

**REPORT
ON
TRAFFIC STUDY INCLUDING
ASSESSMENT OF ITS IMPACTS DUE TO
TRANSPORTATION OF COAL BY ROAD
FROM**

- 1. BEDIA RAILWAY SIDING**
- 2. DHAKALGAON RAILWAY SIDING**
- 3. MPPKGCL SINGHAJI PLANT SIDING**
- 4. BEED RAILWAY SIDING**
- 5. M/S NEPA LTD.'S RAILWAY SIDING AND**
- 6. KHANDWA GOODS YARD**

**TO
2X660 MW KHARGONE SUPER THERMAL POWER
PROJECT
AT
TEHSIL BARWAH, DISTRICT KHARGONE,
MADHYA PRADESH
OF
M/s NTPC Ltd.**

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CONTENTS

Sl. No.	Description	Page No.
1.0	Introduction	1
1.1	Description of proposed transportation route	2
1.2	Quantity of coal to be transported	3
2.0	Assessment of proposed road for its categorisation & carrying capacity as per IRC 64(1990)-guidelines on capacity of roads in rural area and IRC 103 (1990)-guidelines on capacity of roads in urban area	5
2.1	Road width measurement	5
2.2	Traffic volume carrying capacity of the road	7
2.3	Traffic survey	12
2.4	Additional traffic on proposed route	14
2.5	Growth in existing traffic	15
2.6	Summary and conclusion regarding increase in traffic	19
3.0	Satellite images from Google earth	19
3.1	Village & Habitation Study	19
3.2	Plantation Study	23
4.0	Collection of environmental data	26
4.1	Ambient air quality	26
4.2	Noise environment	29
4.3	Opinion survey, Health & Accident data	30
5.0	Impact due to traffic	31
5.1	Ambient Air Quality	31
5.2	Ambient noise	33
5.3	Human health	35
5.4	Ecology	37
6.0	Observations	37
7.0	Conclusion and recommendations	49
7.1	Conclusion	49
7.2	Recommendations	52

LIST OF TABLES

Table No.	Particulars	Page No.
1	Description of the various road routes connecting railwaysiding and plant	3
2	Summaryof route wise width, category and type of road	7
3	Recommended design service volumes for plain roads with low curvature as per IRC: 64-1990	9
4	Capacity reduction factors suggested for sub-standard lane and shoulder width on two-lane road	9
5	Equivalency factors as per IRC: 64-1990	10
6	Recommended design service volumes (PCU's per hour) as per IRC: 106-1990	11
7	Equivalency factors as per IRC: 106-1990	11
8	Traffic census point location on various routes	12
9	Additional traffic on proposed route under worst case scenario	14
10	Carrying capacity calculation for road length from various railway siding to Khargone STPP	16
11	Location of villages and their population	20
12	Percentage of route lengths passing through forests	23
13	Various reserved forests falling within 100 m width along the transportation routes	23
14	List of plant species along routes	24
15	Route wise summary of ambient air quality	26
16	Ambient air quality at monitoring stations along routes	27
17	Noise levels at sampling stations along routes	29
18	Calculation of emission from exhausts and airborne road dust due to tyres of tipping trucks	31
19	Resultant air quality after air quality prediction modelling for worst case scenarios	32

LIST OF FIGURES

Figure No.	Particulars	Page No.
1	Proposed railway line and route alignment from various sidings to Khargone STPP with location codes of road measurement & traffic census points	4
2	Line diagram of road widths	6
3	Villages along the different routes	22
4	Forests along the different routes	25
5	Location of air and noise sampling stations	28

LIST OF ANNEXURES

Annexure No.	Particulars
1	Environmental Clearance vide letter No. J-13012/54/2010-IA.II(T) dated 31 st March, 2015.
2	Route wise details of road sections and lengths
3	Photographs of road width measurement locations
4	Photographs of traffic census point locations
5	Traffic volume monitored in November-December 2018
6	Air Quality Prediction Modelling
7	Satellite images from Google earth

1.0 INTRODUCTION

M/s NTPC Ltd. is installing Khargone Super Thermal Power Project (Khargone STPP) having capacity of 1320 MW (2x660 MW) at villages Selda and Dalchi in Barwah Tehsil of Khargone District, Madhya Pradesh. The coordinates of the plant site are located within latitude 22°03'11"N to 22°04'13" N and longitude 75°50'49" E to 75°52'26" E. The coal requirement for both the units of Khargone STPP is estimated as 6.51 MTPA and the coal demand shall be met from Pakri Barwadih Coal Mine Block (PBCMB), Jharkhand of NTPC Ltd.

Environment Clearance (EC) for the Khargone STPP had been granted by MoEF&CC vide letter No. J-13012/54/2010-IA.II(T) dated 31st March, 2015. Copy of the EC letter is attached as **Annexure 1**. The EC letter states in Specific condition no. (i) that "Coal transportation shall be by rail only." The project is in its advanced stage of completion, Unit-1 (660 MW) is expected to be commissioned by 31.03.2019.

NTPC had proposed coal transportation from PBCMB to Plant by means of Indian Railway. The nearest rail head is at Nimarkhedi on Indore-Khandwa rail line, about 37 Km from Khargone STPP plant. The coal transportation from PBCMB to Plant through Indian Railway will be in two parts as follows:

1. **Part-I:** Pakri Barwadih to Nimarkhedi rail head (about 1500 km.) through the tracks of Indian Railways. It also involves conversion of meter gauge to broad gauge by Indian Railway for Khandwa to Nimarkhedi Section, which has been delayed and likely to be completed by March, 2019
2. **Part-II:** From Nimarkhedi to Khargone project through a 37 km long dedicated railway line of NTPC. This line is being built up by NTPC through M/s RITES; which has also been delayed and expected to be ready by December 2019. The railway corridor from Nimarkhedi to plant site can be seen in **Fig 1**.

As the Unit 1 (660 MW) is expected to be commissioned by 31.03.2019, NTPC Ltd. is planning to transport coal from PBCMB to nearby available railway siding by rail and from there to plant site by road through 20 tonne tippers/ dumpers as a contingency arrangement for one year or till commissioning of railway line, whichever is earlier.

For this purpose, four existing railway sidings, namely MPPKGCL Singhaji Plant Siding, Beed Railway Siding, M/s Nepa Ltd.'s Railway Siding and Khandwa Goods Yard have been identified by NTPC Ltd. It may be noted that two railway sidings at Dhakalgaon and Bedia village are proposed for construction by NTPC as a part of the railway siding corridor from Nimarkhedi to NTPC Plant. Dhakalgaon siding is already under construction at present and both the proposed railway sidings are expected to be ready by June/ July, 2019. Hence, total 6 railway sidings will be available for

NTPC Ltd. to unload coal and transport the same by road. Location of these six railway siding can be seen in **Fig. 1**.

It may be noted that the that transportation of the commissioning coal is envisaged from any of the existing four railway siding *i.e. MPPKGCL Singhaji Railway Siding, Beed Railway Siding, M/s Nepa Ltd.'s Railway Siding and Khandwa Goods Yard*.

However, once the MG to BG Conversion of Khandwa-Nimarkhedi is completed by Indian Railways and sidings up to Bediya or Dhakalgaon railway sidings are completed by RITES, the coal shall be transported through these two siding only.

To assess the impact due to the proposed transportation of coal by road from various existing/ proposed railway sidings to plant site, the traffic impact assessment study has been carried out with the following objective:

3. Traffic and road surveys for assessment of carrying capacity on the proposed routes,
4. Monitoring of air quality and noise levels along the proposed routes,
5. Air quality modelling for impact assessment of incremental ground level concentration of air pollutants,
6. Data collection regarding public health, opinion survey and flora along the road, and
7. Survey of flora, identification of villages and forest within 100 m of the proposed route.

The road width measurement, traffic surveys, collection of air quality and noise data, air quality prediction modelling, data collection regarding health status of the villagers along the route, details of vegetation along the route etc. has been carried out by staff of M/s Min Mec Consultancy Pvt. Ltd. and M/s Min Mec R&D Laboratory, New Delhi (NABL accreditation certificate no. TC-6337) between 21th November to 22nd December, 2018.

1.1 Description of Proposed Transportation Route

The coal transportation to Khargone STPP will be from 6 railway sidings (existing/ under implementation). Therefore, 6 road routes connecting respective railway sidings were surveyed.

They have been named as "Route-1", "Route-2", "Route-3", "Route-4", "Route-5" and "Route-6", for the purpose of this study. These six routes are shown in **Fig. 1** and summarised in **Table 1**.

