**
98th Percentile		**85.31**	**43.79**	**12.50**	**23.06**	**0.59**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling .The customer asked for the above tests only.
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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02122021-03 Issue Date: 02/12/2021

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ3 Chaudia Masan
Analysis Duration : 05/09/2021 To 02/12/2021	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3) IS:5182(Part-23	Particulate Matter PM2.5 (µg /m^3) IS:5182(Part-24	Sulphur Dioxide SO_2 (µg /m^3) IS:5182(Part-2)	Nitrogen Dioxide NO_2 (µg /m^3) IS:5182(Part-6)	Carbon monoxide CO (mg /m^3) IS:5182(Part-X)
1	01/09/2021	75.09	35.64	11.20	22.09	0.59
2	04/09/2021	77.79	37.20	9.64	20.18	0.57
3	08/09/2021	74.02	35.29	10.94	21.28	0.56
4	11/09/2021	73.49	39.31	11.83	18.54	0.59
5	15/09/2021	74.61	38.16	9.78	19.53	0.56
6	18/09/2021	75.52	37.55	10.01	20.73	0.54
7	22/09/2021	73.50	38.24	10.80	21.75	0.58
8	25/09/2021	75.15	36.93	11.75	20.49	0.56
9	29/09/2021	77.15	37.52	9.62	22.13	0.59
10	01/10/2021	81.55	38.85	10.43	21.49	0.60
11	05/10/2021	84.66	43.82	11.78	20.49	0.59
12	08/10/2021	82.19	39.16	10.38	20.54	0.54
13	12/10/2021	85.22	40.08	10.59	21.05	0.55
14	15/10/2021	82.58	38.08	12.27	18.56	0.58
15	19/10/2021	83.34	41.46	10.75	21.84	0.55
16	22/10/2021	80.07	41.96	10.88	22.85	0.58
17	26/10/2021	83.16	41.37	10.18	20.15	0.53
18	01/11/2021	80.88	40.44	11.26	20.84	0.56
19	05/11/2021	79.73	42.61	10.86	21.60	0.58
20	08/11/2021	81.84	39.42	9.77	22.31	0.59
21	12/11/2021	80.96	40.91	11.51	20.18	0.56
22	15/11/2021	81.59	42.08	12.31	20.12	0.56
23	19/11/2021	84.91	42.25	10.74	20.16	0.54
24	22/11/2021	81.78	41.73	10.85	21.95	0.55
Minimum		**73.49**	**35.29**	**9.62**	**18.54**	**0.53**
Maximum		**85.22**	**43.82**	**12.31**	**22.85**	**0.60**
Average		**79.62**	**39.59**	**10.84**	**20.87**	**0.57**
98th Percentile		**85.08**	**43.26**	**12.29**	**22.60**	**0.60**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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Archana
Checked By

For Ultra Testing & Research Laboratory
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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02122021-04 Issue Date: 02/12/2021

ISSUED TO . GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ4 Daswat Pur Ethiya
Analysis Duration 05/09/2021 To 02/12/2021	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/09/2021	77.05	39.79	11.04	21.86	0.58
2	05/09/2021	75.51	38.39	10.31	19.95	0.56
3	09/09/2021	74.72	35.64	11.19	21.05	0.55
4	12/09/2021	72.91	39.65	9.73	18.68	0.59
5	16/09/2021	76.59	37.23	10.46	22.28	0.58
6	19/09/2021	76.63	36.61	10.96	20.87	0.53
7	23/09/2021	71.65	37.73	11.74	18.39	0.54
8	26/09/2021	73.70	35.99	12.15	20.82	0.55
9	30/09/2021	77.82	40.81	10.28	21.90	0.59
10	02/10/2021	83.08	42.18	11.11	23.85	0.58
11	06/10/2021	80.24	40.33	12.31	21.18	0.60
12	09/10/2021	82.88	42.08	10.49	22.17	0.55
13	13/10/2021	85.88	44.62	9.60	20.09	0.56
14	16/10/2021	84.11	40.56	11.83	18.89	0.55
15	20/10/2021	83.16	42.64	10.32	19.78	0.54
16	23/10/2021	82.89	38.88	11.14	22.25	0.58
17	27/10/2021	85.52	41.71	10.84	23.39	0.53
18	02/11/2021	85.34	41.20	11.64	19.52	0.57
19	06/11/2021	83.35	43.36	10.01	18.26	0.58
20	09/11/2021	83.80	40.62	11.01	21.89	0.59
21	13/11/2021	82.50	44.69	11.90	22.00	0.55
22	16/11/2021	82.27	39.85	12.15	20.45	0.57
23	20/11/2021	80.10	39.21	10.30	22.13	0.55
24	23/11/2021	83.29	42.49	11.10	21.72	0.56
Minimum		**71.65**	**35.64**	**9.60**	**18.26**	**0.53**
Maximum		**85.88**	**44.69**	**12.31**	**23.85**	**0.60**
Average		**80.21**	**40.26**	**10.98**	**20.97**	**0.56**
98th Percentile		**85.71**	**44.66**	**12.24**	**23.64**	**0.60**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02122021-05 Issue Date: 02/12/2021

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SII 72 and SII5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ5 Mahadev Pur
Analysis Duration 05/09/2021 To 02/12/2021	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/09/2021	77.31	39.29	11.15	22.18	0.57
2	05/09/2021	74.93	37.05	9.60	20.09	0.52
3	09/09/2021	74.99	36.42	10.47	19.52	0.55
4	12/09/2021	73.18	40.42	9.84	18.46	0.59
5	16/09/2021	76.00	37.57	10.85	21.30	0.56
6	19/09/2021	73.07	36.11	11.08	20.28	0.53
7	23/09/2021	71.92	39.34	10.75	19.27	0.55
8	26/09/2021	73.97	36.77	11.84	22.26	0.56
9	30/09/2021	77.73	38.87	10.05	20.53	0.59
10	02/10/2021	82.05	39.96	9.70	22.87	0.60
11	06/10/2021	79.65	42.79	11.73	20.95	0.58
12	09/10/2021	79.21	40.68	11.02	21.92	0.55
13	13/10/2021	81.84	39.23	9.90	21.23	0.57
14	16/10/2021	83.51	40.47	11.52	18.48	0.54
15	20/10/2021	80.04	37.91	10.71	20.84	0.53
16	23/10/2021	83.57	40.08	11.39	22.38	0.58
17	27/10/2021	81.13	39.94	10.27	20.06	0.53
18	02/11/2021	83.40	40.64	11.04	18.37	0.56
19	06/11/2021	79.84	42.67	10.32	21.44	0.58
20	09/11/2021	81.43	39.65	9.73	20.35	0.59
21	13/11/2021	78.47	38.59	11.60	18.60	0.56
22	16/11/2021	82.52	38.05	11.15	20.78	0.56
23	20/11/2021	79.51	40.81	10.01	22.45	0.54
24	23/11/2021	81.57	39.51	9.69	21.01	0.55
Minimum		**71.92**	**36.11**	**9.60**	**18.37**	**0.52**
Maximum		**83.57**	**42.79**	**11.84**	**22.87**	**0.60**
Average		**78.78**	**39.28**	**10.64**	**20.65**	**0.56**
98th Percentile		**83.54**	**42.73**	**11.79**	**22.68**	**0.59**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02122021-06 Issue Date: 02/12/2021

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ6 Mutkallipur (End Of Alignment)
Analysis Duration 05/09/2021 To 02/12/2021	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/09/2021	74.62	39.63	9.75	20.12	0.55
2	05/09/2021	76.46	37.81	9.86	20.41	0.53
3	09/09/2021	77.39	35.06	10.73	18.55	0.52
4	12/09/2021	75.57	37.36	9.68	22.10	0.58
5	16/09/2021	74.13	37.07	11.11	20.89	0.57
6	19/09/2021	73.34	36.46	11.33	19.87	0.53
7	23/09/2021	72.19	38.42	10.32	20.51	0.54
8	26/09/2021	75.52	35.84	9.73	22.40	0.56
9	30/09/2021	85.16	43.00	10.30	20.30	0.58
10	02/10/2021	82.30	42.85	11.75	23.19	0.59
11	06/10/2021	86.24	44.39	10.75	21.09	0.58
12	09/10/2021	86.31	41.44	10.86	23.36	0.55
13	13/10/2021	88.40	48.41	10.56	22.10	0.56
14	16/10/2021	85.03	45.92	11.78	20.66	0.54
15	20/10/2021	84.50	42.46	10.55	22.62	0.53
16	23/10/2021	85.94	44.25	11.78	21.23	0.58
17	27/10/2021	84.91	43.93	10.88	22.73	0.53
18	02/11/2021	85.51	42.97	10.81	22.89	0.57
19	06/11/2021	87.26	48.06	12.23	21.77	0.55
20	09/11/2021	84.41	43.28	11.31	21.57	0.59
21	13/11/2021	85.57	43.00	12.47	23.88	0.53
22	16/11/2021	84.48	41.39	11.40	21.47	0.55
23	20/11/2021	83.03	42.79	10.35	22.06	0.53
24	23/11/2021	86.49	43.03	11.52	21.81	0.56
Minimum		**72.19**	**35.06**	**9.68**	**18.55**	**0.52**
Maximum		**88.40**	**48.41**	**12.47**	**23.88**	**0.59**
Average		**81.87**	**41.62**	**10.91**	**21.57**	**0.55**
98th Percentile		**87.88**	**48.25**	**12.36**	**23.64**	**0.59**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-06092021-01 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.	
Sample Drawn On	: 04/09/2021	
Sample Drawn By	: UTRL	
Sample Description	: Ground Water	
Sampling Location	: GW-1 Doharia Basdeo	GW-2 Bidhanpur
Block/District	: Khajni Block /Gorakhpur	Khajni Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)	
Sample Quantity	: 2.0 Litre	
Analysis Duration	: 06/09/2021 to 11/09/2021	

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-1	GW-2			
1	pH	IS:3025(Part-11)	7.54	7.09	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	344	284	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	121.60	104.00	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	9.72	5.83	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	31.31	19.57	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	0.28	0.25	mg/l	0.3	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	0.35	0.67	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	563	489	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-06092021-0 (Page 1 of 2)

TECHNICAL MANAGER

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TC-8198

Contd. To report W-06092021-0 (Page 2 of 2)

16	Sulphate (as SO_4)	IS:3025(Part-24)	14.35	13.66	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	9.54	2.05	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	328	316	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	0.05

End Of Report

Note:-

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Vinay.
Checked By

For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

(Authorized Signatory)

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TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-06092021-01 **Issue Date: 11/09/2021**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 04/09/2021
Sample Drawn By : UTRL
Sample Description : Ground Water
Sampling Location : GW-1 : Doharia Basdeo — GW-2 Bidhanpur
Block/District : Khajni Block /Gorakhpur — Khajni Block /Gorakhpur
Analysis Duration : 06/09/2021 to 11/09/2021

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW-1	GW-2		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100m	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-06092021-02 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 04/09/2021
Sample Drawn By : UTRL
Sample Description : Ground Water
Sampling Location : GW-3 Mahadevpur | GW-4 Muskarai
Block/District : Atraulia Block /Azamgarh | Bhiyawan Block /Ambedkar Nagar
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 06/09/2021 to 11/09/2021

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-3	GW-4			
1	pH	IS:3025(Part-11)	7.37	7.13	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	260	344	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	84.80	113.60	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	11.66	14.58	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	13.70	15.65	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	0.12	0.17	mg/l	0.3	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	<0.1	1.44	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	443	522	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-06092021-0 (Page 1 of 2)

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TC-8198

16	Sulphate (as SO_4)	IS:3025(Part-24)	10.76	12.81	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	0.16	0.24	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	288	336	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	0.05

End Of Report

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Checked By

For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

(Authorized Signatory)

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TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-06092021-02 **Issue Date: 11/09/2021**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 04/09/2021
Sample Drawn By : UTRL
Sample Description : Ground Water

Sampling Location	GW-3	GW-4
	: Mahadevpur	Muskarai
Block/District	: Atraulia Block /Azamgarh	Bhiyawan Block /Ambedkar Nagar
Analysis Duration	: 06/09/2021 to 11/09/2021	

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW-3	GW-4		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100ml	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

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TC-8198

TEST REPORT

Noise Report

Report Code: N-16092021-01 **Issue Date: 21/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Proponent	: M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	: Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	: 12/09/2021 To 13/09/2021
Sample Drawn By	: UTRL
Sample Description	: Ambient Noise
Sampling Protocol	: UTRL/STP/Noise
Weather Condition	: Clear
Monitoring Duration	: 24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)	56.4	41.7	55.3	**65.0**	**55.0**	**Commercial**
2	Akona Khurd Ch-49+800	51.1	40.1	50.8	**55.0**	**45.0**	**Residential**
3	Chaudia Masan	50.8	37.0	49.8	**55.0**	**45.0**	**Residential**
*Day Time		Leq(6.00AM TO 10.00 PM)					
*Night Time		Leq(10.00PM TO 6.00 AM)					

Note:- **End Of Report**

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TC-8198

TEST REPORT

Noise Report

Report Code: N-16092021-02 **Issue Date: 21/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Proponent	: M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	: Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	: 13/09/2021 To 14/09/2021
Sample Drawn By	: UTRL
Sample Description	: Ambient Noise
Sampling Protocol	: UTRL/STP/Noise
Weather Condition	: Clear
Monitoring Duration	: 24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Daswat Pur Ethiya	51.4	39.3	50.8	**55.0**	**45.0**	**Residential**
2	Mahadevpur	52.2	38.1	51.2	**55.0**	**45.0**	**Residential**
3	Mutkallipur (End Of Alignment)	61.8	41.8	60.2	**65.0**	**55.0**	**Commercial**
*Day Time		Leq(6.00AM TO 10.00 PM)					
*Night Time		Leq(10.00PM TO 6.00 AM)					