TABLE 1
DESCRIPTION OF THE VARIOUS ROAD ROUTES CONNECTING
RAILWAY SIDING AND PLANT

Route No.	Siding Name to plant	Route Length, km
Route-1	Bediya railway siding to plant via Beriya and Roriya	22.6
Route-2	Dhakalgaon railwaysiding to plant via Sanawad, Beriya and Katora	46.0
Route-3	MPPKGCL Singhaji plantsiding to plant via Mundi, Mohana, Sanawad, Beriya and Katora	97.4
Route-4	Beed Railway siding to plant via Mundi, Mohana, Sanawad, Beriya and Katora	98.1
Route-5	Nepa Ltd.'s railway siding to plant via Sanawad, Beriya and Katora	145.2
Route-6	Khandwa Goods Yard to plant via Sanawad, Beriya and Katora	97.2

1.2 Quantity of coal to be transported

NTPC Ltd. proposes to evacuate maximum 3 rake of coal in a week with capping of 2000 TPD of coal transportation by road from any one of the railway sidings amongst the six proposed (at particular point of time). However, it may be noted that coal will be unloaded preferably on the nearest sidings (Bediya or Dhakalgaon) when it gets completed. Before completion of Bediya or Dhakalgaon siding, the coal is proposed to be unloaded at any one siding at a time amongst 4 existing i.e. MPPKGCL Singhaji Plant Siding, Beed Railway Siding, M/s Nepa Ltd.'s Railway Siding and Khandwa Goods Yard. The amount of coal likely to be transported from the siding and corresponding to & fro tippers movements are given below:

- a) No. of rakes of coal proposed to be unloaded in one week = 3
- b) Total coal in one week = $3750 \text{ T} \times 3 = 11,250 \text{ T}$
- c) The entire coal from Rly. Siding will be transported over 5-6 days ~ with maximum capping of 2000 TPD
- d) Capacity of tippers/trucks = 20 T
- e) Daily to & fro movement of tippers (maximum) = 200 (equivalent to 100 trips)

The maximum (Peak) 2000 TPD of coal and corresponding movement of 200 tippers per day on all routes has been considered for impact assessment on traffic volume, carrying capacity of road, on air and noise quality. However, it may be noted that any one siding will be used at one time. Further, the unloaded coal from one rake i.e. 3750 Tonne of coal will be transported over two day. Hence, in reality the impact will always be lower than the peak.

2.0 ASSESSMENT OF PROPOSED ROAD FOR ITS CATEGORISATION & CARRYING CAPACITY AS PER IRC 64(1990)-GUIDELINES ON CAPACITY OF ROADS IN RURAL AREA AND IRC 103 (1990)-GUIDELINES ON CAPACITY OF ROADS IN URBAN AREA

2.1 Road width measurement

On all the six routes, the width of the road was measured by using meter tape. Since, the road width was not uniform, the road length was traversed till the road width changed and at that location, road width was measured again. Thus, at a total of 169 locations road width measurement was carried out on all the five routes. The locations at which the road width has changed have been marked as "RW" and shown in **Fig. 1**. The road widths measurement location along with their geographical coordinates, road widths, shoulders, type of road etc. along all the six routes are given in **Annexure 2**.

The lengths of the sections of roads were measured after marking the geographical coordinates in Google Earth and importing the kml file created into Auto-CAD. The map showing the road width of the entire road and the lengths for which a road width has prevailed can be seen in **Fig. 2**. Photographs have been taken at the locations at which width has been measured. These are shown in **Annexure 3**. Each location refers to its corresponding photograph number.

As per Guideline of IRC: 64 (1990), the width of single lane road is <5.5 m, intermediate roads have width of 5.5 to <7 m, two lane road is 7.0 to <10 m and multi lane road has a width ≥ 10 m. From **Fig. 2**, route wise length, width of the roads w.r.t to category and type of road are summarized in **Table 2** subsequently.

It is prudent to note that:

1. About 6.8 km length of the road from RW-24 to RW-34 i.e from Dhakalgaon to Sanawad was being widened to 5.5 m from its current width of 3.3-3.8 m. Out of 6.8 km, 1.5 km is already widened and the widening of left out patches is underway.
2. Besides above, two patches of Route-5 i.e. RW-131 to RW-132 and RW-133 to RW-134 is having road width 2.3 m and 2.5 m, respectively. The sum of length of these two patches is only 0.5 km. These two stretches pass over two separate old bridges. Near both the stretches, new bridges are under construction. After completion of construction, the route will be shifted to the new bridges. Currently, vehicles are passing over the existing old bridge.
3. During site visit, sharp turn through densely populated area at Barud village was observed which will require manned supervision by NTPC to allow smooth flow of traffic at this turn.

FIG. 2: LINE DIAGRAM OF ROAD WIDTHS

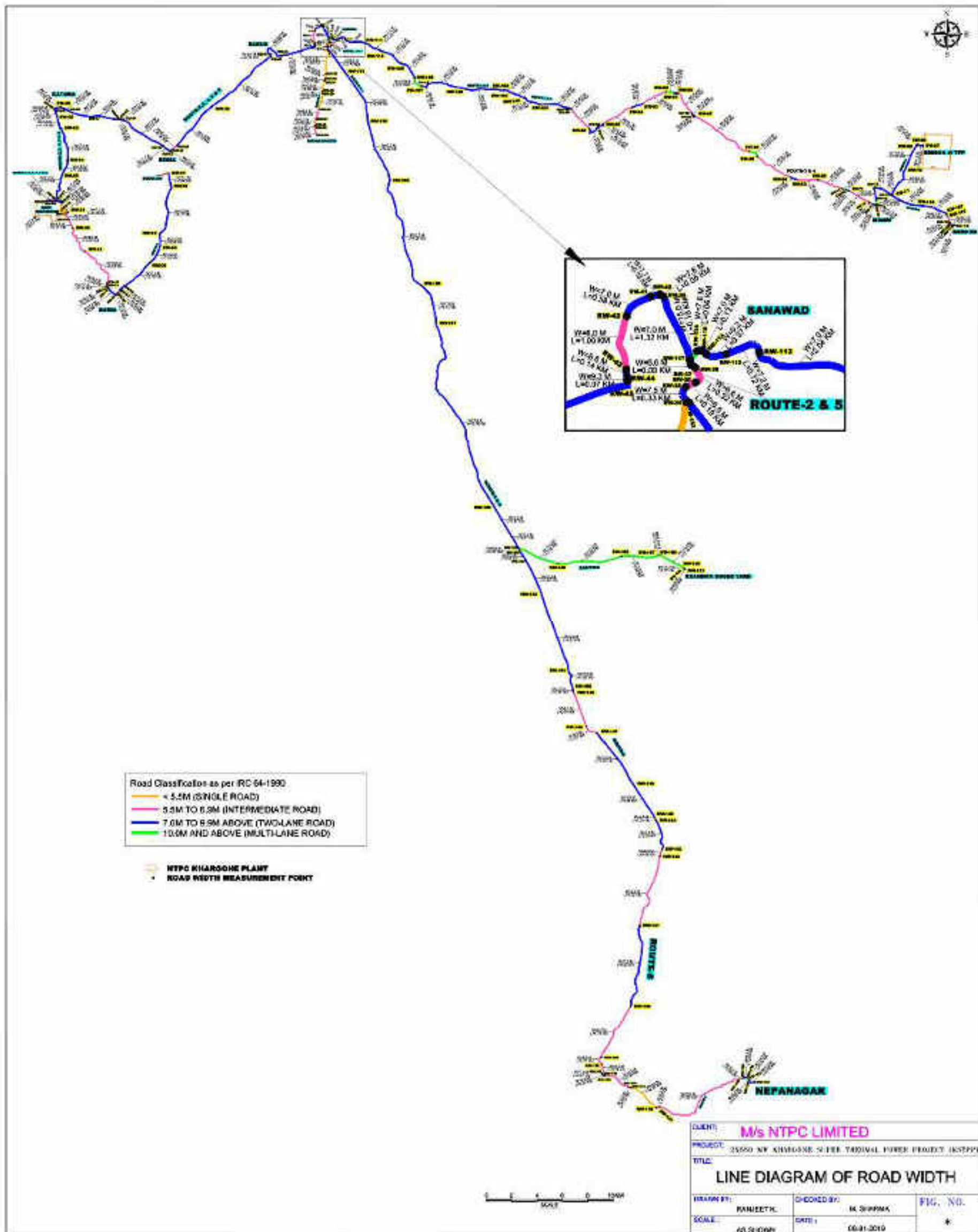


TABLE 2
SUMMARY OF ROUTE WISE WIDTH, CATEGORY AND TYPE OF ROAD

From Siding/ goods yard to Plant	via Route No.	Length, km	Length of Stretch (in km) w.r.t. category				Type of road		
			Single Lane (<5.5 m)	Inter-mediate (>=5.5 m)	Two Lane (> 7 m)	Multi-lane (>=10 m)	Black Top	Con-crete	WBM/ Haul road
1. Bediya railway siding	Route-1	22.6	1.2	8.0	13.4	0.0	22.3	0.3	0
NTPC proposed widening of single lane (1.2 km) to 5.5 m and then after widening		22.6	0	9.2	13.4	0.0	22.3	0.3	0
2. Dhakalgaon railway siding									
Before widening of patch RW-24 to RW-34	Route-2	46.0	5.4	3.9	36.7	0.0	42.6	3.4	0
After Widening		46.0	0	9.3	36.7	0.0	37.2	6.8	0
3. Singhaji plant siding	Route-3	97.4	0.0	25.2	68.8	3.3	91.1	6.3	0
4. Beed Railway siding	Route-4	98.1	0.1	26.2	68.5	3.3	91.9	5.8	0.4
After strengthening and widening of 0.1 km of stretch to 5.5 m by NTPC		98.1	0	26.3	68.5	3.3	91.9	5.8	0.4
5. Nepa Ltd.'s railway siding									
Before widening of patch RW-131 to RW-132 & RW-133 to RW-134 i.e 0.5 km	Route-5	145.2	3.6	29.4	112.0	0.2	142.1	3.2	0
After Widening		145.2	3.1	29.9	112.0	0.2	142.1	3.2	0
6. Khandwa Goods Yard	Route-6	97.2	0.0	2.4	81.0	13.8	95.2	2.0	0.0

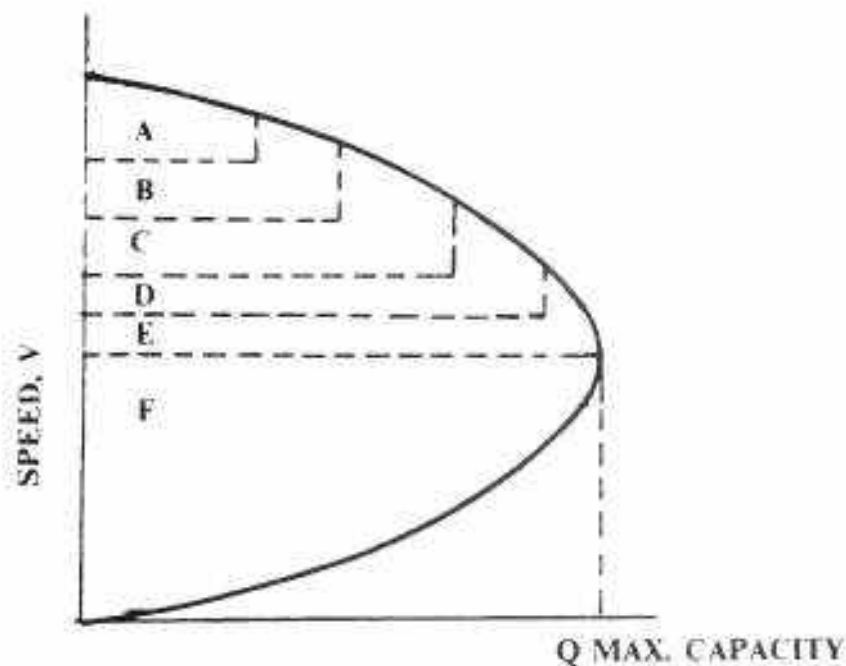
2.2 Traffic Volume Carrying Capacity of the Road

2.2.1 Roads in Rural Areas

In the study, maximum part of the route considered is a highway passing through rural areas. These highways are considered as an all-purpose road, with no control of access and with heterogeneous mix of fast and slow-moving vehicles.

There are three terms which are to be considered - (i) Capacity, (ii) Design Service Volume and (iii) Level of Service.

- (i) **Capacity** is defined as the maximum hourly volume (Vehicles per hour) at which vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under the prevailing roadway, traffic and control conditions.
- (ii) **Design Service Volume (DSV)** is defined as the maximum hourly volume (Vehicles per hour) at which vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under the prevailing roadway, traffic and control conditions while maintaining a designated level of service.
- (iii) **Level of service (LoS)** is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by drivers/ passengers. Level of service definition generally describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort, convenience and safety. Six level of services are recognised commonly, designated from A to F, with level of service A representing the best operating condition (i.e free flow) and level of service F the worst (i.e. forced or break-down flow). The figure below shows various level of service in the form of indicative volume flow condition:



Under normal circumstance, use of Level of Service “B” (available from A to F) is considered adequate for the design of rural highways i.e. design service volume (DSV) is at LoS B. At this level, “design service volume” of traffic will be around 0.5 times the “maximum capacity”.

The recommended design service volume for plain roads with low curvature (0-50 degrees/km), as is the case in the study area, is given in **Table 3**.

TABLE 3
RECOMMENDED DESIGN SERVICE VOLUMES FOR PLAIN ROADS
WITH LOW CURVATURE AS PER IRC: 64-1990

Type of Road	Description	Recommended Design Service Volume in PCU/day
Single Lane Roads	A single lane bi-directional road should have at least 3.75 metre wide paved carriageway with good quality shoulders such as moorum shoulders of minimum 1.0 metre width on either side.	2000
Intermediate Lane Roads	Intermediate lane roads should have a pavement width of around 5.5 metre with good usable shoulders on either side.	6000
Two Lane Roads	Two lane roads shall have a 7 metre wide carriageway and good earthen shoulders.	15000
Two Lane Roads +	Two lane roads + paved & surface shoulders of atleast 1.5 m width on either side.	17250

Source: Table 3, 4, 5 and section 10.3 of guidelines for capacity of roads in rural area (IRC: 64-1990)

It is recommended that tentatively, a value of 35,000 PCUs can be adopted for four-lane divided carriageways located in plain terrain. It is assumed for this purpose that reasonable good earthen shoulders exist on the outer side, and a minimum 3.0 m wide central verge exists.

In case of two lane roads, where the shoulder width or carriageway width on a two lane road are restricted, there will be a certain reduction in capacity. **Table 4** gives the recommended reduction factors in this account over the capacity values given in **Table 3**.

TABLE 4
CAPACITY REDUCTION FACTORS SUGGESTED FOR
SUB-STANDARD LANE AND SHOULDER WIDTH ON TWO-LANE ROAD

Usable shoulder width, m	3.50 m lane	3.25 m lane	3.00 m lane
≥ 1.8	1.0	0.92	0.84
1.2	0.92	0.85	0.77
0.6	0.81	0.75	0.68
0	0.70	0.64	0.58

Source: Table 5 of guidelines for capacity of roads in rural area (IRC: 64-1990)

The result of presence of slow moving vehicles in traffic stream is that it affects the free flow of traffic. A way of accounting for the interaction of various kind of vehicles is to express the capacity of roads in terms of common unit. Therefore, the number of vehicles have been converted into “passenger car units” (PCUs) using the equivalency factor as per Table 1 of IRC: 64-1990. The equivalency factors used have been given in **Table 5** below.

TABLE 5
EQUIVALENCY FACTORS AS PER IRC: 64-1990

Sl. No.	Vehicle type	Equivalency factor
	Fast vehicles	
1	Motor cycle or scooter	0.50
2	Passenger car, pickup van or auto-rickshaw	1.00
3	Agricultural tractor, light commercial vehicle	1.50
4	Truck and Bus	3.00
5	Truck-trailer, Agricultural Tractor-trailer	4.50
	Slow vehicles	
6	Cycle	0.50
7	Cycle rickshaw	2.00
8	Hand cart	3.00
9	Horse drawn vehicle	4.00
10	Bullock cart	8.00

Source: Table 1 of guidelines for capacity of roads in rural area (IRC: 64-1990)

2.2.2 Urban roads

Some part of the roads in this study are falling in urban areas and have been considered as urban roads. The carrying capacity of urban roads is different from rural roads.

Capacity of urban roads is also a function of the roadside fringe conditions, e.g. parking, extent of commercial activities, frontage access etc. For purpose of recommendations given further on, the following fringe conditions are assumed:

- Arterials** : No frontage access, no standing vehicles, very little cross traffic
- Sub-arterials** : Frontage development, side roads, bus stops, no standing vehicles, waiting restrictions
- Collectors** : Free frontage access, parked vehicles, bus stops, no waiting restrictions

Design service volumes for different categories of urban roads corresponding to above referred conditions are given in **Table 6**.