Note:- **End Of Report**

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TC-8198

TEST REPORT

Soil Sample Analysis
Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-06092021-01 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 04/09/2021
Sample Drawn By : UTRL
Sample Description : Soil
Sample Location : SQ-1 Agricultural land at Bhagwanpur Bhakra Tiwari; SQ-2 Bharsi; SQ-3 Agricultural land at AkaunaKhurd
Sample Quantity : 2.0 kg
Analysis Duration : 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Units	Location			Test Method
			SQ-1	SQ-2	SQ-3	
1	Texture	-	Clay Loam	Sandy Clay	Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	36.30	47.74	43.46	UTRL/LAB/SOIL/SOP/05
	Clay	%	32.42	38.70	36.24	UTRL/LAB/SOIL/SOP/05
	Silt	%	31.28	13.56	20.30	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)	-	7.66	7.24	7.43	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	486.6	682.6	642.2	IS: 14767
4	Potassium (as K)	mg/kg	222.83	232.00	263.57	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	325.44	312.73	389.87	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4243.45	4139.53	4584.61	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	554.49	757.64	551.59	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	1.25	1.17	1.45	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	33.46	31.70	35.59	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.083	0.079	0.094	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	77.08	66.28	90.42	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.28	1.30	1.28	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.08	0.82	1.56	IS: 2720 (Part-22)
14	Porosity	%	41.24	42.02	35.98	UTRL/LAB/SOIL/SOP/17

End Of Report

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TEST REPORT

Soil Sample Analysis
Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-06092021-02 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 04/09/2021
Sample Drawn By : UTRL
Sample Description : Soil
Sample Location : SQ-4 Katohi SQ-5 Shivpal
Sample Quantity : 2.0 kg
Analysis Duration : 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Units	Location		Test Method
			SQ-4	SQ-5	
1	Texture	-	Sandy Clay	Silt Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	46.88	18.57	UTRL/LAB/SOIL/SOP/05
	Clay	%	39.41	30.70	UTRL/LAB/SOIL/SOP/05
	Silt	%	13.71	50.73	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)	-	7.89	6.85	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	328.2	274.5	IS: 14767
4	Potassium (as K)	mg/kg	116.14	237.04	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	193.39	330.28	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4190.66	3954.47	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	505.29	901.47	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	0.75	1.23	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	31.36	46.58	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.056	0.117	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	59.28	74.37	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.32	1.27	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.06	1.35	IS: 2720 (Part-22)
14	Porosity	%	41.84	39.89	UTRL/LAB/SOIL/SOP/17

End Of Report

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-06092021-04 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: GhaghraNadi at Kamhariya Ghat
Block/District	: Belghat Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.45	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	31.2	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	11.4	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	243.5	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	22	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	128	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	32.00	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	11.66	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	19.57	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	1.06	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	151	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-06092021-04

TECHNICAL MANAGER

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Contd. To report Code: WW-06092021-04

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	128.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	24.59	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.48	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	13.70	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	4.42	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.53	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	20.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-06092021-04 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: GhaghraNadi at Kamhariya Ghat
Block/District	: Belghat Block /Ambedkar Nagar
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	464	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-06092021-05 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: ChotiSaryu at ItoriKhalispur
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.80	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	30.4	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	11.4	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	109.7	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	22	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	12	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	8.1	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	5.20	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	4.13	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	7.83	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.90	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	68	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-06092021-05

TECHNICAL MANAGER

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TC-8198

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	30.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	21.86	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	2.58	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	5.48	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	1.77	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.53	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-06092021-05 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: ChotiSaryu at ItoriKhalispur
Block/District	: Jalal Pur Block /Ambedkar Nagar
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	246	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-06092021-06 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Tons River at Chodahprass
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.89	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5 8.5
2	Temperature	IS:3025(Part-09)	31.2	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	16.2	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	164.5	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	28	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	30	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.6	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	12.00	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	4.86	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	8.81	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	5.91	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	102	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-06092021-06

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Website: http://www.ultralabnoida.com

TC-8198

Contd. To report Code: WW-06092021-06

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	50.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	29.89	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.46	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	6.16	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	2.05	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.62	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	24.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Vinay
Checked By

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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Ph.: No.: +91-9971912476, 9350952231
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Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-06092021-06 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 05/09/2021
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Tons River at Chodahprass
Block/District : Jalal Pur Block /Ambedkar Nagar
Analysis Duration : 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	422	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
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Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-06092021-07 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 05/09/2021
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Majohi River
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.95	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	30.8	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	36.3	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	304.8	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	80	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	80	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	4.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.4	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	16.00	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	12.64	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	15.65	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	4.49	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.17	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	189	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-06092021-07

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

Contd. To report Code: WW-06092021-07

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	92.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	36.55	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.21	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	12.52	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	4.04	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	3.91	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	32.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
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For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

Checked By

(Authorized Signatory)

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-06092021-07 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Majohi River
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	612	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Ciass B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
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3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-06092021-01 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 05/09/2021
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Sowvan Nala
Block/District : Piprauli Block /Gorakhpur
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.58	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	30.8	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	12.8	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	329.5	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	38	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	72	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	5.0	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	6.4	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	25.60	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	11.66	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	27.40	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.87	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.25	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	214	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-06092021-01

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

Contd. To report Code: WW-06092021-01

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	112.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	36.21	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	2.35	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	19.18	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	0.15	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	6.39	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	7.14	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	24.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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For ULTRA TESTING & RESEARCH LABORATORY

Vinay.
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-06092021-01 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 05/09/2021
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Sowvan Nala
Block/District : Piprauli Block /Gorakhpur
Analysis Duration : 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	1872	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-06092021-02 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Aami Nadi at Dadauna
Block/District	: Khajni Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pII	IS.3025(Part-11)	6.86	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	30.2	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	23.8	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	303.2	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	32	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	76	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.6	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	17.60	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	10.69	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	17.61	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	1.13	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	188	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-06092021-02

TECHNICAL MANAGER

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TC-8198

Contd. To report Code: WW-06092021-02

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	88.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	38.08	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.69	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	14.09	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	4.54	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.54	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	20.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
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For ULTRA TESTING & RESEARCH LABORATORY

Vinay
Checked By

(Authorized Signatory)

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-06092021-02 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Aami Nadi at Dadauna
Block/District	: Khajni Block /Gorakhpur
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	488	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
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Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

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Ultra Lab

TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-06092021-03 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Kuwano River at Trilokpur
Block/District	: Belghat Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.13	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	30.6	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	13.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	325.8	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	29	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	112	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.9	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	33.60	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	6.80	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	13.70	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.70	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.35	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	202	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-06092021-03

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Website: http://www.ultralabnoida.com

TC-8198

Contd. To report Code: WW-06092021-03

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	112.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	14.00	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.43	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	9.59	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	3.09	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.72	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
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For ULTRA TESTING & RESEARCH LABORATORY

Viray.
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-06092021-03 **Issue Date: 11/09/2021**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 05/09/2021
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Kuwano River at Trilokpur
Block/District	: Belghat Block /Gorakhpur
Analysis Duration	: 06/09/2021 To 11/09/2021

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	342	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
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Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

Assuring you of best our services at all times.

Annexure-II: Lab Report

Quarter	Month
II	December 2021 to February 2022

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
Laboratory: C43, Sector-88, Phase-II, Noida, U.P.
Ph. No.: +91-9971912476, 9350952231
E-mail: ultraresearchlab@gmail.com
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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02032022-01 Issue Date: 02/03/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ1 Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)
Analysis Duration 05/12/2021 To 02/03/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	01/12/2021	87.98	50.89	13.35	23.76	0.67
2	04/12/2021	86.41	46.75	12.79	25.18	0.58
3	08/12/2021	89.96	48.60	14.59	23.68	0.67
4	11/12/2021	91.85	49.63	14.75	23.42	0.66
5	15/12/2021	90.39	54.57	15.00	24.79	0.64
6	18/12/2021	92.09	48.18	13.20	24.23	0.71
7	22/12/2021	86.31	47.23	15.11	23.10	0.63
8	25/12/2021	95.44	57.09	13.61	24.22	0.67
9	29/12/2021	91.67	48.60	14.87	25.34	0.66
10	01/01/2022	88.68	47.33	13.06	24.23	0.67
11	05/01/2022	89.81	48.56	13.30	23.86	0.63
12	08/01/2022	86.48	47.91	13.12	23.54	0.61
13	12/01/2022	95.39	52.57	14.37	23.54	0.71
14	15/01/2022	90.60	55.46	12.55	24.61	0.60
15	19/01/2022	92.32	49.78	13.17	22.34	0.68
16	22/01/2022	88.26	47.33	12.50	24.23	0.67
17	26/01/2022	92.95	48.60	13.48	22.94	0.62
18	29/01/2022	88.84	53.22	16.05	25.00	0.71
19	02/02/2022	87.98	48.30	14.19	23.20	0.67
20	05/02/2022	91.44	47.84	13.93	24.06	0.63
21	09/02/2022	88.43	50.17	12.75	23.43	0.60
22	12/02/2022	91.34	50.13	13.15	24.88	0.56
23	16/02/2022	86.07	44.75	14.30	23.71	0.55
24	19/02/2022	87.16	48.28	13.09	23.54	0.62
Minimum		**86.07**	**44.75**	**12.50**	**22.34**	**0.55**
Maximum		**95.44**	**57.09**	**16.05**	**25.34**	**0.71**
Average		**89.91**	**49.66**	**13.76**	**23.95**	**0.64**
98th Percentile		**95.41**	**56.34**	**15.62**	**25.27**	**0.71**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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4 The Report can not be used as evidence in a court of law without the written approval of the lab.