TABLE 6
RECOMMENDED DESIGN SERVICE VOLUMES (PCU'S PER HOUR)
AS PER IRC: 106-1990

Sl. No.	Type of carriageway	Total Design Service Volumes for Different Categories of Urban Roads		
		Arterial*	Sub-arterial**	Collector***
1.	2-Lane (One-Way)	2400	1900	1400
2.	2-Lane (Two-Way)	1500	1200	900
3.	3-Lane (One-Way)	3600	2900	2200
4.	4-Lane Undivided (Two-Way)	3000	2400	1800
5.	4-Lane Divided (Two-Way)	3600	2900	-
6.	6-Lane Undivided (Two-Way)	4800	3800	-
7.	6-Lane Divided (Two-Way)	5400	4300	-
8.	8-Lane Divided (Two-Way)	7200	-	-

*: Roads with no frontage access, no standing vehicles, very little cross traffic.

**: Roads with frontage access but no standing vehicles and high capacity intersections.

***: Roads with free frontage access, no standing vehicles, very little cross traffic.

Under normal circumstances, it is recommended that normally Level of Service C be adopted for design of urban roads. At this level, volume of traffic will be around 0.70 times the maximum capacity and this is taken as the “design service volume” for the purpose of adopting design values.

The equivalent PCU of different vehicle categories do not remain constant under all circumstances. Rather, these are a function of the physical dimensions and operational speeds of respective vehicle classes. In urban situations, the speed differential amongst different vehicle classes is generally low, and as such the PCU factors are predominantly a function of the physical dimensions of the various vehicles. Nonetheless, the relative PCU of a particular vehicle type will be affected to a certain extent by increase in its proportion in the total traffic. Considering all these factors, the conversion factors as shown in **Table 7** are recommended for adoption.

TABLE 7
EQUIVALENCY FACTORS AS PER IRC: 106-1990

Sl. No.	Vehicle type	Equivalency PCU factor	
		Percentage Composition of Vehicle type in traffic stream	
		5%	10% and above
	Fast vehicles		
1	Two wheelers, Motor cycle or scooter	0.50	0.75
2	Passenger car, pickup van	1.00	1.00
3	Auto-Rickshaw	1.20	2.00

Sl. No.	Vehicle type	Equivalency PCU factor Percentage Composition of Vehicle type in traffic stream	
		5%	10% and above
4	Light commercial vehicle	1.40	2.00
5	Truck or Bus	2.20	3.70
6	Agricultural Tractor Trailer	4.00	5.00
	Slow vehicles		
7	Cycle	0.40	0.50
8	Cycle rickshaw	1.50	2.00
9	Tonga (Horse drawn vehicle)	1.50	2.00
10	Hand cart	2.00	3.00

2.3 Traffic Survey

The traffic census (survey) was conducted at 27 location on various routes as per IRC: 9-1972. The list of traffic census locations is given in **Table 8**. The sites for traffic survey monitoring were fixed away from the villages or intersections, to the extent possible. The traffic volume was monitored in the up and down directions of the following locations:

TABLE 8
TRAFFIC CENSUS POINT LOCATION ON VARIOUS ROUTES

Census Point	Location name	Category (Urban/Rural)	On route					
			1	2	3	4	5	6
CP-1	Near Katora village (On Katora to Plant road)	Rural		√	√	√	√	√
CP-2	Near Katora village (On Katora to Beriya road)	Rural		√	√	√	√	√
CP-3	Near Kheri Buzurg	Rural	√					
CP-4	Near Roriya village	Rural	√					
CP-5	Near Bagda Buzurg (On Rodia to Bedia road)	Rural	√					
CP-6	Near Beriya village	Rural		√	√	√	√	√
CP-7	Near Issar pump, Barud	Rural		√	√	√	√	√
CP-8	Near Barud village	Rural		√	√	√	√	√
CP-9	Sanawad by-pass	Urban		√	√	√	√	√
CP-10	Near Indian Oil Pump, Sanawad	Urban		√	√	√	√	√

Census Point	Location name	Category (Urban/Rural)	On route					
			1	2	3	4	5	6
CP-11	Near Railway crossing, Sanawad	Urban			√	√		
CP-12	Near Dhauli Mohalla, Sanawad	Urban			√	√		
CP-13	Near Sulgaon Village	Rural			√	√		
CP-14	Near Mundi, Singha Ji Plant road	Rural			√			
CP-15	Near Devlan village	Rural			√	√		
CP-16	Near River Bridge at Sanawad	Urban		√			√	√
CP-17	Near Dhakalgaon village	Rural		√				
CP-18	Near Dhangaon Village	Rural					√	√
CP-19	Near Deshgaon Village	Rural					√	√
CP-20	Near Jain Dhaba, Chhaigaon Makhan Village	Rural					√	√
CP-21	Near Police station, Chhaigaon Makhan village	Rural					√	
CP-22	Near Borgaon Village	Rural					√	
CP-23	Near Asir village	Rural					√	
CP-24	Nepanagar (on SH27 to Nepanagar road)	Urban					√	
CP-25	Near Bus Stand, Nepanagar	Urban					√	
CP-26	Near Chhaigaon Makhan Village on Khandwa road	Rural						√
CP-27	Near Khandwa goods yard	Urban						√

The locations can be seen in **Fig. 1** and their photographs in **Annexure 4**. The monitoring was done at each location for a period of 24 hours continuously. The observed traffic density was processed and total number of vehicles were calculated on hourly basis as well as for 24 hours. The monitoring plan included the following vehicles, namely, LMV, buses, trucks, motor cycles and scooters, cycles and others. Slow moving vehicles

produce interference to the free movement of traffic. Hence, to account for the interaction of different kinds of vehicles moving on the routes, the capacity of the roads has been converted into Passenger Car Unit as per IRC: 64-1990. The outcome of the monitoring after processing the raw data has been recorded in **Annexure 5** in terms of vehicle count to arrive at the current vehicle volume.

2.4 Additional Traffic on proposed route

For the purpose of this report, the worst possible scenario has been considered as described in Section 1.2 earlier. The traffic volume estimated due to the movement of tippers during transportation of coal from any of the railway siding to Khargone STPP are as given in **Table 9**. The calculations for the existing and proposed carrying capacity of the road under worst case scenario has been done in **Table 10**.

TABLE 9
ADDITIONAL TRAFFIC ON PROPOSED ROUTES UNDER WORST CASE SCENARIO

Particulars	From any one Railway at a time						Total under worst case on common stretches of proposed six routes
	Bediya	Dhaka-gaon	Singhaji plant	Beed	M/s Nepa Ltd.'s	Khandwa	
Proposed quantity of coal to be transported per day, T/day	2000	2000	2000	2000	2000	2000	2000
Available number of day for transportation of coal in a week	6	6	6	6	6	6	6
Available operational hour for transportation per day	24	16	16	16	16	16	On Route-1: 24 On Route-2-6: 16 (worse case)
Via route	Route-1	Route-2	Route-3	Route-4	Route-5	Route-6	
Carrying capacity of tippers, Tonnes	20	20	20	20	20	20	20
Hourly tipper movement (to & fro), nos.	9	13	13	13	13	13	13
Daily tipper movement, (to & fro), nos.	200	200	200	200	200	200	200

2.5 Growth in existing traffic

It is proposed to use the road for coal transportation till the dedicated railway line gets completed or till December, 2019 whichever is earlier. During this period, the existing road traffic is likely to experience a natural growth in future on account of the following factors:

Economic	1. Gross National Product (GNP) or Gross Domestic Product (GDP)
	2. Agricultural Output
	3. Industrial Output
Demographic	4. Population
	5. Rural/Urban mix of population

The natural growth can be assessed through various ways which relate to either one or more of the above parameters. Past trends of data related to traffic flow from census, vehicle registration or fuel sales can also be used, if available. In this case, being a rural road, past trend data was not available for sufficient number of years from authentic sources for extrapolations. Hence, a annual growth rate of 2.035% has been assumed on the basis of - 20.35% population growth rate in Madhya Pradesh in the previous decade, as per Census 2001 & 2011.

Transportation of coal by road has been proposed till December, 2019 and it will be approx 1 year from November- December, 2018, the period during which traffic study has been done. Therefore, the growth in traffic has been projected for next 1 year based on the formula prescribed by IRC:108-1996 (Guidelines for Traffic Prediction on Rural Highways) and same has been used in subsequent **Table 9**.