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For Ultra Testing & Research Laboratory
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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02032022-02 Issue Date: 02/03/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ 2 CH -36+800
Analysis Duration 05/12/2021 To 02/03/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/12/2021	85.09	43.18	11.59	20.94	0.59
2	05/12/2021	84.59	46.38	11.75	22.54	0.66
3	09/12/2021	85.02	43.59	11.81	21.91	0.58
4	12/12/2021	86.07	46.05	11.78	21.28	0.61
5	16/12/2021	83.85	45.15	12.75	21.27	0.67
6	19/12/2021	84.10	44.42	11.80	21.89	0.58
7	23/12/2021	86.25	45.28	12.23	20.02	0.59
8	26/12/2021	83.30	43.80	13.15	22.92	0.61
9	30/12/2021	86.66	46.93	12.26	23.66	0.67
10	02/01/2022	85.64	43.89	12.76	21.84	0.66
11	06/01/2022	85.88	46.01	12.71	22.43	0.58
12	09/01/2022	84.67	44.45	12.97	23.14	0.56
13	13/01/2022	88.65	44.32	11.64	22.22	0.55
14	16/01/2022	86.06	44.09	12.16	23.54	0.67
15	20/01/2022	86.13	44.37	11.34	22.27	0.54
16	23/01/2022	87.63	47.41	12.28	23.33	0.62
17	27/01/2022	85.88	45.09	11.33	23.10	0.54
18	30/01/2022	86.07	44.32	13.18	23.15	0.55
19	03/02/2022	88.03	45.95	12.31	22.54	0.60
20	06/02/2022	88.06	46.57	11.86	22.04	0.60
21	10/02/2022	85.51	45.35	11.40	22.67	0.59
22	13/02/2022	86.67	47.82	13.08	22.41	0.56
23	17/02/2022	88.22	45.61	11.36	22.59	0.61
24	20/02/2022	84.78	45.61	12.48	21.84	0.59
Minimum		**83.30**	**43.18**	**11.33**	**20.02**	**0.54**
Maximum		**88.65**	**47.82**	**13.18**	**23.66**	**0.67**
Average		**85.95**	**45.24**	**12.17**	**22.32**	**0.60**
98th Percentile		**88.45**	**47.63**	**13.17**	**23.61**	**0.67**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02032022-03 Issue Date: 02/03/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ3 Chaudia Masan
Analysis Duration 05/12/2021 To 02/03/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	01/12/2021	85.57	43.86	11.21	23.88	0.61
2	04/12/2021	84.86	43.27	11.64	21.32	0.57
3	08/12/2021	87.57	44.00	13.10	22.21	0.61
4	11/12/2021	86.25	43.56	12.51	22.27	0.61
5	15/12/2021	83.57	43.49	12.64	23.86	0.66
6	18/12/2021	87.60	45.09	11.61	23.66	0.56
7	22/12/2021	86.41	43.83	13.06	23.91	0.61
8	25/12/2021	87.40	47.33	13.62	22.75	0.67
9	29/12/2021	88.53	48.90	12.23	23.23	0.61
10	01/01/2022	85.94	45.30	12.97	23.14	0.60
11	05/01/2022	89.96	47.92	13.42	23.89	0.59
12	08/01/2022	89.11	48.60	12.37	25.16	0.62
13	12/01/2022	84.50	39.74	10.50	20.87	0.55
14	15/01/2022	82.58	38.08	12.27	18.56	0.58
15	19/01/2022	83.34	41.46	10.75	21.84	0.55
16	22/01/2022	80.07	41.96	10.88	22.85	0.58
17	26/01/2022	83.16	41.37	10.18	20.15	0.53
18	29/01/2022	80.88	40.44	11.26	20.84	0.56
19	02/02/2022	79.73	42.61	10.86	21.60	0.58
20	05/02/2022	81.84	39.42	9.77	22.31	0.59
21	09/02/2022	80.96	40.91	11.51	20.18	0.56
22	12/02/2022	81.59	42.08	12.31	20.12	0.56
23	16/02/2022	84.91	42.25	10.74	20.16	0.54
24	19/02/2022	81.78	41.73	10.85	21.95	0.55
Minimum		**79.73**	**38.08**	**9.77**	**18.56**	**0.53**
Maximum		**89.96**	**48.90**	**13.62**	**25.16**	**0.67**
Average		**84.51**	**43.22**	**11.76**	**22.11**	**0.58**
98th Percentile		**89.57**	**48.76**	**13.53**	**24.58**	**0.66**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02032022-04 Issue Date: 02/03/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ4 Daswat Pur Ethiya
Analysis Duration 05/12/2021 To 02/03/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/12/2021	86.74	42.08	12.45	24.96	0.60
2	05/12/2021	85.21	43.89	11.78	24.46	0.56
3	09/12/2021	86.36	44.45	11.59	22.59	0.62
4	12/12/2021	87.79	46.05	12.20	23.90	0.59
5	16/12/2021	87.71	44.50	13.39	24.88	0.67
6	19/12/2021	84.83	46.11	12.62	24.72	0.56
7	23/12/2021	85.76	44.40	12.91	25.31	0.70
8	26/12/2021	87.44	43.94	13.32	23.97	0.55
9	30/12/2021	85.02	46.38	12.17	23.66	0.62
10	02/01/2022	83.96	45.24	13.61	22.84	0.61
11	06/01/2022	86.91	46.44	11.25	22.92	0.59
12	09/01/2022	86.06	45.59	13.19	25.69	0.70
13	13/01/2022	88.81	46.14	11.21	24.74	0.67
14	16/01/2022	85.26	44.81	13.32	24.72	0.74
15	20/01/2022	86.13	46.98	12.33	24.16	0.62
16	23/01/2022	87.76	45.79	12.16	24.65	0.58
17	27/01/2022	85.52	44.65	11.94	25.41	0.70
18	30/01/2022	85.76	45.71	12.48	22.48	0.61
19	03/02/2022	90.11	47.89	12.91	24.18	0.64
20	06/02/2022	88.31	46.55	12.62	24.16	0.67
21	10/02/2022	88.65	45.18	12.48	25.21	0.61
22	13/02/2022	81.33	43.89	12.76	22.59	0.57
23	17/02/2022	86.12	46.05	13.06	24.79	0.68
24	20/02/2022	84.16	43.37	13.43	24.03	0.70
Minimum		**81.33**	**42.08**	**11.21**	**22.48**	**0.55**
Maximum		**90.11**	**47.89**	**13.61**	**25.69**	**0.74**
Average		**86.32**	**45.25**	**12.55**	**24.21**	**0.63**
98th Percentile		**89.51**	**47.47**	**13.53**	**25.56**	**0.72**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02032022-05 Issue Date: 02/03/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326 AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ5 Mahadev Pur
Analysis Duration 05/12/2021 To 02/03/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/12/2021	82.26	42.61	11.55	21.60	0.56
2	05/12/2021	81.05	41.37	10.32	20.70	0.55
3	09/12/2021	81.96	41.40	11.98	22.73	0.53
4	12/12/2021	83.81	43.40	10.26	23.81	0.60
5	16/12/2021	81.82	41.12	11.33	21.70	0.57
6	19/12/2021	84.41	44.13	12.01	24.54	0.55
7	23/12/2021	82.82	42.48	10.35	23.27	0.56
8	26/12/2021	84.11	45.26	11.27	22.60	0.55
9	30/12/2021	83.59	43.90	10.45	21.43	0.60
10	02/01/2022	85.09	44.89	10.87	22.45	0.61
11	06/01/2022	84.35	44.96	12.42	20.81	0.59
12	09/01/2022	83.67	44.20	10.49	22.15	0.57
13	13/01/2022	83.86	43.64	12.13	23.02	0.59
14	16/01/2022	85.27	45.39	11.75	24.30	0.55
15	20/01/2022	82.96	42.97	10.68	22.89	0.55
16	23/01/2022	83.20	43.95	11.96	23.32	0.59
17	27/01/2022	83.34	43.57	10.06	21.29	0.54
18	30/01/2022	85.58	45.56	12.07	20.69	0.58
19	03/02/2022	81.84	41.99	10.89	23.61	0.59
20	06/02/2022	82.86	42.73	11.53	21.53	0.60
21	10/02/2022	83.26	43.98	12.24	23.71	0.57
22	13/02/2022	85.39	45.46	10.80	21.01	0.55
23	17/02/2022	82.95	41.47	10.87	22.45	0.56
24	20/02/2022	84.41	44.13	10.61	20.64	0.59
Minimum		**81.05**	**41.12**	**10.06**	**20.64**	**0.53**
Maximum		**85.58**	**45.56**	**12.42**	**24.54**	**0.61**
Average		**83.49**	**43.52**	**11.20**	**22.34**	**0.57**
98th Percentile		**85.49**	**45.51**	**12.34**	**24.43**	**0.61**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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Recognized from MoEF & CC under E(P)A 1986
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Ph.: No.: +91-9971912476, 9350952231
E-mail: ultraresearchlab@gmail.com | Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-02032022-06 Issue Date: 02/03/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ6 Mutkallipur (End Of Alignment)
Analysis Duration 05/12/2021 To 02/03/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/09/2021	86.86	46.21	10.88	23.02	0.57
2	05/09/2021	85.39	45.03	11.35	22.30	0.56
3	09/09/2021	85.27	46.70	10.89	25.10	0.57
4	12/09/2021	88.18	47.91	11.88	22.99	0.60
5	16/09/2021	86.72	46.54	12.82	24.41	0.59
6	19/09/2021	89.79	49.60	12.26	23.19	0.61
7	23/09/2021	87.33	47.48	13.12	24.28	0.66
8	26/09/2021	88.97	48.30	10.35	22.79	0.68
9	30/09/2021	92.55	52.64	11.76	24.87	0.63
10	02/10/2021	93.57	53.84	13.23	23.17	0.70
11	06/10/2021	91.77	51.41	13.57	24.88	0.64
12	09/10/2021	92.74	52.27	11.95	25.24	0.67
13	13/10/2021	90.45	50.77	14.18	26.29	0.68
14	16/10/2021	89.83	49.39	12.35	22.54	0.60
15	20/10/2021	90.97	50.20	12.17	23.83	0.64
16	23/10/2021	88.32	48.21	13.21	24.99	0.68
17	27/10/2021	90.34	49.39	12.24	23.44	0.65
18	02/11/2021	87.57	47.38	13.51	23.31	0.68
19	06/11/2021	93.00	53.20	11.60	22.17	0.71
20	09/11/2021	95.48	55.66	14.09	25.27	0.62
21	13/11/2021	93.93	54.22	11.55	24.82	0.55
22	16/11/2021	97.14	54.53	10.41	23.29	0.71
23	20/11/2021	86.06	46.24	13.26	22.85	0.64
24	23/11/2021	95.03	53.32	14.43	25.75	0.60
Minimum		**85.27**	**45.03**	**10.35**	**22.17**	**0.55**
Maximum		**97.14**	**55.66**	**14.43**	**26.29**	**0.71**
Average		**90.30**	**50.02**	**12.38**	**23.95**	**0.64**
98th Percentile		**96.38**	**55.14**	**14.32**	**26.04**	**0.71**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-11012022-01 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	:	Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.	
Sample Drawn On	:	08/01/2022	
Sample Drawn By	:	UTRL	
Sample Description	:	Ground Water	
Sampling Location	:	GW-1 Doharia Basdeo	GW-2 Bidhanpur
Block/District	:	Khajni Block /Gorakhpur	Khajni Block /Gorakhpur
Sampling Procedure	:	IS 3025(Part-01)	
Sample Quantity	:	2.0 Litre	
Analysis Duration	:	11/01/2022 to 17/01/2022	

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-1	GW-2			
1	pH	IS:3025(Part-11)	7.58	7.16	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	348	296	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	97.44	94.72	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	25.37	14.39	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	35.22	25.44	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	0.23	0.17	mg/l	0.3	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	0.32	0.62	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	560	514	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-11012022-(Page 1 of 2)

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TC-8198

16	Sulphate (as SO_4)	IS:3025(Part-24)	15.38	15.38	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	9.35	1.93	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	340	324	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	0.05

End Of Report

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-11012022-01 **Issue Date: 17/01/2022**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 08/01/2022
Sample Drawn By : UTRL
Sample Description : Ground Water

Sampling Location	GW-1	GW-2
	: Doharia Basdeo	Bidhanpur
Block/District	: Khajni Block /Gorakhpur	Khajni Block /Gorakhpur
Analysis Duration	: 11/01/2022 to 17/01/2022	

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW-1	GW-2		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100m	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-11012022-02 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 10/01/2022
Sample Drawn By : UTRL
Sample Description : Ground Water
Sampling Location : GW-3 Mahadevpur | GW-4 Muskarai
Block/District : Atraulia Block /Azamgarh | Bhiyawan Block /Ambedkar Nagar
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 11/01/2022 to 17/01/2022

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-3	GW-4			
1	pH	IS:3025(Part-11)	7.32	7.18	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	264	344	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	84.48	110.08	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	12.83	16.72	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	21.53	19.57	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	0.14	0.14	mg/l	0.3	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	<0.1	1.12	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	453	523	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-11012022- (Page 1 of 2)

TECHNICAL MANAGER

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Website: http://www.ultralabnoida.com

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16	Sulphate (as SO_4)	IS:3025(Part-24)	13.19	15.38	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	0.26	0.79	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	288	328	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	0.05

End Of Report

Note:-

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TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-11012022-02 **Issue Date: 17/01/2022**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 10/01/2022
Sample Drawn By : UTRL
Sample Description : Ground Water

Sampling Location	GW-3	GW-4
	: Mahadevpur	Muskarai
Block/District	: Atraulia Block /Azamgarh	Bhiyawan Block /Ambedkar Nagar
Analysis Duration	: 11/01/2022 to 17/01/2022	

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW-3	GW-4		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100m	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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TC-8198

TEST REPORT

Noise Report

Report Code: N-11012022-01 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Proponent	:	M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	:	Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	:	06/01/2022 To 07/01/2022
Sample Drawn By	:	UTRL
Sample Description	:	Ambient Noise
Sampling Protocol	:	UTRL/STP/Noise
Weather Condition	:	Clear
Monitoring Duration	:	24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)	59.0	44.2	57.9	**65.0**	**55.0**	**Commercial**
2	Akona Khurd Ch-49+800	51.4	41.1	51.3	**55.0**	**45.0**	**Residential**
3	Chaudia Masan	50.6	38.1	49.9	**55.0**	**45.0**	**Residential**
*Day Time		Leq(6.00AM TO 10.00 PM)					
*Night Time		Leq(10.00PM TO 6.00 AM)					

Note:-

End Of Report

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TC-8198

TEST REPORT

Noise Report

Report Code: N-11012022-02 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P. 226016,INDIA**

Project Proponent	:	M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	:	Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	:	07/01/2022 To 08/01/2022
Sample Drawn By	:	UTRL
Sample Description	:	Ambient Noise
Sampling Protocol	:	UTRL/STP/Noise
Weather Condition	:	Clear
Monitoring Duration	:	24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Daswat Pur Ethiya	53.4	39.1	52.4	**55.0**	**45.0**	**Residential**
2	Mahadevpur	52.2	41.1	51.8	**55.0**	**45.0**	**Residential**
3	Mutkallipur (End Of Alignment)	61.5	47.2	60.5	**65.0**	**55.0**	**Commercial**

*Day Time	Leq(6.00AM TO 10.00 PM)
*Night Time	Leq(10.00PM TO 6.00 AM)

Note:-

End Of Report

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TC-8198

TEST REPORT

Soil Sample Analysis

Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-11012022-01 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 08/01/2022
Sample Drawn By : UTRL
Sample Description : Soil

Sample Location	: SQ-1 Agricultural land at Bhagwanpur Bhakra Tiwari	SQ-2 Bharsi	SQ-3 Agricultural land at AkaunaKhurd
Block/District	: Piprauli Block /Gorakhpur	Belghat Block /Gorakhpur	Belghat Block /Gorakhpur

Sample Quantity : 2.0 kg
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Units	Location			Test Method
			SQ-1	SQ-2	SQ-3	
1	Texture	-	Clay Loam	Sandy Clay	Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	36.52	47.97	44.94	UTRL/LAB/SOIL/SOP/05
	Clay	%	32.31	38.53	35.29	UTRL/LAB/SOIL/SOP/05
	Silt	%	31.17	13.50	19.77	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)	-	7.69	7.36	7.57	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	478.1	615.8	685.4	IS: 14767
4	Potassium (as K)	mg/kg	241.46	205.35	277.56	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	317.69	323.85	339.58	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4324.40	4081.77	4669.74	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	535.50	676.72	561.84	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	1.21	1.24	1.25	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	33.14	31.22	34.24	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.072	0.083	0.092	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	69.41	64.07	93.31	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.28	1.30	1.28	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.21	0.93	1.70	IS: 2720 (Part-22)
14	Porosity	%	41.47	42.53	39.33	UTRL/LAB/SOIL/SOP/17

End Of Report

Note:-

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4. The Report can not be used as evidence in a court of law without the written approval of the lab.

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For Ultra Testing & Research Laboratory

(Authorized Signatory)

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ULTRA TESTING & RESEARCH LABORATORY

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Recognized from MoEF & CC under E(P)A 1986
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TC-8198

TEST REPORT

Soil Sample Analysis

Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-11012022-02 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaltipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 10/01/2022
Sample Drawn By : UTRL
Sample Description : Soil
Sample Location : SQ-4 Katohi ; SQ-5 Shivpal
Block/District : Azamgarh ; Bhiyawan Block in Jalalpur Tehsil Ambedkar Nagar
Sample Quantity : 2.0 kg
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Units	Location		Test Method
			SQ-4	SQ-5	
1	Texture	-	Sandy Clay	Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	45.64	21.27	UTRL/LAB/SOIL/SOP/05
	Clay	%	39.51	29.68	UTRL/LAB/SOIL/SOP/05
	Silt	%	14.85	49.05	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)	-	8.06	6.95	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	341.4	298.1	IS: 14767
4	Potassium (as K)	mg/kg	124.46	220.07	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	203.80	329.11	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4323.59	4377.46	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	629.93	887.02	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	0.77	1.19	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	33.86	44.93	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.063	0.109	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	64.12	71.40	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.33	1.28	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.23	1.22	IS: 2720 (Part-22)
14	Porosity	%	41.89	40.14	UTRL/LAB/SOIL/SOP/17

End Of Report

Note:

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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For Ultra Testing & Research Laboratory

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-11012022-03 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 08/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Kuwano River at Trilokpur
Block/District	: Belghat Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.19	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.2	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	11.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	315.2	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	27	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	104	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	24.96	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	10.11	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	17.61	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.53	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.32	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	195	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-11012022-03

TECHNICAL MANAGER

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TC-8198

Contd. To report Code: WW-11012022-03

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	104.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	14.91	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.96	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	12.33	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromium (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part 49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	3.98	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.93	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-11012022-03 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 08/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Kuwano River at Trilokpur
Block/District	: Belghat Block /Gorakhpur
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	280	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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Ultra Lab

TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-11012022-04 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 10/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: GhaghraNadi at Kamhariya Ghat
Block/District	: Belghat Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.38	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.5	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	9.3	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	396.8	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	24	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	124	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.9	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	19.84	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	18.08	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	23.48	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.74	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	246	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-11012022-04

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Website: http://www.ultralabnoida.com

TC-8198

Contd. To report Code: WW-11012022-04

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	124.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	29.20	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.74	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	16.44	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	5.30	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.94	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	20.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-11012022-04 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 10/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: GhaghraNadi at Kamhariya Ghat
Block/District	: Belghat Block /Ambedkar Nagar
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	544	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

TECHNICAL MANAGER

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-11012022-05 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 10/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: ChotiSaryu at ItoriKhalispur
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.89	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.1	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	8.1	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	129.1	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	18	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	22	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	7.04	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	6.42	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	9.78	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.65	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	80	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-11012022-05

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Contd. To report Code: WW-11012022-05

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	44.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	21.04	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.21	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	6.85	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	2.28	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	0.73	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	20.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-11012022-05 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 10/01/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : ChotiSaryu at ItoriKhalispur
Block/District : Jalal Pur Block /Ambedkar Nagar
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	326	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-11012022-06 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 10/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Tons River at Chodahprass
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.97	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.2	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	10.5	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	199.3	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	22	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	47	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.9	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	10.40	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	9.48	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	11.74	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	1.29	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	124	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-11012022-06

TECHNICAL MANAGER

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Contd. To report Code: WW-11012022-06

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	65.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	27.47	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.35	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	8.22	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	2.74	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.07	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	20.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

(Authorized Signatory)

Archana
Checked By

ULTRA TESTING & RESEARCH LABORATORY

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Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-11012022-06 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 10/01/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Tons River at Chodahprass
Block/District : Jalal Pur Block /Ambedkar Nagar
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	386	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

Assuring you of best our services at all times.

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Ultra Lab

TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-11012022-07 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 08/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Majohi River
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.11	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.8	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	18.3	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	349.9	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	60	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	96	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.6	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	20.80	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	12.64	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	19.57	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.59	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.13	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	217	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-11012022-07

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Website: http://www.ultralabnoida.com

TC-8198

Contd. To report Code: WW-11012022-07

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	104.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	33.60	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	2.57	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	15.65	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS.3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	5.05	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	4.62	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-11012022-07 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 08/01/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Majohi River
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	580	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

TECHNICAL MANAGER

Assuring you of best our services at all times.

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-11012022-01 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 10/01/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Sowvan Nala
Block/District : Piprauli Block /Gorakhpur
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.52		6.5 8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.8	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	18.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	346.9	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	43	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	84	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	4.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	6.8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	25.60	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	11.66	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	29.35	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.81	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.18	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	225	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-11012022-01

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

Contd. To report Code: WW-11012022-01

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	112.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	36.55	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	2.93	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	17.61	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	0.14	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	5.87	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	5.43	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	20.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

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ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-11012022-01 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 10/01/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Sowvan Nala
Block/District : Piprauli Block /Gorakhpur
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	1684	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

(Authorized Signatory)

TECHNICAL MANAGER

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-11012022-02 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 08/01/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Aami Nadi at Dadauna
Block/District	: Khajni Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.96	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	16.5	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	19.4	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	328.7	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	28	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	84	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	4.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.4	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	16.64	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	15.16	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	21.53	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.93	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	204	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-11012022-02

TECHNICAL MANAGER

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TC-8198

Contd. To report Code: WW-11012022-02

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	104.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	35.01	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.98	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	17.22	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	5.55	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.07	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	20.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-11012022-02 **Issue Date: 17/01/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 08/01/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Aami Nadi at Dadauna
Block/District : Khajni Block /Gorakhpur
Analysis Duration : 11/01/2022 To 17/01/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	622	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

Annexure-II: Lab Report

Quarter	Month
III	March 2022 to May 2022

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31052022-01 Issue Date: 31/05/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ1 Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)
Analysis Duration 05/03/2022 To 31/05/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3) IS:5182(Part-23	Particulate Matter PM2.5 (µg /m^3) IS:5182(Part-24	Sulphur Dioxide SO_2 (µg /m^3) IS:5182(Part-2)	Nitrogen Dioxide NO_2 (µg /m^3) IS:5182(Part-6)	Carbon monoxide CO (mg /m^3) IS:5182(Part-X)
1	01/03/2022	84.72	44.07	12.69	22.65	0.66
2	05/03/2022	86.67	46.73	14.12	24.70	0.59
3	08/03/2022	87.11	47.63	12.86	22.71	0.68
4	12/03/2022	89.66	49.53	13.91	23.71	0.63
5	15/03/2022	85.15	45.13	12.76	22.91	0.60
6	19/03/2022	86.12	46.67	13.41	23.93	0.69
7	22/03/2022	84.77	44.55	10.85	20.83	0.60
8	26/03/2022	88.01	48.47	13.44	23.98	0.72
9	29/03/2022	89.49	49.24	14.23	24.52	0.68
10	02/04/2022	86.98	46.28	13.82	25.47	0.70
11	05/04/2022	87.55	47.87	13.21	23.01	0.62
12	09/04/2022	86.24	46.08	12.54	22.19	0.58
13	12/04/2022	90.62	50.20	11.65	21.04	0.69
14	16/04/2022	88.19	48.14	12.50	24.03	0.61
15	19/04/2022	90.79	50.91	13.41	23.01	0.66
16	23/04/2022	85.09	45.72	12.55	22.22	0.64
17	26/04/2022	92.90	52.13	12.33	21.89	0.61
18	30/04/2022	89.50	49.34	10.95	20.84	0.72
19	03/05/2022	84.35	44.10	12.14	22.66	0.68
20	07/05/2022	92.52	52.44	13.89	23.68	0.62
21	10/05/2022	85.64	45.59	12.50	22.18	0.59
22	14/05/2022	91.99	51.34	13.66	23.76	0.54
23	17/05/2022	87.18	47.47	14.06	23.22	0.58
24	21/05/2022	84.42	44.97	11.61	21.54	0.66
Minimum		**84.35**	**44.07**	**10.85**	**20.83**	**0.54**
Maximum		**92.90**	**52.44**	**14.23**	**25.47**	**0.72**
Average		**87.74**	**47.69**	**12.88**	**22.95**	**0.64**
98th Percentile		**92.73**	**52.30**	**14.18**	**25.12**	**0.72**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31052022-02 Issue Date: 31/05/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226046,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/04	Location : AQ 2 CH -36+800
Analysis Duration 05/03/2022 To 31/05/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	01/03/2022	87.39	45.59	10.73	19.78	0.58
2	05/03/2022	83.98	47.99	11.31	21.94	0.63
3	08/03/2022	82.56	45.58	10.51	20.34	0.66
4	12/03/2022	88.46	48.09	9.93	20.49	0.62
5	15/03/2022	86.75	45.31	12.66	22.28	0.53
6	19/03/2022	88.38	48.25	10.71	20.75	0.60
7	22/03/2022	84.59	44.66	9.93	18.82	0.56
8	26/03/2022	82.30	42.85	12.58	23.56	0.59
9	29/03/2022	84.66	44.47	11.56	22.63	0.66
10	02/04/2022	87.04	47.17	13.13	22.14	0.63
11	05/04/2022	86.13	46.55	11.20	20.95	0.60
12	09/04/2022	81.43	41.78	12.78	22.75	0.55
13	12/04/2022	87.41	47.56	12.43	23.24	0.54
14	16/04/2022	85.70	45.59	13.62	24.54	0.69
15	19/04/2022	84.46	44.61	11.86	21.42	0.56
16	23/04/2022	88.62	48.14	11.52	22.55	0.64
17	26/04/2022	82.52	42.76	11.15	22.45	0.55
18	30/04/2022	84.59	44.45	10.83	21.35	0.58
19	03/05/2022	88.37	48.86	11.77	21.93	0.61
20	07/05/2022	89.79	49.17	10.31	20.59	0.68
21	10/05/2022	84.28	44.29	12.47	23.13	0.58
22	14/05/2022	82.07	41.46	12.54	22.03	0.54
23	17/05/2022	84.97	44.83	9.88	20.56	0.60
24	21/05/2022	85.64	45.41	11.84	21.39	0.58
Minimum		**81.43**	**41.46**	**9.88**	**18.82**	**0.53**
Maximum		**89.79**	**49.17**	**13.62**	**24.54**	**0.69**
Average		**85.50**	**45.64**	**11.55**	**21.73**	**0.60**
98th Percentile		**89.25**	**49.03**	**13.40**	**24.09**	**0.69**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31052022-03 Issue Date: 31/05/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ3 Chaudia Masan
Analysis Duration 05/03/2022 To 31/05/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	01/03/2022	86.68	46.77	12.44	22.71	0.59
2	05/03/2022	82.68	42.19	10.86	20.50	0.56
3	08/03/2022	86.30	46.34	12.47	22.13	0.58
4	12/03/2022	89.03	49.27	10.84	20.63	0.63
5	15/03/2022	85.57	45.35	14.08	25.06	0.67
6	19/03/2022	86.13	46.28	14.38	24.35	0.54
7	22/03/2022	83.23	43.30	13.42	23.53	0.60
8	26/03/2022	87.15	47.62	12.75	22.13	0.68
9	29/03/2022	89.92	49.81	13.62	24.54	0.63
10	02/04/2022	84.42	44.12	12.72	22.46	0.58
11	05/04/2022	91.77	51.36	12.62	22.10	0.54
12	09/04/2022	89.13	49.28	14.24	24.35	0.63
13	12/04/2022	86.00	46.98	10.12	20.20	0.56
14	16/04/2022	84.54	44.40	11.27	20.56	0.60
15	19/04/2022	83.15	43.27	12.17	22.46	0.54
16	23/04/2022	82.27	42.42	11.87	21.75	0.58
17	26/04/2022	85.94	45.30	9.79	19.84	0.52
18	30/04/2022	81.96	41.82	11.56	21.63	0.60
19	03/05/2022	85.52	45.30	13.66	23.51	0.62
20	07/05/2022	83.68	43.98	12.24	21.67	0.66
21	10/05/2022	81.16	41.65	11.19	19.56	0.55
22	14/05/2022	87.37	47.58	11.98	21.39	0.53
23	17/05/2022	84.67	44.65	12.22	22.85	0.56
24	21/05/2022	82.80	42.67	13.63	24.19	0.61
Minimum		**81.16**	**41.65**	**9.79**	**19.56**	**0.52**
Maximum		**91.77**	**51.36**	**14.38**	**25.06**	**0.68**
Average		**85.46**	**45.49**	**12.34**	**22.25**	**0.59**
98th Percentile		**90.92**	**50.65**	**14.32**	**24.82**	**0.67**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31052022-04 Issue Date: 31/05/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ4 Daswat Pur Ethiya
Analysis Duration 05/03/2022 To 31/05/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3) IS:5182(Part-23	Particulate Matter PM2.5 (µg /m^3) IS:5182(Part-24	Sulphur Dioxide SO_2 (µg /m^3) IS:5182(Part-2)	Nitrogen Dioxide NO_2 (µg /m^3) IS:5182(Part-6)	Carbon monoxide CO (mg /m^3) IS:5182(Part-X)
1	02/03/2022	83.86	43.22	11.43	24.13	0.59
2	06/03/2022	84.47	44.17	12.30	24.19	0.55
3	09/03/2022	86.90	46.40	13.06	21.96	0.61
4	13/03/2022	86.25	46.77	10.91	22.34	0.58
5	16/03/2022	90.39	50.74	12.50	24.05	0.68
6	20/03/2022	85.76	45.48	13.41	25.37	0.55
7	23/03/2022	82.98	42.35	12.68	24.38	0.71
8	27/03/2022	88.10	48.80	12.67	22.49	0.56
9	30/03/2022	85.57	45.78	11.15	21.91	0.63
10	03/04/2022	83.59	43.31	12.70	23.49	0.60
11	06/04/2022	90.00	50.52	11.07	20.45	0.58
12	10/04/2022	87.41	47.13	12.57	24.17	0.69
13	13/04/2022	92.06	52.30	12.39	25.31	0.66
14	17/04/2022	85.08	45.35	12.67	24.36	0.71
15	20/04/2022	88.81	48.32	11.35	22.66	0.59
16	24/04/2022	90.62	50.63	12.34	24.00	0.63
17	27/04/2022	86.60	46.47	13.90	23.83	0.69
18	01/05/2022	81.86	41.58	12.00	20.67	0.59
19	04/05/2022	87.97	46.34	12.58	22.34	0.63
20	08/05/2022	86.85	45.56	11.10	22.17	0.66
21	11/05/2022	84.90	44.17	11.88	24.19	0.60
22	15/05/2022	82.00	42.73	12.66	22.47	0.56
23	18/05/2022	86.79	46.57	14.07	23.88	0.67
24	22/05/2022	80.59	40.51	12.64	22.44	0.69
Minimum		**80.59**	**40.51**	**10.91**	**20.45**	**0.55**
Maximum		**92.06**	**52.30**	**14.07**	**25.37**	**0.71**
Average		**86.23**	**46.05**	**12.33**	**23.22**	**0.62**
98th Percentile		**91.40**	**51.58**	**13.99**	**25.34**	**0.71**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31052022-05 Issue Date: 31/05/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ5 Mahadev Pur
Analysis Duration 05/03/2022 To 31/05/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/03/2022	85.94	45.72	10.90	20.57	0.54
2	06/03/2022	83.52	43.24	9.67	19.87	0.53
3	09/03/2022	86.06	46.63	13.12	23.54	0.53
4	13/03/2022	88.81	48.25	12.24	22.79	0.62
5	16/03/2022	85.94	45.10	14.14	24.37	0.58
6	20/03/2022	86.43	46.01	13.87	24.25	0.54
7	23/03/2022	82.74	42.23	12.22	22.44	0.56
8	27/03/2022	87.84	47.13	12.43	22.31	0.56
9	30/03/2022	83.46	43.64	10.35	20.22	0.58
10	03/04/2022	86.25	46.77	11.05	21.22	0.59
11	06/04/2022	90.30	50.31	10.79	20.52	0.58
12	10/04/2022	84.66	44.89	11.01	21.33	0.56
13	13/04/2022	81.43	41.36	13.48	23.12	0.58
14	17/04/2022	84.72	44.28	14.57	25.49	0.60
15	20/04/2022	87.76	47.91	13.12	22.99	0.63
16	24/04/2022	83.33	43.36	12.19	22.13	0.62
17	27/04/2022	83.89	43.42	10.17	20.12	0.56
18	01/05/2022	88.24	48.36	11.75	21.17	0.58
19	04/05/2022	82.83	42.70	9.88	19.82	0.62
20	08/05/2022	86.00	46.44	11.21	20.52	0.62
21	11/05/2022	82.27	42.42	12.43	23.24	0.55
22	15/05/2022	85.94	45.72	13.66	24.61	0.58
23	18/05/2022	84.78	44.31	12.22	23.11	0.55
24	22/05/2022	87.95	47.39	11.41	21.86	0.58
Minimum		**81.43**	**41.36**	**9.67**	**19.82**	**0.53**
Maximum		**90.30**	**50.31**	**14.57**	**25.49**	**0.63**
Average		**85.46**	**45.32**	**11.99**	**22.15**	**0.58**
98th Percentile		**89.62**	**49.42**	**14.37**	**25.09**	**0.63**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31052022-06 Issue Date: 31/05/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ6 Mutkallipur (End Of Alignment)
Analysis Duration 05/03/2022 To 31/05/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3) IS:5182(Part-23	Particulate Matter PM2.5 (µg /m^3) IS:5182(Part-24	Sulphur Dioxide SO_2 (µg /m^3) IS:5182(Part-2)	Nitrogen Dioxide NO_2 (µg /m^3) IS:5182(Part-6)	Carbon monoxide CO (mg /m^3) IS:5182(Part-X)
1	02/03/2022	84.54	44.40	12.24	22.23	0.55
2	06/03/2022	86.37	46.80	13.17	23.07	0.58
3	09/03/2022	82.46	42.73	14.20	24.47	0.56
4	13/03/2022	87.09	47.16	12.18	22.12	0.60
5	16/03/2022	85.76	45.20	13.35	23.83	0.61
6	20/03/2022	88.70	48.85	11.03	21.38	0.63
7	23/03/2022	84.91	44.36	13.35	23.83	0.62
8	27/03/2022	82.11	41.69	10.68	20.67	0.66
9	30/03/2022	91.57	51.30	14.51	25.38	0.61
10	03/04/2022	90.84	50.99	12.71	22.49	0.69
11	06/04/2022	89.56	49.85	13.35	23.83	0.63
12	10/04/2022	85.46	45.04	13.44	24.47	0.66
13	13/04/2022	89.55	49.28	12.15	22.68	0.70
14	17/04/2022	87.10	47.39	12.24	22.23	0.59
15	20/04/2022	90.73	50.74	10.79	20.90	0.63
16	24/04/2022	85.51	45.10	13.45	23.63	0.71
17	27/04/2022	83.35	43.78	11.66	21.92	0.64
18	01/05/2022	87.33	47.06	12.43	22.07	0.68
19	04/05/2022	92.29	52.86	11.89	21.84	0.72
20	08/05/2022	93.50	53.80	13.91	24.08	0.62
21	11/05/2022	85.70	45.85	14.38	25.47	0.54
22	15/05/2022	94.02	54.03	12.34	22.52	0.69
23	18/05/2022	90.73	50.74	11.07	21.27	0.63
24	22/05/2022	96.67	56.97	14.20	24.72	0.59
Minimum		**82.11**	**41.69**	**10.68**	**20.67**	**0.54**
Maximum		**96.67**	**56.97**	**14.51**	**25.47**	**0.72**
Average		**88.16**	**48.16**	**12.70**	**22.96**	**0.63**
98th Percentile		**95.45**	**55.62**	**14.45**	**25.43**	**0.72**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-15042022-02 **Issue Date: 20/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 23/04/2022
Sample Drawn By : UTRL
Sample Description : Ground Water
Sampling Location : GW-3 Mahadevpur | GW-4 Muskarai
Block/District : Atraulia Block /Azamgarh | Bhiyawan Block /Ambedkar Nagar
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 25/04/2022 to 30/04/2022