The formula used for projection is $P_n = P_o(1+r)^n$

Where

P_n = Traffic in the nth year

P_o = Traffic flow in the base year

n = number of years (1 year)

r = annual rate of growth of traffic, expressed in decimals. (0.0203 for Madhya Pradesh)

Table 10 is showing the existing traffic load, projected (after 1 years), additional and total future traffic load, road width, the design service volume according to road width, the maximum capacity and the percentage utilization of the DSV with respect to existing and future traffic after 1 years.

TABLE 10
CARRYING CAPACITY CALCULATION FOR ROAD LENGTH FROM VARIOUS RAILWAY SIDING TO KHARGONE STPP

Census Point No.	Location	CP lies on Route/ common for Routes	Total (Year Nov-Dec, 2018), PCU/hour	Projected Traffic for 1 year, PCU/hour	Additional KSTPP trucks/ hrs under worst case, Nos.	Additional proposed Traffic, PCU/ hour	Total resultant traffic in future, PCU/hr	Total resultant traffic in future after 1 year, PCU/hr	Width of road (m)	DSV#, PCU/hr	Maximum capacity#, PCU/hr	% utilised of DSV			
												Current in, 2018	In future	Resultant future (after 1 yr)	Increment
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)=(d)+(g)	(i)=(e)+(g)	(j)	(k)	(l)=(k)/0.7	(m)=w.r.t. (d)	(n)=w.r.t. (h)	(o)=w.r.t. (i)	(p)=(o)-(m)
	ROADS THROUGH URBAN AREAS														
CP-09	Sanawad by-pass - During peak - 7:00-8:00 AM	2, 3, 4, 5 & 6	442	451	13	39	481	490	7	1500	2142.9	29.5	32.1	32.7	3.2
CP-10	Near Indian Oil Pump, Sanawad - During peak - 12:00-1:00 PM	2, 3, 4, 5 & 6	2920	2979	13	39	2959	3018	7	1500	2142.9	194.7	197.3	201.2*	6.5
CP-11	Near Railway crossing, Sanawad - During peak - 4:00-5:00 PM	3 & 4	1846	1883	13	39	1885	1922	7.6	1500	2142.9	123.1	125.7	128.1*	5.1
CP-12	Near Dhauri Mohalla, Sanawad - During peak - 2:00-3:00 AM	3 & 4	845	862	13	39	884	901	7.2	1500	2142.9	56.3	58.9	60.1	3.7
CP-16	Near River Bridge at Sanawad - During peak - 3:00-4:00 PM	2, 5 & 6	1970	2010	13	39	2009	2049	7.5	1500	2142.9	131.3	133.9	136.6*	5.3
CP-24	Nepanagar (on SH27 to Nepanagar road) - During peak- 1:00-2:00 PM	5	203	207	13	39	242	246	5.1	1500	2142.9	13.5	16.1	16.4	2.9
CP-25	Near Bus Stand, Nepanagar - During peak- 5:00-6:00 AM	5	344	351	13	39	383	390	6	1500	2142.9	22.9	25.5	26.0	3.1
CP-27	Near Khandwa railway goods yard - During peak- 6:00-7:00 AM	6	1278	1304	13	39	1317	1343	8.2	1500	2142.9	85.2	87.8	89.5	4.3

Census Point No.	Location	CP lies on Route/ common for Routes	Total (Year Nov. 2018), PCU/Day	Projected Traffic for 1 year, PCU/day	Additional KSTPP trucks/ Day under worst case, Nos.	Additional proposed Traffic, PCU/day	Total resultant traffic in future, PCU/day	Total resultant traffic in future after 1 year, PCU/day	Width of road (m)	DSV#, PCU/day	Maximum capacity###, PCU/day	% utilised of DSV			
												Current in 2018	In future	Resultant future (after 1 year)	Increment
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)=(d)+(g)	(i)=(e)+(g)	(j)	(k)	(l)=(k)/0.5	(m)=w.r.t. (d)	(n)=w.r.t. (h)	(o)=w.r.t. (i)	(p)=(o)-(m)
	ROADS THROUGH RURAL AREAS														
CP-01	Near Katora village (Katora to Plant road)	2, 3, 4, 5 & 6	6158	6283	200	600	6758	6883	7	15000	30000	41.1	45.1	45.9	4.8
CP-02	Near Katora village (Katora to Beriya road)	2, 3, 4, 5 & 6	4709	4805	200	600	5309	5405	7	15000	30000	31.4	35.4	36.0	4.6
CP-03	Near Kheri Buzurg	1	2747	2803	200	600	3347	3403	6	6000	12000	45.8	55.8	56.7	10.9
CP-04	Near Roriya village	1	2057	2099	200	600	2657	2699	7	15000	30000	13.7	17.7	18.0	4.3
CP-05	Near Bagda Buzurg (Rodia to Bedia road)	1	4381	4470	200	600	4981	5070	7.1	15000	30000	29.2	33.2	33.8	4.6
CP-06	Near Beriya village	2, 3, 4, 5 & 6	5270	5377	200	600	5870	5977	7	15000	30000	35.1	39.1	39.8	4.7
CP-07	Near Issar pump, Barud	2, 3, 4, 5 & 6	5926	6046	200	600	6526	6646	7	15000	30000	39.5	43.5	44.3	4.8
CP-08	Near Barud village	2, 3, 4, 5 & 6	8584	8758	200	600	9184	9358	8.6	15000	30000	57.2	61.2	62.4	5.2
CP-13	Near Sulgaon Village	3 & 4	3932	4012	200	600	4532	4612	7.2	15000	30000	26.2	30.2	30.7	4.5
CP-14	Near Mundi, Singhaji Plant road	3	3699	3774	200	600	4299	4374	8	15000	30000	24.7	28.7	29.2	4.5
CP-15	Near Devlan village	3 & 4	3125	3188	200	600	3725	3788	5.6	6000	12000	52.1	62.1	63.1	11.1
CP-17	Near Dhakalgaon village -Before road widening	2	4647	4741	200	600	5247	5341	3.1	2000	4000	232.4	262.4	267.1*	34.7
	After Widening								5.5	6000	12000	77.5	87.5	89.0	11.6
CP-18	Near Dhangaon Village - at LoS B	5 & 6	14599	14895	200	600	15199	15495	7.3	15000	30000	97.3	101.3	103.3*	6.0
	at LoS C									21000		69.5	72.4	73.8	4.3
CP-19	Near Deshgaon Village	5 & 6	12073	12318	200	600	12673	12918	7.8	15000	30000	80.5	84.5	86.1	5.6
CP-20	Near Jain Dhaba, Chhaigaon Makhan Village - at LoS B	5 & 6	18547	18924	200	600	19147	19524	7.2	15000	30000	123.6	127.6	130.2*	6.5

Census Point No.	Location	CP lies on Route/ common for Routes	Total (Year Nov. 2018), PCU/Day	Projected Traffic for 1 year, PCU/day	Additional KSTPP trucks/ Day under worst case, Nos.	Additional proposed Traffic, PCU/day	Total resultant traffic in future, PCU/day	Total resultant traffic in future after 1 year, PCU/day	Width of road (m)	DSV#, PCU/day	Maximum capacity###, PCU/day	% utilised of DSV			
												Current in 2018	In future	Resultant future (after 1 year)	Increment
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)=(d)+(g)	(i)=(e)+(g)	(j)	(k)	(l)=(k)/0.5	(m)=w.r.t. (d)	(n)=w.r.t. (h)	(o)=w.r.t. (i)	(p)=(o)-(m)
	at LoS C									21000		88.3	91.2	93.0	4.7
CP-21	Near Police station, Chhaigaon Makhan village	5	13594	13870	200	600	14194	14470	7.1	15000	30000	90.6	94.6	96.5	5.8
CP-22	Near Borgaon Village	5	14106	14392	200	600	14706	14992	7	15000	30000	94.0	98.0	99.9	5.9
CP-23	Near Asir village	5	14924	15227	200	600	15524	15827	8.5	15000	30000	99.5	103.5	105.5	6.0
CP-26	Near Chhaigaon Makhan Village on Khandwa road	6	10230	10438	200	600	10830	11038	10	15000	30000	68.2	72.2	73.6	5.4

Note: All volumes are total of two directions,

Design Service Volume (DSV) in PCU/day as per Table 2, 3, & 5 of IRC : 64-1990 *DSV exceeded

Maximum capacity as per IRC 64-1990, section 6.1 = DSV/0.7, in PCU/Hour for Urban area

Maximum capacity as per IRC 64-1990, section 6.1 = DSV/0.5, in PCU/day for Rural area

At Level of Service C (LoS C), the DSV is considered as 40% more than the DSV at LoS B as per IRC 64-1990, section 6.1.