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-3	GW-4			
1	pH	IS:3025(Part-11)	7.68	7.45	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	260	372	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	83.20	119.04	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	12.64	18.08	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	15.65	31.31	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	0.094	0.10	mg/l	0.3	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	<0.1	0.97	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	445	585	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-15042022-(Page 1 of 2)

TECHNICAL MANAGER

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TC-8198

Contd. To report W-15042022- (Page 2 of 2)

16	Sulphate (as SO_4)	IS:3025(Part-24)	10.52	13.34	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	0.24	1.48	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	296	356	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	0.05

End Of Report

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-15042022-02 **Issue Date: 20/04/2022**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 23/04/2022
Sample Drawn By : UTRL
Sample Description : Ground Water

Sampling Location	GW-3	GW-4
	: Mahadevpur	Muskarai
Block/District	: Atraulia Block /Azamgarh	Bhiyawan Block /Ambedkar Nagar
Analysis Duration	: 25/04/2022 to 30/04/2022	

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW-3	GW-4		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100m	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-25042022-01 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	:	Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.	
Sample Drawn On	:	22/04/2022	
Sample Drawn By	:	UTRL	
Sample Description	:	Ground Water	
Sampling Location	:	GW-1 Doharia Basdeo	GW-2 Bidhanpur
Block/District	:	Khajni Block /Gorakhpur	Khajni Block /Gorakhpur
Sampling Procedure	:	IS 3025(Part-01)	
Sample Quantity	:	2.0 Litre	
Analysis Duration	:	25/04/2022 to 30/04/2022	

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-1	GW-2			
1	pH	IS:3025(Part-11)	7.65	7.34	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	324	288	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	90.72	92.16	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	23.62	14.00	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	27.40	19.57	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	0.11	0.11	mg/l	0.3	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	0.23	0.54	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	530	509	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-25042022-01(Page 1 of 2)

TECHNICAL MANAGER

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16	Sulphate (as SO_4)	IS:3025(Part-24)	20.72	14.44	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	7.49	2.32	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	328	332	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	0.05

End Of Report

Note:-

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TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-25042022-01 **Issue Date: 30/04/2022**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 22/04/2022
Sample Drawn By : UTRL
Sample Description : Ground Water

Sampling Location	GW-1	GW-2
	: Doharia Basdeo	Bidhanpur
Block/District	: Khajni Block /Gorakhpur	Khajni Block /Gorakhpur
Analysis Duration	: 25/04/2022 to 30/04/2022	

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW 1	GW 2		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100m	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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TEST REPORT

Noise Report

Report Code: N-11042022-01 **Issue Date: 16/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Proponent	:	M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	:	Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	:	06/04/2022 To 07/04/2022
Sample Drawn By	:	UTRL
Sample Description	:	Ambient Noise
Sampling Protocol	:	UTRL/STP/Noise
Weather Condition	:	Clear
Monitoring Duration	:	24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)	60.2	44.6	59.0	**65.0**	**55.0**	**Commercial**
2	Akona Khurd Ch-49+800	51.8	41.0	51.6	**55.0**	**45.0**	**Residential**
3	Chaudia Masan	50.3	37.9	49.7	**55.0**	**45.0**	**Residential**
*Day Time		Leq(6.00AM TO 10.00 PM)					
*Night Time		Leq(10.00PM TO 6.00 AM)					

Note:-

End Of Report

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TEST REPORT

Noise Report

Report Code: N-11042022-02 **Issue Date: 16/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Proponent	: M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	: Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	: 07/04/2022 To 08/04/2022
Sample Drawn By	: UTRL
Sample Description	: Ambient Noise
Sampling Protocol	: UTRL/STP/Noise
Weather Condition	: Clear
Monitoring Duration	: 24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Daswat Pur Ethiya	53.0	39.2	52.1	**55.0**	**45.0**	**Residential**
2	Mahadevpur	52.8	41.6	52.4	**55.0**	**45.0**	**Residential**
3	Mutkallipur (End Of Alignment)	62.6	46.9	61.4	**65.0**	**55.0**	**Commercial**
*Day Time		Leq(6.00AM TO 10.00 PM)					
*Night Time		Leq(10.00PM TO 6.00 AM)					

Note:-

End Of Report

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TEST REPORT

Soil Sample Analysis
Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-25042022-01 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 22/04/2022
Sample Drawn By : UTRL
Sample Description : Soil

Sample Location	: SQ-1 Agricultural land at Bhagwanpur Bhakra Tiwari	SQ-2 Bharsi	SQ-3 Agricultural land at AkaunaKhurd
Block/District	: Piprauli Block /Gorakhpur	Belghat Block /Gorakhpur	Belghat Block /Gorakhpur

Sample Quantity : 2.0 kg
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Units	Location			Test Method
			SQ-1	SQ-2	SQ-3	
1	Texture	-	Clay Loam	Sandy Clay	Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	36.33	49.93	44.05	UTRL/LAB/SOIL/SOP/05
	Clay	%	32.18	37.08	31.05	UTRL/LAB/SOIL/SOP/05
	Silt	%	31.49	12.99	24.90	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)	-	7.74	7.5	7.85	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	458.9	587.4	624.9	IS: 14767
4	Potassium (as K)	mg/kg	238.67	233.50	256.10	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	385.35	312.03	301.13	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4408.23	4143.36	4486.77	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	657.76	716.34	629.43	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	1.43	1.18	1.11	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	31.04	30.96	35.32	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.084	0.078	0.082	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	75.67	69.10	77.37	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.29	1.30	1.28	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.17	0.96	1.46	IS: 2720 (Part-22)
14	Porosity	%	42.04	42.18	40.15	UTRL/LAB/SOIL/SOP/17

End Of Report

Note:

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For Ultra Testing & Research Laboratory

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TEST REPORT

Soil Sample Analysis

Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-25042022-02 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 23/04/2022
Sample Drawn By : UTRL
Sample Description : Soil
Sample Location : SQ-4 Katohi ; SQ-5 Shivpal
Block/District : Azamgarh ; Bhiyawan Block in Jalalpur Tehsil Ambedkar Nagar
Sample Quantity : 2.0 kg
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Units	Location		Test Method
			SQ-4	SQ-5	
1	Texture	-	Sandy Clay	Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	44.80	20.49	UTRL/LAB/SOIL/SOP/05
	Clay	%	39.20	30.55	UTRL/LAB/SOIL/SOP/05
	Silt	%	16.00	48.96	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)		7.96	7.04	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	412.3	312.4	IS: 14767
4	Potassium (as K)	mg/kg	135.37	241.87	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	216.51	352.40	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4550.71	4603.14	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	739.29	861.00	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	0.78	1.25	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	31.55	43.45	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.081	0.094	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	69.73	76.61	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.32	1.28	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.18	1.22	IS: 2720 (Part-22)
14	Porosity	%	42.16	40.41	UTRL/LAB/SOIL/SOP/17

End Of Report

Note:-

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TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-25042022-04 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 23/04/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : GhaghraNadi at Kamhariya Ghat
Block/District : Belghat Block /Ambedkar Nagar
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.64	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	26.6	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	11.2	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	345.3	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	32	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	112	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.4	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	17.92	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	16.33	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	15.65	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.91	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	214	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-25042022-04

TECHNICAL MANAGER

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Contd. To report Code: WW-25042022-04

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	112.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	28.26	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.83	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	10.96	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromium (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	3.53	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.55	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	17.60	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

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Ph.: No.: +91-9971912476, 9350952231
E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-25042022-04 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 23/04/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: GhaghraNadi at Kamhariya Ghat
Block/District	: Belghat Block /Ambedkar Nagar
Analysis Duration	: 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	480	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-25042022-05 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 23/04/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: ChotiSaryu at ItoriKhalispur
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.96	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	27.4	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	10.9	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	170.8	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	23	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	32	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	8.1	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	7.84	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	7.14	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	13.70	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.51	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	106	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-25042022-05

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Contd. To report Code: WW-25042022-05

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	49.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	27.32	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.72	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	9.59	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromium (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	3.20	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.06	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

(Authorized Signatory)

Archana
Checked By

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-25042022-05 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 23/04/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : ChotiSaryu at ItoriKhalispur
Block/District : Jalal Pur Block /Ambedkar Nagar
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	216	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-25042022-06 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 23/04/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Tons River at Chodahprass
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.48	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	26.9	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	13.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	410.9	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	27	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	148	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	8.1	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	22.40	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	20.41	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	13.70	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.91	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	255	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-25042022-06

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Website: http://www.ultralabnoida.com

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15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	140.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	26.69	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.07	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	9.59	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	3.20	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.12	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	9.60	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-25042022-06 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 23/04/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Tons River at Chodahprass
Block/District : Jalal Pur Block /Ambedkar Nagar
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	416	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

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Assuring you of best our services at all times.

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-25042022-07 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 22/04/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Majhoi Nadi (Begikol)
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	6.98	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	26.4	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	13.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	422.2	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	52	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	124	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	4.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.4	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	24.80	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	15.07	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	25.44	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.80	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.17	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	262	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-25042022-07

ULTRA TESTING & RESEARCH LABORATORY TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

Contd. To report Code: WW-25042022-07

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	124.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	30.93	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	3.30	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	20.35	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	6.56	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	3.52	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	19.20	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
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Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

(Authorized Signatory)

Checked By

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-25042022-07 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 22/04/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Majhoi Nadi (Begikol)
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	476	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

TECHNICAL MANAGER

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-25042022-01 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 23/04/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Sowvan Nala
Block/District : Piprauli Block /Gorakhpur
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS.3025(Part-11)	7.46	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	27.3	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	21.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	371.6	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	47	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	76	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	5.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	6.2	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	30.40	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	9.72	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	33.27	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.93	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.18	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	242	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-25042022-01

TECHNICAL MANAGER

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Contd. To report Code: WW-25042022-01

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	116.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	45.09	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	3.05	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	23.29	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	0.18	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	7.76	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	6.53	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	28.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

(Authorized Signatory)

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E-mail: ultraresearchlab@gmail.com
Website: http://www.ultralabnoida.com

TEST REPORT

Surface Water Sample Analysis

Report Code: WW-25042022-01 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 23/04/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Sowvan Nala
Block/District	: Piprauli Block /Gorakhpur
Analysis Duration	: 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	2110	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-25042022-02 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 22/04/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Aami Nadi at Dadauna
Block/District	: Khajni Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.32	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	27.3	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	17.2	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	419.2	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	24	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	120	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	19.84	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	18.08	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	31.31	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.74	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	260	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-25042022-02

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Website: http://www.ultralabnoida.com

TC-8198

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	124.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	24.80	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.07	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	25.05	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	8.08	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	3.41	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	17.60	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-25042022-02 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 22/04/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Aami Nadi at Dadauna
Block/District	: Khajni Block /Gorakhpur
Analysis Duration	: 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	542	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
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For ULTRA TESTING & RESEARCH LABORATORY

Archana
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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-25042022-03 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 22/04/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Kuwano River at Trilokpur
Block/District	: Belghat Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS.3025(Part-11)	7.43	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	26.9	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	9.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	373.9	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	21	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	124	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	29.76	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	12.05	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	17.61	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.51	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.23	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	232	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-25042022-03

TECHNICAL MANAGER

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TC-8198

Contd. To report Code: WW-25042022-03

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	124.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	22.29	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.46	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	12.33	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	3.98	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.67	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

Ultra Lab

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-25042022-03 **Issue Date: 30/04/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 22/04/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Kuwano River at Trilokpur
Block/District : Belghat Block /Gorakhpur
Analysis Duration : 25/04/2022 To 30/04/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	312	MPN/100ml	50	500	5000	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

(Authorized Signatory)

Annexure-II: Lab Report

Quarter	Month
IV	June 2022 to August 2022

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 (EMS) Certified)
Recognized from MoEF & CC under E(P)A 1986
Laboratory: C-43, Sector-88, Phase-II, Noida, U.P.
Ph.: No.: +91 9971912476, 9350952231
E-mail: ultraresearchlab@gmail.com | Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31082022-01 Issue Date: 31/08/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ1 Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)
Analysis Duration 05/06/2022 To 31/08/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3) IS:5182(Part-23	Particulate Matter PM2.5 (µg /m^3) IS:5182(Part-24	Sulphur Dioxide SO_2 (µg /m^3) IS:5182(Part-2)	Nitrogen Dioxide NO_2 (µg /m^3) IS:5182(Part-6)	Carbon monoxide CO (mg /m^3) IS:5182(Part-X)
1	01/06/2022	90.09	50.38	13.22	23.71	0.63
2	05/06/2022	88.49	48.50	12.75	22.89	0.61
3	08/06/2022	87.61	47.90	11.53	21.91	0.66
4	12/06/2022	86.91	46.21	13.54	23.36	0.62
5	15/06/2022	85.40	45.66	14.05	24.21	0.59
6	19/06/2022	87.64	47.22	13.73	24.18	0.67
7	22/06/2022	84.08	44.00	9.51	19.28	0.58
8	26/06/2022	91.24	51.16	12.37	22.38	0.63
9	29/06/2022	90.56	50.17	13.85	23.43	0.67
10	02/07/2022	86.67	46.54	11.27	21.67	0.69
11	05/07/2022	84.71	44.52	12.68	22.50	0.61
12	09/07/2022	86.67	46.73	13.57	23.04	0.55
13	12/07/2022	91.64	51.76	8.85	18.59	0.61
14	16/07/2022	86.30	46.11	13.37	23.31	0.59
15	19/07/2022	88.29	48.16	11.70	21.99	0.64
16	23/07/2022	85.51	45.52	10.26	20.49	0.58
17	26/07/2022	87.45	47.74	9.77	19.25	0.54
18	30/07/2022	86.07	46.08	11.19	21.12	0.67
19	03/08/2022	85.45	45.49	12.33	22.87	0.62
20	07/08/2022	84.67	44.45	14.21	24.06	0.60
21	10/08/2022	85.03	44.84	12.54	22.94	0.56
22	14/08/2022	89.22	49.71	11.35	21.75	0.52
23	17/08/2022	83.48	43.46	12.34	22.40	0.59
24	21/08/2022	86.79	46.37	11.78	21.78	0.62
Minimum		**83.48**	**43.46**	**8.85**	**18.59**	**0.52**
Maximum		**91.64**	**51.76**	**14.21**	**24.21**	**0.69**
Average		**87.08**	**47.03**	**12.16**	**22.21**	**0.61**
98th Percentile		**91.45**	**51.48**	**14.14**	**24.20**	**0.68**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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For Ultra Testing & Research Laboratory

(Authorized Signatory)

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E-mail: ultraresearchlab@gmail.com | Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31082022-02 Issue Date: 31/08/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226046,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/04	Location : AQ 2 CH -36+800
Analysis Duration 05/06/2022 To 31/08/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3) IS:5182(Part-23	Particulate Matter PM2.5 (µg /m^3) IS:5182(Part-24	Sulphur Dioxide SO_2 (µg /m^3) IS:5182(Part-2)	Nitrogen Dioxide NO_2 (µg /m^3) IS:5182(Part-6)	Carbon monoxide CO (mg /m^3) IS:5182(Part-X)
1	01/06/2022	90.30	50.87	9.67	18.39	0.59
2	05/06/2022	89.23	49.53	10.43	20.75	0.62
3	08/06/2022	85.21	45.61	9.82	19.60	0.63
4	12/06/2022	92.79	52.22	10.55	23.22	0.61
5	15/06/2022	88.22	48.63	13.18	22.03	0.58
6	19/06/2022	91.40	51.49	12.86	22.71	0.59
7	22/06/2022	86.98	46.70	10.89	19.52	0.55
8	26/06/2022	85.51	45.52	12.48	22.89	0.58
9	29/06/2022	89.90	49.85	11.11	22.18	0.64
10	02/07/2022	88.54	48.80	10.41	20.42	0.62
11	05/07/2022	83.35	43.62	12.53	22.67	0.58
12	09/07/2022	84.67	44.45	12.42	22.04	0.56
13	12/07/2022	88.02	48.28	14.20	24.84	0.53
14	16/07/2022	90.57	50.55	13.45	23.76	0.63
15	19/07/2022	86.50	46.51	10.48	20.75	0.62
16	23/07/2022	85.70	45.85	11.17	21.19	0.67
17	26/07/2022	83.34	43.57	13.37	23.49	0.51
18	30/07/2022	83.19	43.31	9.92	19.35	0.59
19	03/08/2022	87.95	47.82	12.24	22.41	0.58
20	07/08/2022	86.61	46.70	8.85	18.60	0.62
21	10/08/2022	86.55	46.70	13.82	23.61	0.60
22	14/08/2022	87.38	47.47	11.23	21.51	0.56
23	17/08/2022	85.88	45.46	10.70	20.09	0.63
24	21/08/2022	86.26	46.61	10.65	20.79	0.61
Minimum		**83.19**	**43.31**	**8.85**	**18.39**	**0.51**
Maximum		**92.79**	**52.22**	**14.20**	**24.84**	**0.67**
Average		**87.25**	**47.34**	**11.52**	**21.53**	**0.60**
98th Percentile		**92.15**	**51.88**	**14.03**	**24.34**	**0.66**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31082022-03 Issue Date: 31/08/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ3 Chaudia Masan
Analysis Duration 05/06/2022 To 31/08/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	01/06/2022	90.20	50.49	11.53	21.53	0.56
2	05/06/2022	86.48	46.63	10.36	20.23	0.55
3	08/06/2022	89.13	49.70	10.89	20.45	0.59
4	12/06/2022	91.46	51.15	13.70	23.32	0.62
5	15/06/2022	86.91	46.87	12.36	22.18	0.66
6	19/06/2022	88.92	48.08	13.86	23.63	0.56
7	22/06/2022	84.49	44.36	11.70	21.99	0.63
8	26/06/2022	90.72	50.03	12.85	22.44	0.66
9	29/06/2022	92.29	52.49	10.62	20.94	0.61
10	02/07/2022	86.86	46.64	12.55	22.28	0.59
11	05/07/2022	86.12	46.86	9.90	19.60	0.55
12	09/07/2022	85.03	45.49	13.16	23.43	0.62
13	12/07/2022	84.96	44.63	8.95	18.80	0.67
14	16/07/2022	82.84	42.48	12.60	22.49	0.61
15	19/07/2022	85.51	45.52	11.65	21.60	0.52
16	23/07/2022	84.43	44.75	9.90	19.78	0.60
17	26/07/2022	88.92	48.50	8.87	18.64	0.54
18	30/07/2022	84.25	44.87	10.76	20.94	0.67
19	03/08/2022	86.79	46.80	12.75	22.52	0.63
20	07/08/2022	87.41	47.99	11.31	21.94	0.64
21	10/08/2022	83.01	43.64	8.92	18.75	0.56
22	14/08/2022	85.20	45.21	10.62	20.93	0.54
23	17/08/2022	88.67	48.36	14.52	24.30	0.59
24	21/08/2022	83.83	43.81	12.22	22.30	0.66
Minimum		**82.84**	**42.48**	**8.87**	**18.64**	**0.52**
Maximum		**92.29**	**52.49**	**14.52**	**24.30**	**0.67**
Average		**86.85**	**46.89**	**11.52**	**21.46**	**0.60**
98th Percentile		**91.91**	**51.87**	**14.22**	**23.99**	**0.67**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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E-mail: ultraresearchlab@gmail.com | Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31082022-04 Issue Date: 31/08/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ4 Daswat Pur Ethiya
Analysis Duration 05/06/2022 To 31/08/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/06/2022	86.43	46.44	12.19	22.76	0.55
2	06/06/2022	92.79	52.65	13.36	23.22	0.52
3	09/06/2022	89.52	49.21	10.37	20.43	0.67
4	13/06/2022	87.94	47.58	13.15	23.04	0.62
5	16/06/2022	86.24	46.73	11.63	21.57	0.66
6	20/06/2022	90.42	50.42	13.32	23.58	0.58
7	23/06/2022	85.27	45.85	14.10	24.35	0.68
8	27/06/2022	89.08	49.06	12.34	22.03	0.55
9	30/06/2022	86.67	46.31	9.97	19.91	0.61
10	03/07/2022	84.28	44.29	13.73	23.88	0.58
11	06/07/2022	89.77	49.35	10.68	20.30	0.55
12	10/07/2022	84.60	44.86	14.20	24.28	0.64
13	13/07/2022	90.42	50.42	11.90	21.69	0.61
14	17/07/2022	83.22	43.78	12.85	22.75	0.69
15	20/07/2022	88.97	48.37	13.37	23.42	0.56
16	24/07/2022	87.82	47.09	12.17	22.27	0.60
17	27/07/2022	85.94	45.95	10.81	20.30	0.67
18	31/07/2022	83.46	43.47	9.92	19.61	0.54
19	04/08/2022	89.08	49.49	11.50	21.47	0.60
20	08/08/2022	86.55	46.70	13.26	23.24	0.62
21	11/08/2022	85.88	45.52	10.77	20.87	0.59
22	15/08/2022	83.48	43.46	8.97	18.67	0.55
23	18/08/2022	88.49	48.50	9.98	19.38	0.64
24	22/08/2022	84.04	44.17	13.13	23.07	0.68
Minimum		**83.22**	**43.46**	**8.97**	**18.67**	**0.52**
Maximum		**92.79**	**52.65**	**14.20**	**24.35**	**0.69**
Average		**87.10**	**47.07**	**11.99**	**21.92**	**0.61**
98th Percentile		**91.70**	**51.63**	**14.16**	**24.32**	**0.68**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31082022-05 Issue Date: 31/08/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326 AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ5 Mahadev Pur
Analysis Duration 05/06/2022 To 31/08/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/06/2022	85.82	45.46	9.83	19.91	0.58
2	06/06/2022	84.24	44.67	8.60	18.83	0.55
3	09/06/2022	88.67	48.36	13.41	23.38	0.56
4	13/06/2022	86.13	46.28	10.89	20.82	0.60
5	16/06/2022	83.15	43.27	13.82	23.93	0.59
6	20/06/2022	90.20	50.49	11.95	21.91	0.55
7	23/06/2022	85.51	45.52	11.78	21.60	0.58
8	27/06/2022	89.73	49.14	10.44	20.39	0.56
9	30/06/2022	83.62	43.52	9.73	19.44	0.60
10	03/07/2022	89.21	49.56	10.53	20.57	0.62
11	06/07/2022	87.06	47.21	9.88	19.54	0.66
12	10/07/2022	85.70	45.42	11.31	21.94	0.54
13	13/07/2022	84.53	44.20	12.86	22.34	0.61
14	17/07/2022	81.45	41.58	13.96	24.11	0.64
15	20/07/2022	89.20	49.04	9.92	19.26	0.60
16	24/07/2022	84.96	44.63	11.89	21.97	0.58
17	27/07/2022	88.29	48.16	11.70	21.08	0.53
18	31/07/2022	90.62	50.63	11.65	21.60	0.60
19	04/08/2022	85.64	45.39	8.79	18.58	0.56
20	08/08/2022	87.61	47.47	8.58	18.72	0.61
21	11/08/2022	85.03	45.27	13.10	23.68	0.53
22	15/08/2022	87.52	47.16	14.12	24.33	0.62
23	18/08/2022	83.34	43.57	12.27	22.03	0.58
24	22/08/2022	90.30	50.45	10.64	20.60	0.63
Minimum		**81.45**	**41.58**	**8.58**	**18.58**	**0.53**
Maximum		**90.62**	**50.63**	**14.12**	**24.33**	**0.66**
Average		**86.56**	**46.52**	**11.32**	**21.27**	**0.59**
98th Percentile		**90.47**	**50.57**	**14.05**	**24.23**	**0.65**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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E-mail: ultrarescarchlab@gmail.com | Website: http://www.ultralabnoida.com