2.6 Summary and conclusion regarding increase in traffic

Analysis of traffic on roads through urban areas

It can be seen from **Table 10** that at CP-10, 11 & 16, the existing traffic is higher than the DSV during the peak hour in a 24 hour period, but lower than the maximum capacity utilisation. Detailed analysis of the hour-wise traffic volume for the 24 hour period was done and it has been found that traffic remains high during day time only during 9:00 AM to 5:00 PM. Keeping this in mind, movement of coal carrying trucks will be restricted in their movement to only 16 hours during 5:00 PM to 9:00 AM. Thus, the coal transportation will take place when the traffic is within DSV limits.

Analysis of traffic on roads through rural areas

In case of the roads passing through the rural areas, there are total 20 census point. At all the census points except CP-17, the road width will have sufficient capacity to support the existing and the additional proposed traffic at LoS-C (good condition for traffic stream). Amongst these, it can be seen that the road width at 17 Census Points location is sufficient for supporting the existing and the additional proposed traffic at Level of Service B (LoS-B) also which represents very good condition of traffic stream.

The current road width at CP- 17 is too narrow to support even the current traffic volume. However, this road is under widening to 5.5 m. After widening the road will have sufficient capacity to support the traffic at Los-B. This road will be needed for transportation of coal from Dhakalgaon railway siding. It may be noted that Dhakalgaon railway siding is under construction which is expected to be completed by March, 2019 while the widening of this road expected before March, 2019. Hence, this road has also been considered feasible for transportation of coal after widening.

During site visit, it has been observed that there is a sharp turn through the densely populated area at Barud village. Sometimes congestion occurs, therefore, this location will require manned supervision by NTPC whenever its tippers have movement on this road.

3.0 SATELLITE IMAGES FROM GOOGLE EARTH

Satellite images of the entire route for coal transportation from various railway siding to Khargone STPP have been prepared, using Google Earth. and are given in **Annexure 7**.

3.1 Village & Habitation Study

The villages lying within 100 m on both sides of the road, along the entire length of various routes were identified from the SOI and Census maps. The District, Tehsil, routes along which they are falling, distance from road and

population of the villages is given in **Table 11** and location of the villages on routes are shown in **Fig. 3**.

TABLE 11
LOCATION OF VILLAGES AND THEIR POPULATION

Sl. No.	Villages	Distance From Road, m	Tehsil	District	Population as Per Census 2011	Along Alternate Routes					
						1	2	3	4	5	6
1	Amba	0	Barwaha	Khargone	2228	√					
2	Roria (Rodiya)	0	Bikhangaon	Khargone	2021	√					
3	Umaria	0	Bhagwanpura	Khargone	539	√					
4	Kheri Buzurg	5	Kasrawad	Khargone	1572	√					
5	Selda	5	Barwaha	Khargone	973	√	√	√	√	√	√
6	Katora	0	Barwaha	Khargone	3468		√	√	√	√	√
7	Bargaon	0	Barwaha	Khargone	1342		√	√	√	√	√
8	Bhogaon Nipani	0	Barwaha	Khargone	1981		√	√	√	√	√
9	Dudgaon	0	Barwaha	Khargone	3450		√	√	√	√	√
10	Beria (Bediya)	5	Barwaha	Khargone	8019		√	√	√	√	√
11	Amarpura	5	Barwaha	Khargone	NA in Census 2011		√	√	√	√	√
12	Chitawad	5	Barwaha	Khargone	1977		√	√	√	√	√
13	Satajana	5	Barwaha	Khargone	1352		√	√	√	√	√
14	Barud (Badud)	0	Barwaha	Khargone	7275		√	√	√	√	√
15	Sanawad (MC)	0	Barwaha	Khargone	38740		√	√	√	√	√
16	Dhakaalgaon	5	Barwaha	Khargone	5103		√	√	√		
17	Junapani	5	Barwaha	Khargone	872			√	√		
18	Ghosli	5	Punasa	Khandwa	690			√	√		
19	Sulgaon	5	Punasa	Khandwa	4027			√	√		
20	Karoli	5	Punasa	Khandwa	1480			√	√		
21	Bakhargaon	5	Punasa	Khandwa	711			√	√		
22	Atud	0	Punasa	Khandwa	NA in Census 2011			√	√		
23	Dudgaon	0	Punasa	Khandwa	1516			√	√		
24	Khutla Khurd	0	Punasa	Khandwa	555			√	√		
25	Devlan	5	Bhikangaon	Khargone	2256			√	√		
26	Jalwan Buzurg	0	Punasa	Khandwa	2200			√	√		
27	Bhamori	0	Punasa	Khandwa	740			√	√		

Sl. No.	Villages	Distance From Road, m	Tehsil	District	Population as Per Census 2011	Along Alternate Routes					
						1	2	3	4	5	6
28	Kenud	0	Punasa	Khandwa	1045			√	√		
29	Mundi	0	Punasa	Khandwa	12889			√	√		
30	Dohad	5	Punasa	Khandwa	462				√		
31	Beed	0	Punasa	Khandwa	2982				√		
32	Bansa	5	Punasa	Khandwa	NA in Census 2011					√	√
33	Bhanbarar	5	Punasa	Khandwa	NA in Census 2011					√	√
34	Dhangaon	0	Khandwa	Khandwa	1122					√	√
35	Dhaurwa	0	Khandwa	Khandwa	NA in Census 2011					√	√
36	Kherda	10	Bhikangaon	Khargone	2610					√	√
37	Roshiya (Roshya)	5	Bhikangaon	Khargone	857					√	√
38	Deshgaon	5	Khandwa	Khandwa	4193					√	√
39	Chhaigaon Makhan	10	Khandwa	Khandwa	1231					√	√
40	Mokalgaon	10	pandhana	Khandwa	1464					√	
41	Dulhar	5	pandhana	Khandwa	3254					√	
42	Piplod Khurd	5	pandhana	Khandwa	4143					√	
43	Rustampur	0	pandhana	Khandwa	3610					√	
44	Balrampur	5	pandhana	Khandwa	1438					√	
45	Sultanpur	5	pandhana	Khandwa	2801					√	
46	Borgaon	5	Bhikangaon	Khargone	1319					√	
47	Dahinala	5	Nepanagar	Burhanpur	2179					√	
48	Hasanpura	5	Nepanagar	Burhanpur	2804					√	
49	Asir	5	Nepanagar	Burhanpur	NA in Census 2011					√	
50	Chandni	5	Nepanagar	Burhanpur	1094					√	
51	Nepanagar	0	Nepanagar	Burhanpur	29682					√	
52	Dondwara	10	Bhikangaon	Khargone	350						√
53	Chhaigaondevi	5	Khandwa	Khandwa	1676						√
54	Khandwa (MC)	5	Khandwa	Khandwa	200738						√
Total village along route						5	12	25	27	31	22

3.2 Plantation Study

As per the route map superimposed on the topo sheet (refer **Fig. 4** and **Table 12**), it can be seen that various reserved forests are falling within 100 m of the proposed routes. **Table 12** below is showing % of the route passing through forest area.

TABLE 12
PERCENTAGE OF ROUTE LENGTHS PASSING THROUGH FORESTS

Alternate Routes	Length of the route (km)	Length of the route passing through or adjoining or within 100 m of forest boundary (km)	% of the route passing through or adjoining or within 100 m of forest boundary
Route-1	22.6	1.6	7.1
Route-2	46.0	0.1	0.3
Route-3	97.4	2.7	2.7
Route-4	98.1	2.7	2.7
Route-5	145.2	31.8	21.9
Route-6	97.2	3.1	3.2

It may be noted that Asir and Musliya Reserved Forest are lying on left side along the Route-5, while coming from siding to plant. While Chandni and West Mandwa Reserved Forest are lying on right side along the Route-5, while coming from siding to plant. The portion of the route passing through Asir & Musliya reserved forest (8.6 km) is less than the portion of the route passing through Chandni and West Mandwa Reserved Forest (28.7 km). Hence for calculation in above table, length of Chandni and West Mandwa Reserved Forest has been considered since these two forest covers maximum portion of the route. Forest list along the routes is given in **Table 13**.