TC-8198

TEST REPORT

Ambient Air Quality Analysis

Report Code: AAQ-31082022-06 Issue Date: 31/08/2022

ISSUED TO : GLOBUS ENVIRONMENT ENGINEERING SERVICES
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.

Sampling Protocol : UTRL/STP/AIR/01	Location : AQ6 Mutkallipur (End Of Alignment)
Analysis Duration 05/06/2022 To 31/08/2022	Sample Drawn By : UTRL

TEST RESULT

S.No	Date	Particulate Matter PM10 (µg /m^3)	Particulate Matter PM2.5 (µg /m^3)	Sulphur Dioxide SO_2 (µg /m^3)	Nitrogen Dioxide NO_2 (µg /m^3)	Carbon monoxide CO (mg /m^3)
		IS:5182(Part-23	IS:5182(Part-24	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-X)
1	02/06/2022	87.09	47.16	10.38	20.64	0.58
2	06/06/2022	83.59	43.90	13.34	23.81	0.60
3	09/06/2022	84.96	44.20	9.93	19.55	0.55
4	13/06/2022	88.90	48.68	12.55	22.78	0.58
5	16/06/2022	86.37	46.37	14.14	24.18	0.59
6	20/06/2022	91.24	51.59	10.42	20.53	0.62
7	23/06/2022	86.25	46.97	12.66	22.41	0.66
8	27/06/2022	85.94	45.08	9.75	19.74	0.63
9	30/06/2022	90.62	50.63	14.14	24.18	0.60
10	03/07/2022	89.44	49.45	8.69	18.66	0.67
11	06/07/2022	85.94	45.92	12.63	22.66	0.61
12	10/07/2022	87.45	47.74	14.18	24.01	0.64
13	13/07/2022	86.98	46.47	11.39	21.64	0.69
14	17/07/2022	85.27	45.42	12.43	22.68	0.56
15	20/07/2022	87.47	47.17	11.32	21.95	0.62
16	24/07/2022	83.15	43.70	12.44	22.09	0.69
17	27/07/2022	85.34	45.20	10.74	20.53	0.67
18	31/07/2022	88.92	48.50	13.17	23.07	0.59
19	04/08/2022	89.50	49.39	9.90	19.23	0.69
20	08/08/2022	86.55	46.28	13.68	23.05	0.63
21	11/08/2022	83.87	43.43	11.52	21.61	0.56
22	15/08/2022	87.61	47.47	12.80	22.47	0.70
23	18/08/2022	88.36	48.51	10.44	20.67	0.62
24	22/08/2022	86.93	46.91	14.02	24.27	0.55
Minimum		**83.15**	**43.43**	**8.69**	**18.66**	**0.55**
Maximum		**91.24**	**51.59**	**14.18**	**24.27**	**0.70**
Average		**86.99**	**46.92**	**11.94**	**21.93**	**0.62**
98th Percentile		**90.95**	**51.15**	**14.16**	**24.23**	**0.70**
NAAQS,For 24 Hourly Monitoring		**100.0**	**60.0**	**80.0**	**80.0**	**4.0**

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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-16072022-01 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Ground Water
Sampling Location : GW-1 Doharia Basdeo ; GW-2 Bidhanpur
Block/District : Khajni Block /Gorakhpur ; Khajni Block /Gorakhpur
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 16/07/2022 to 21/07/2022

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-1	GW-2			
1	pH	IS:3025(Part-11)	7.47	7.28	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	320	340	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	89.60	108.80	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	23.33	16.52	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	24.46	53.81	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	0.093	<0.05	mg/l	1	No Relaxation
11	Fluoride(as F)	IS:3025(Part-60)	0.23	0.46	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	533	648	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-16072022- (Page 1 of 2)

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TC-8198

16	Sulphate (as SO_4)	IS:3025(Part-24)	19.34	31.21	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	6.41	1.93	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	340	360	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	No Relaxation

End Of Report

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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Website: http://www.ultralabnoida.com

TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-16072022-01 **Issue Date: 21/07/2022**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Ground Water

Sampling Location	GW-1	GW-2
	: Doharia Basdeo	Bidhanpur
Block/District	: Khajni Block /Gorakhpur	Khajni Block /Gorakhpur
Analysis Duration	: 16/07/2022 to 21/07/2022	

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW-1	GW-2		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100m	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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TC-8198

TEST REPORT

Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: W-16072022-02 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 14/07/2022
Sample Drawn By : UTRL
Sample Description : Ground Water
Sampling Location : GW-3 Mahadevpur | GW-4 Muskarai
Block/District : Atraulia Block /Azamgarh | Bhiyawan Block /Ambedkar Nagar
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 16/07/2022 to 21/07/2022

RESULTS
as per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Acceptable Limit	Permissible Limit in the Absence of Alternate Source
			Location				
			GW-3	GW-4			
1	pH	IS:3025(Part-11)	7.52	7.24	-	6.5-8.5	-
2	Colour	IS:3025(Part-04)	<5.0	<5.0	Hazen	5	15
3	Odour	IS-3025(Part-05)	Agreeable	Agreeable	-	Agreeable	Agreeable
4	Taste	IS:3025(Part-07)	Agreeable	Agreeable	-	Agreeable	Agreeable
5	Turbidity	IS-3025(Part-10)	<0.5	<0.5	NTU	1	5
6	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	240	380	mg/l	200	600
7	Calcium(as Ca)	IS:3025(Part-40)	76.80	121.60	mg/l	75	200
8	Magnesium(as Mg)	IS:3025(Part-46)	11.66	18.47	mg/l	30	100
9	Chloride(as Cl)	IS:3025(Part-32)	15.65	92.95	mg/l	250	1000
10	Iron(as Fe)	IS:3025(Part-53)	<0.05	0.11	mg/l	1	No Relaxation
11	Fluoride(as F)	IS.3025(Part-60)	<0.1	0.82	mg/l	1	1.5
12	Free Residual chlorine	IS:3025(Part-26)	<0.1	<0.1	mg/l	0.2	1
13	Total Dissolved Solid	IS:3025(Part-16)	413	815	mg/l	500	2000
14	Phenolic Compound (as C_6H_5OH)	IS: 3025 (Part-43)	<0.001	<0.001	mg/l	0.001max	0.002 Max
15	Anionic Detergents (as MBAS)	Annex K of IS 13428	<0.1	<0.1	mg/l	0.2	1.0

Contd. To report W-16072022- (Page 1 of 2)

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TC-8198

16	Sulphate (as SO_4)	IS:3025(Part-24)	9.82	8.94	mg/l	200	400
17	Nitrate (as NO_3)	IS: 3025 (Part-34)	1.07	1.16	mg/l	45	No Relaxation
18	Alkalinity(as CaCO3)	IS:3025(Part-23)	272	460	mg/l	200	600
19	Chloramines (as Cl_2)	IS:3025(Part-26)	< 1.0	< 1.0	mg/l	4	No Relaxation
20	Cadmium (as Cd)	IS-3025(Part-41)	<0.001	<0.001	mg/l	0.003	No Relaxation
21	Lead (as Pb)	IS:3025(Part-47)	<0.01	<0.01	mg/l	0.01	No Relaxation
22	Total Chromium (as Cr)	IS:3025(Part-52)	<0.01	<0.01	mg/l	0.05	No Relaxation
23	Copper (as Cu)	IS:3025(Part-42)	<0.01	<0.01	mg/l	0.05	1.5
24	Total Ammonia	IS: 3025 (Part-34)	<0.5	<0.5	mg/l	0.5	No Relaxation
25	Sulphide (as H2S)	IS:3025(Part-29)	<0.05	<0.05	mg/l	0.05	No Relaxation
26	Zinc (as Zn)	IS:3025(Part-49)	<0.1	<0.1	mg/l	5	15
27	Manganese (as Mn)	IS:3025(Part-59)	<0.1	<0.1	mg/l	0.1	0.3
28	Boron (as B)	IS:3025(Part-57)	<0.1	<0.1	mg/l	0.5	1
29	Selenium (Se)	IS:3025(Part-56)	<0.01	<0.01	mg/l	0.01	No Relaxation
30	Arsenic (as As)	IS:3025(Part-37)	<0.01	<0.01	mg/l	0.01	No Relaxation

End Of Report

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

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Website: http://www.ultralabnoida.com

TEST REPORT

Bacteriological Quality of Drinking Water

Report Code : W-16072022-02 **Issue Date: 21/07/2022**

Issued To : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 14/07/2022
Sample Drawn By : UTRL
Sample Description : Ground Water

Sampling Location	GW-3	GW-4
	: Mahadevpur	Muskarai
Block/District	: Atraulia Block /Azamgarh	Bhiyawan Block /Ambedkar Nagar
Analysis Duration	: 16/07/2022 to 21/07/2022	

RESULTS
As per IS 10500:2012

S.No	Parameter	Test Method	Results		Units	Requirements
			GW-3	GW-4		
1	E.coli	IS-1622	Not Detected (<2)	Not Detected (<2)	E.Coli/100m	Shall not be detectable in100 ml sample
2	Total Coliform	IS-1622	Absent	Absent	MPN/100ml	Shall not be detectable in100 ml sample

End Of Report

Note:-

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TC-8198

TEST REPORT

Noise Report

Report Code: N-12072022-01 **Issue Date: 18/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Proponent	:	M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	:	Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	:	07/07/2022 To 08/07/2022
Sample Drawn By	:	UTRL
Sample Description	:	Ambient Noise
Sampling Protocol	:	UTRL/STP/Noise
Weather Condition	:	Clear
Monitoring Duration	:	24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Chapiya Fish Farming Office at Narkatha (Start Of Alignmet -NH)	59.7	45.3	58.7	**65.0**	**55.0**	**Commercial**
2	Akona Khurd Ch-49+800	52.0	40.8	51.6	**55.0**	**45.0**	**Residential**
3	Chaudia Masan	51.0	38.3	50.3	**55.0**	**45.0**	**Residential**

*Day Time	Leq(6.00AM TO 10.00 PM)
*Night Time	Leq(10.00PM TO 6.00 AM)

Note:-

End Of Report

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TC-8198

TEST REPORT

Noise Report

Report Code: N-12072022-02 **Issue Date: 18/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Proponent	:	M/s. Uttar Pradesh Expressway Industrial Development Authority (UPEIDA)
Project Name	:	Development of Gorakhpur Link Expressway km 0+00 and km 60+000 respectively) and SH 72 and SH5 at Poorvanchal Expressway at chainage 190.600.
Monitoring Date	:	08/07/2022 To 09/07/2022
Sample Drawn By	:	UTRL
Sample Description	:	Ambient Noise
Sampling Protocol	:	UTRL/STP/Noise
Weather Condition	:	Clear
Monitoring Duration	:	24 hrs

TEST RESULT

S.No	Location	Observed Value Leq dB(A)			Limit as per CPCB Guidelines Leq. dB(A)		Zone
		Day*	Night*	Day/Night	Day*	Night*	
1	Daswat Pur Ethiya	51.9	40.0	51.4	**55.0**	**45.0**	**Residential**
2	Mahadevpur	51.8	39.9	51.2	**55.0**	**45.0**	**Residential**
3	Mutkallipur (End Of Alignment)	61.6	45.8	60.3	**65.0**	**55.0**	**Commercial**