TABLE 13
VARIOUS RESERVED FORESTS FALLING WITHIN 100 M WIDTH ALONG THE TRANSPORTATION ROUTES

Sl. No.	Forest along Routes	Length of the route passing through or adjoining or within 100 m of forest boundary (km)	Along Routes					
			Route-1	Route-2	Route-3	Route-4	Route-5	Route-6
1.	Roria Reserved Forest	0.32	√					
2.	Umaria Reserved Forest	0.83	√					
3.	Kheri Reserved Forest	0.45	√					
4.	Jamunia Reserved Forest	0.13		√	√	√	√	√
5.	Karond Reserved Forest	0.57			√	√		
6.	Khurgaon Reserved Forest	1.96			√	√		
7.	Asir Reserved Forest	2.15					√	
8.	Chandni Reserved Forest	20.93					√	
9.	West Mandwa Reserved Forest	7.75					√	
10.	Musliya Reserved Forest	6.49					√	
11.	Baheriya Reserved Forest	0.99					√	√
12.	Bhojwa Reserved Forest	2.02					√	√
Total on route			3	2	3	3	7	3

During the field visit an inventory of the floral species found within 100 m on both sides of the road, along various routes was made. The different species of flora and the type of vegetation found along the routes have been listed in **Table 14**.

TABLE 14
LIST OF PLANT SPECIES ALONG ROUTES

Sl. No.	Local Name of floral species	Botanical Name	Family
1.	Khair	<i>Acacia catechu</i>	Mimosaceae
2.	Babul	<i>Acacia nilotica</i>	Mimosaceae
3.	Bel	<i>Aegle marmelos</i>	Rutaceae
4.	Kala Siras	<i>Albizzia lebbek Benth.</i>	Leguminosae
5.	Safed Siras	<i>Albizzia procera, Benth</i>	Fabaceae
6.	Kadamba	<i>Anthocephalus cadamba</i>	Rubiaceae
7.	Sitafal	<i>Annona squamosa</i>	Annonaceae
8.	Neem	<i>Azadirachta indica</i>	Meliaceae
9.	Semal	<i>Bombax ceiba</i>	Malvaceae
10.	Taad	<i>Borassus flabellifer</i>	Arecaceae
11.	Palas	<i>Butea monosperma</i>	Fabaceae
12.	Shishu	<i>Dalbergia sisoo</i>	Fabaceae
13.	Tendu	<i>Diospyras melanoxylon</i>	Ebenaceae
14.	Amla	<i>Emblica officinalis</i>	Phyllanthaceae
15.	Pipal	<i>Ficus religiosa L.</i>	Moraceae
16.	Kakai	<i>Flacourtia indica</i>	Salicaceae
17.	Bargad	<i>Ficus bengalensis</i>	Moraceae
18.	Oak	<i>Grevelea robusta</i>	Proteaceae
19.	Mahua	<i>Madhuca indica</i>	Sapotaceae
20.	Lendia	<i>Lagerstroemia parviflora</i>	Lythraceae
21.	Aam	<i>Magnifera indica</i>	Anacardiaceae
22.	Ashok	<i>Polyathia longifolia</i>	Annonaceae
23.	Karanj	<i>Pongamia pinnata</i>	Fabaceae
24.	Sagwan	<i>Tectona grandis</i>	Verbenaceae
25.	Imli	<i>Tamarindus indica</i>	Fabaceae
26.	Arjun	<i>Terminalia arjuna</i>	Combretaceae
27.	Aak	<i>Calotropis gigantea</i>	Asclepiadaceae
28.	Tulsi	<i>Ocimum sanctum L.</i>	Lamiaceae
29.	Ber	<i>Ziziphus xylopyra</i>	Rhamnaceae

4.0 COLLECTION OF ENVIRONMENTAL DATA

4.1 Ambient Air Quality

The ambient air quality monitoring along different road stretches was carried during survey period from 21th November to 22nd December, 2018. 24-hour average samples were collected from each station. These samples were analyzed in laboratory by adopting the methods specified in National Ambient Air Quality Standards. The following parameters were determined for each sample:

1. Respirable Particulate Matter (RPM or PM₁₀)
2. Fine particulate (PM_{2.5})
3. Sulphur dioxide (SO₂)
4. Nitrogen dioxide (NO₂)

The air sampling stations were established at 27 locations along the different routes (Route-1, 2, 3, 4, 5 and 6) to study the baseline ambient air quality. The locations and baseline ambient air quality of these sampling stations, is given in **Table 16** and shown in **Fig. 5**.

The concentration of various air quality parameters along the different routes has been summarised and given in **Table 15**.

TABLE 15
ROUTE WISE SUMMARY OF AMBIENT AIR QUALITY

Route	Air Quality Parameters, $\mu\text{g}/\text{m}^3$							
	PM ₁₀		PM _{2.5}		SO ₂		NO ₂	
	Min	Max	Min	Max	Min	Max	Min	Max
Route-1	83.5		47.0		9.7		13.8	
Route-2	56.8	85.0	32.5	48.3	7.4	12.1	10.2	16.2
Route-3	65.4	85.0	37.5	48.3	7.4	13.3	10.8	18.6
Route-4	65.4	85.0	37.5	48.3	7.4	12.1	10.8	16.2
Route-5	61.2	85	33.7	48.3	7	12.1	10.8	17.4
Route-6	68.3	85.9	38.7	49.9	7	12.5	10.8	16.8

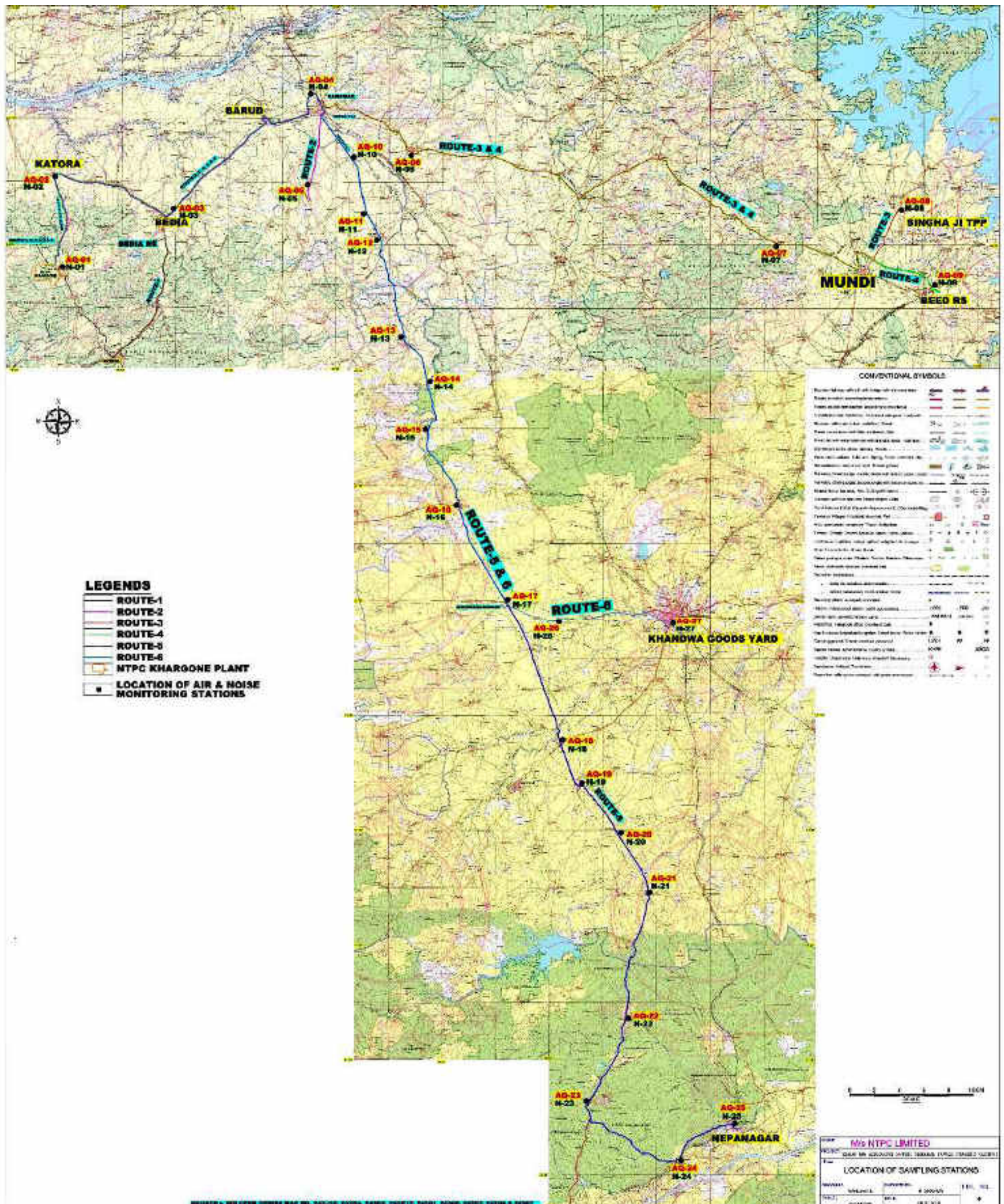
The perusal of above table, it can be seen that the range of PM₁₀ in the study area was found between 61.2 to 85.9 $\mu\text{g}/\text{m}^3$, PM_{2.5} was found between 32.5 to 49.9 $\mu\text{g}/\text{m}^3$, SO₂ from 7.0 to 13.3 $\mu\text{g}/\text{m}^3$ and NO₂ from 10.2 to 18.6 $\mu\text{g}/\text{m}^3$.