*Day Time	Leq(6.00AM TO 10.00 PM)
*Night Time	Leq(10.00PM TO 6.00 AM)

Note:- **End Of Report**

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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TC-8198

TEST REPORT

Soil Sample Analysis

Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-16072022-01 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Soil

Sample Location	: SQ-1 Agricultural land at Bhagwanpur Bhakra Tiwari	SQ-2 Bharsi	SQ-3 Agricultural land at AkaunaKhurd
Block/District	: Piprauli Block /Gorakhpur	Belghat Block /Gorakhpur	Belghat Block /Gorakhpur

Sample Quantity : 2.0 kg
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Units	Location			Test Method
			SQ-1	SQ-2	SQ-3	
1	Texture	-	Clay Loam	Sandy Clay	Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	34.35	45.41	46.12	UTRL/LAB/SOIL/SOP/05
	Clay	%	33.63	36.49	25.99	UTRL/LAB/SOIL/SOP/05
	Silt	%	32.02	18.10	27.89	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)	-	7.88	7.67	7.81	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	612.5	610.7	612.3	IS: 14767
4	Potassium (as K)	mg/kg	251.24	243.61	256.06	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	373.72	338.20	321.42	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4811.76	4322.77	4713.08	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	613.32	747.36	620.77	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	1.35	1.25	1.17	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	30.49	29.91	33.54	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.089	0.106	0.119	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	82.00	71.30	76.22	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.31	1.30	1.30	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.29	1.20	1.52	IS: 2720 (Part-22)
14	Porosity	%	42.11	42.09	40.45	UTRL/LAB/SOIL/SOP/17

End Of Report

Note:-

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2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

Checked By

For Ultra Testing & Research Laboratory

Assuring you of best our services at all times

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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Ultra Lab

TC-8198

TEST REPORT

Soil Sample Analysis

Discipline/Group-Chemical/ Pollution & Environment

Report Code: SS-16072022-02 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 14/07/2022
Sample Drawn By : UTRL
Sample Description : Soil
Sample Location : SQ-4 Katohi | SQ-5 Shivpal
Block/District : Azamgarh | Bhiyawan Block in Jalalpur Tehsil Ambedkar Nagar
Sample Quantity : 2.0 kg
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Units	Location		Test Method
			SQ-4	SQ-5	
1	Texture	-	Sandy Clay Loam	Clay Loam	UTRL/LAB/SOIL/SOP/05
	Sand	%	47.14	43.40	UTRL/LAB/SOIL/SOP/05
	Clay	%	33.39	29.71	UTRL/LAB/SOIL/SOP/05
	Silt	%	19.47	26.89	UTRL/LAB/SOIL/SOP/05
2	pH(1:2.5 Suspension)	-	8.12	6.96	IS: 2720 (Part-26),1987
3	Electrical Conductivity	µmhos/cm	486.4	432.7	IS: 14767
4	Potassium (as K)	mg/kg	127.00	227.81	UTRL/LAB/SOIL/SOP/07
5	Sodium (as Na)	mg/kg	259.81	380.98	UTRL/LAB/SOIL/SOP/06
6	Calcium (as Ca)	mg/kg	4345.30	4485.15	UTRL/LAB/SOIL/SOP/08
7	Magnesium (as Mg)	mg/kg	707.55	681.63	UTRL/LAB/SOIL/SOP/08
8	Sodium Absorption Ratio	-	0.96	1.40	UTRL/LAB/SOIL/SOP/14
9	Water Holding Capacity	%	30.46	52.06	UTRL/LAB/SOIL/SOP/11
10	Total Kjeldahl Nitrogen	%	0.093	0.079	UTRL/LAB/SOIL/SOP/15
11	Phosphorous	mg/kg	72.86	72.64	UTRL/LAB/SOIL/SOP/09
12	Bulk Density	gm/cc	1.33	1.29	UTRL/LAB/SOIL/SOP/10
13	Organic Matter	%	1.27	1.19	IS: 2720 (Part-22)
14	Porosity	%	42.84	40.48	UTRL/LAB/SOIL/SOP/17

End Of Report

Note:-

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For Ultra Testing & Research Laboratory

Checked By

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-16072022-02 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Aami Nadi at Dadauna
Block/District : Khajni Block /Gorakhpur
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.15	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	25.4	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	14.2	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	458.8	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	25	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	164	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.6	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	23.04	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	21.00	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	19.57	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.87	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	284	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-16072022-02

TECHNICAL MANAGER

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15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	144.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	23.15	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.72	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	15.65	mg/l					
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	5.05	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	3.02	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

Archana
Checked By

(Authorized Signatory)

Assuring you of best our services at all times.

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-16072022-02 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Aami Nadi at Dadauna
Block/District : Khajni Block /Gorakhpur
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	612	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-16072022-03 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Kuwano River at Trilokpur
Block/District : Belghat Block /Gorakhpur
Sampling Procedure : IS 3025(Part-01)
Sample Quantity : 2.0 Litre
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.33	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	26.1	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	3.4	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	407.7	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	28	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	144	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.4	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	36.48	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	14.77	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	13.70	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.76	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.16	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	253	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-16072022-03

TECHNICAL MANAGER

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Contd. To report Code: WW-16072022-03

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	152.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	20.81	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.48	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	9.59	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	3.09	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	2.32	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	17.60	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER

(Authorized Signatory)

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-16072022-03 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Kuwano River at Trilokpur
Block/District : Belghat Block /Gorakhpur
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	468	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-16072022-04 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 14/07/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: GhaghraNadi at Kamhariya Ghat
Block/District	: Belghat Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.43	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	26.2	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	9.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	292.7	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	54	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	88	mg/l					
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.00	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.6	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	16.64	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	15.16	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	9.78	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.96	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	181	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-16072022-04

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Contd. To report Code: WW-16072022-04

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	104.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	25.79	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	8.86	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	6.85	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	2.21	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.93	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	16.00	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

Archana
Checked By

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-16072022-04 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 14/07/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : GhaghraNadi at Kamhariya Ghat
Block/District : Belghat Block /Ambedkar Nagar
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	386	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
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4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-16072022-05 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 14/07/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: ChotiSaryu at ItoriKhalispur
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.15	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	25.8	^{O}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	19.6	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	388.7	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	14	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	152	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	3.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.5	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	23.68	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	21.58	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	3.91	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.75	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	<0.1	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	241	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-16072022-05

TECHNICAL MANAGER

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Contd. To report Code: WW-16072022-05

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	148.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	25.50	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	0.92	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	2.74	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	0.91	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.23	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	17.60	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

TECHNICAL MANAGER

Checked By

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-16072022-05 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 14/07/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: ChotiSaryu at ItoriKhalispur
Block/District	: Jalal Pur Block /Ambedkar Nagar
Analysis Duration	: 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	542	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

(Authorized Signatory)

Assuring you of best our services at all times.

ULTRA TESTING & RESEARCH LABORATORY

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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-16072022-06 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 14/07/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Tons River at Chodahprass
Block/District	: Jalal Pur Block /Ambedkar Nagar
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.60	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	26.1	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	3.1	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	518.2	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	16	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	168	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	26.88	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	24.49	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	39.14	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.97	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.18	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	321	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-16072022-06

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

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Website: http://www.ultralabnoida.com

TC-8198

Contd. To report Code: WW-16072022-06

15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	168.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	12.75	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.85	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	27.40	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	9.13	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	1.05	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	14.40	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

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TEST REPORT

Surface Water Sample Analysis

Report Code: WW-16072022-06 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 14/07/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Tons River at Chodahprass
Block/District : Jalal Pur Block /Ambedkar Nagar
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	580	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
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Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Archana
Checked By

TECHNICAL MANAGER
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TC-8198

TEST REPORT

Surface Water Sample Analysis
Discipline/Group-Chemical/Water

Report Code: WW-16072022-01 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES**
326-AB,3RD FLOOR, SAHARA SHOPPING CENTER,
FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA

Project Name	: Development of Gorakhpur Link Expressway The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.
Sample Drawn On	: 13/07/2022
Sample Drawn By	: UTRL
Sample Description	: Surface Water
Sampling Location	: Majohi River
Block/District	: Piprauli Block /Gorakhpur
Sampling Procedure	: IS 3025(Part-01)
Sample Quantity	: 2.0 Litre
Analysis Duration	: 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	pH	IS:3025(Part-11)	7.46	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5
2	Temperature	IS:3025(Part-09)	25.8	^{o}C	-	-	-	-	-
3	Turbidity	IS:3025(Part-10)	17.8	NTU	-	-	-	-	-
4	Conductivity @25°C	IS:3025(Part-14)	532.8	µs/cm.	-	-	-	1000	2250
5	Total Suspended Solid	IS:3025(Part-17)	68	mg/l	-	-	-	-	-
6	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	184	mg/l	-	-	-	-	-
7	Biological Oxygen Demand (Max.) (at 27°C for 3 days)	IS:3025(Part-44)	2.50	mg/l	2	3	3	-	-
8	Dissolved Oxygen (as O_2) Min.	IS:3025(Part-38)	7.8	mg/l	6	5	4	4	-
9	Calcium(as Ca)	IS:3025(Part-40)	34.40	mg/l	80	-	-	-	-
10	Magnesium(as Mg)	IS:3025(Part-46)	20.90	mg/l	24	-	-	-	-
11	Chloride(as Cl),Max	IS:3025(Part-32)	23.48	mg/l	250	-	-	-	600
12	Iron(as Fe),Max	IS:3025(Part-53)	0.73	mg/l	0.3	-	50	-	-
13	Fluoride(as F),Max	IS:3025(Part-60)	0.13	mg/l	1.5	1.5	1.5	-	-
14	Total Dissolved Solid	IS:3025(Part-16)	330	mg/l	500	-	1500	-	2100

Contd. To report Code: WW-16072022-01

TECHNICAL MANAGER

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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TC-8198

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15	Total Hardness (as $CaCO_3$)	IS:3025(Part-21)	172.00	mg/l	300	-	-	-	-
16	Sulphate (as SO_4)Max	IS:3025(Part-24)	28.87	mg/l	400	-	400	-	1000
17	Phosphate (as P)	IS:3025(Part-31)	1.07	mg/l	-	-	-	-	-
18	Sodium (as Na)	IS:3025(Part-45)	18.79	mg/l	-	-	-	-	-
19	Manganese (as Mn)	IS:3025(Part-59)	<0.1	mg/l	0.5	-	-	-	-
20	Total Chromiun (as Cr)	IS:3025(Part-52)	<0.05	mg/l	0.05	0.05	0.05	-	-
21	Zinc (as Zn)	IS:3025(Part-49)	<0.1	mg/l	15	-	15	-	-
22	Potassium (as K)	IS:3025(Part-45)	6.06	mg/l	-	-	-	-	-
23	Nitrate (as NO_3),Max	IS: 3025 (Part-34)	2.65	mg/l	20	-	50	-	-
24	Cadmium (as Cd)	IS-3025(Part-41)	<0.01	mg/l	0.01	-	0.01	-	-
25	Lead (as Pb)	IS:3025(Part-47)	<0.01	mg/l	0.1	-	0.1	-	
26	Copper (as Cu)	IS:3025(Part-42)	<0.01	mg/l	1.5	-	1.5	-	-
27	Chemical Oxygen Demand (asO_2)	IS-3025(Part-58)	12.80	mg/l	-	-	-	-	-
28	Arsenic (as As)	IS:3025(Part-37)	<0.01	mg/l	0.05	0.2	0.2	-	

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
Class B-Water for outdoor bathing.
Class C-Drinking water with conventional treatment followed by disinefection.
Class D-Water for fish culture and wild life propagation.
Class E-Water for irrigation, industrial cooling and control waste disposal.

Note:-

1. The results given above are related to the tested sample, for various parameters, as observed at the time of sampling. The customer asked for the above tests only.
2. This test report will not be used for any publicity/legal purpose.
3. The test samples will be disposed off after two weeks from the date of issue of test report, unless until specified by the customer.
4. The Report can not be used as evidence in a court of law without the written approval of the lab.

For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)

ULTRA TESTING & RESEARCH LABORATORY

(An ISO 9001:2015, ISO 45001:2018, ISO 14001:2015 Certified)
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TEST REPORT

Surface Water Sample Analysis

Report Code: WW 16072022-01 **Issue Date: 21/07/2022**

ISSUED TO : **GLOBUS ENVIRONMENT ENGINEERING SERVICES 326-AB,3RD FLOOR, SAHARA SHOPPING CENTER, FAIZABAD ROAD,LUCKNOW,U.P.-226016,INDIA**

Project Name : Development of Gorakhpur Link Expressway
The proposed greenfield alignments starts from underpass near Jaitipur at Gorakhpur bypass and ends at Poorvanchal Expressway at 190.6 km with a total length of 91.352 km.

Sample Drawn On : 13/07/2022
Sample Drawn By : UTRL
Sample Description : Surface Water
Sampling Location : Majohi River
Block/District : Piprauli Block /Gorakhpur
Analysis Duration : 16/07/2022 To 21/07/2022

RESULTS

S.No	Parameter	Test Method	Results	Units	Tolerance Limit as per IS:2296				
					Class A	Class B	Class C	Class D	Class E
1	Total Coli Form	IS:1622	424	MPN/100ml	50	500	5000	-	-

End Of Report

Remarks:-

Class A-Drinking water without conventional treatment but after disinfection.
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Note:-

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For ULTRA TESTING & RESEARCH LABORATORY

Checked By

TECHNICAL MANAGER

(Authorized Signatory)