All the values are on the lower side at all the locations. The concentrations of SO₂ and NO₂ are found considerably low compared to 80 $\mu\text{g}/\text{m}^3$ as per NAAQS permissible limit for residential, rural and other areas. The concentrations of PM₁₀ and PM_{2.5} are also within the limits of 100 $\mu\text{g}/\text{m}^3$ as per the National Ambient Air Quality Standard, at all locations.

TABLE 16
AMBIENT AIR QUALITY AT MONITORING STATIONS ALONG ROUTES

Station No.	Location	Distance (m) from road edge	Air Quality Parameters, $\mu\text{g}/\text{m}^3$				Along Routes					
			PM10	PM2.5	SO ₂	NO ₂	1	2	3	4	5	6
AQ-01	Selda village	50	83.5	47	9.7	13.8	√	√	√	√	√	√
AQ-02	Katora village	20	78.4	43.7	7.4	12.6		√	√	√	√	√
AQ-03	Bediya Village	20	77.5	43.3	8.2	13.2		√	√	√	√	√
AQ-04	Sanawad Near Anaj Mandi	25	85	48.3	12.1	16.2		√	√	√	√	√
AQ-05	Dhakaigaon village	50	56.8	32.5	7.4	10.2		√				
AQ-06	Sulgaon village	20	65.4	37.5	7.4	10.8			√	√		
AQ-07	Bhamori village	25	72.2	41.6	9	16.2			√	√		
AQ-08	Nr. Main gate Singhaji Plant	40	80.6	46.2	13.3	18.6			√			
AQ-09	Near Beed Railway siding	50	68.5	39.1	9.8	12.6				√		
AQ-10	Banswa village	20	73.9	47.9	7.8	11.4					√	√
AQ-11	Bhanbarar village	30	72.9	40.8	7.8	11.4					√	√
AQ-12	Dhangaon village	20	68.3	38.7	7.8	12.6					√	√
AQ-13	Dhaurwa village	30	71.2	41.2	8.2	12					√	√
AQ-14	Kherda village	20	72	40.4	7.4	11.4					√	√
AQ-15	Roshiya village	60	70	39.5	7	10.8					√	√
AQ-16	Deshgaon village	80	73.9	41.2	10.9	14.4					√	√
AQ-17	Chhaigaon Makhani village	30	82.9	47.4	8.6	12					√	√
AQ-18	Dulhar village	30	72.1	42	9	12					√	
AQ-19	Rustampur Village	40	69.6	40	8.6	13.2					√	
AQ-20	Sultanpur village	60	73.8	42.4	9	13.2					√	
AQ-21	Borgaon Buzurg	20	69.6	39.5	9	13.8					√	
AQ-22	Dahinala village	90	68	39.5	7.8	12					√	
AQ-23	Asir village	80	62	33.7	7	11.4					√	
AQ-24	Chandni village	20	61.2	35.4	10.1	13.2					√	
AQ-25	Nepanagar Township	30	79.2	44.1	8.6	17.4					√	
AQ-26	Dondwara village	40	69.7	39.9	8.2	11.4						√
AQ-27	Khandwa	20	85.9	49.9	12.5	16.8						√
	Minimum		56.8	32.5	7	10.2						
	Maximum		85.9	49.9	13.3	18.6						
	Permissible Limit, NAAQS 2009		100	60	80	80						

FIG. 5: LOCATION OF AIR AND NOISE SAMPLING STATIONS



4.2 Noise Environment

Ambient noise monitoring was also carried out along with monitoring of the ambient air quality along all the proposed routes to ascertain the present noise level. The location of monitoring station and respective noise level observed is given in **Table 17** and shown in **Fig. 5**.

It can be seen from **Table 17** that the baseline noise levels, are within the permissible limit of the National Ambient Air Quality Standards with respect to noise during day time and night time for residential, commercial and industrial land uses, as applicable.

TABLE 17
NOISE LEVELS AT SAMPLING STATIONS ALONG ROUTES

Station No.	Location	Distance (m) from road edge	Area	Observed noise levels, dBA		Permissible levels, dBA		Along Routes					
				Day	Night	Day	Night	1	2	3	4	5	6
N-01	Selda village	50	Residential	52.1	39.98	55	45	√	√	√	√	√	√
N-02	Katora village	20	Residential	50.87	39.39	55	45		√	√	√	√	√
N-03	Bediy a Village	20	Residential	52.52	42.89	55	45		√	√	√	√	√
N-04	Sanaw ad Near Anaj Mandi	25	Residential	50.18	44.32	55	45		√	√	√	√	√
N-05	Dhakalgaon village	50	Residential	52.63	42.73	55	45		√				
N-06	Sulgaon village	20	Residential	49.61	37.77	55	45			√	√		
N-07	Bhamori village	25	Residential	46.25	36.78	55	45			√	√		
N-08	Nr. Main gate Singhaji Plant	40	Residential	58.37	47.28	75	70			√			
N-09	Near Beed Railway siding	50	Residential	46.14	38.42	55	45				√		
N-10	Bansw a village	20	Residential	52.87	41.29	55	45					√	√
N-11	Bhanbarar village	30	Residential	53.84	42.96	55	45					√	√
N-12	Dhangaon village	20	Residential	52.04	42.21	55	45					√	√
N-13	Dhaurw a village	30	Residential	49.54	41.78	55	45					√	√
N-14	Kherda village	20	Residential	53.17	43.17	55	45					√	√
N-15	Roshiy a village	60	Residential	46.25	39.92	55	45					√	√
N-16	Deshgaon village	80	Residential	52.09	42.95	55	45					√	√
N-17	Chhaigaon Makhan village	30	Residential	53	42.3	55	45					√	√
N-18	Dulhar village	30	Residential	46.22	39.3	55	45					√	
N-19	Rustampur Village	40	Residential	46.23	38.56	55	45					√	
N-20	Sultanpur village	60	Residential	48	39.82	55	45					√	
N-21	Borgaon Buzurg	20	Residential	46.33	36.95	55	45					√	
N-22	Dahinala village	90	Residential	42.2	37.59	55	45					√	
N-23	Asir village	80	Residential	51.21	41	55	45					√	
N-24	Chandni village	20	Residential	44.57	37.85	55	45					√	
N-25	Nepanagar Township	30	Residential	51.42	41.2	55	45					√	
N-26	Dondw ara village	40	Residential	48.08	37.35	55	45						√
N-27	Khandw a	20	Commercial	60.35	54.33	65	55						√

4.3 Opinion survey, Health & Accident data

Opinion Survey:

An opinion survey has been conducted in the villages located within a distance of 100 m on both sides of the route from various Sidings to Khargone STPP. The survey has been conducted to understand the peoples perception about their current comfort levels in their residences, with respect to disturbances due to traffic.

A questionnaire was filled by 46 people living in various villages along the different routes envisaged for coal transportation, mentioning the problems they faced and may face due to transportation along the road. Out of the total people involved in the survey 89.1% are satisfied with their present location, while 4.3% of them are not happy with their location due to noise, dust and vibration of the vehicles, while remaining 6.6% did not comment on this. It has been observed that the people of the area are well aware of the current scenario with respect to traffic and its impacts. They also have clear views on what are the likely impacts of increase in traffic and they have ideas on how to resolve them.

Health Status:

Baseline data regarding health status of the people living in the areas were collected from CHC Mundi, Nepa Limited hospital Neapanagar, CHC Neapanagar, Govt. PHC Punasha, CHC Chhaigaon Makhana and Pandit Din Dayal Upadhyaya Civil Hospital Sanawad. After perusal of the data it has been observed that hypertension, asthma/ chronic respiratory diseases, acute respiratory infections, fever, diarrhoea/ dysentery, diabetes, tuberculosis etc are prevalent in the area.

Accident data:

Data regarding road accidents were collected from various police stations along the various routes. They have provided the data of total number of accidents. The same has been summarized below:

Sl. No.	Police station	Period	People injured	People died
1	Bediya Police Station	17 Feb, 2017 to 31 Oct, 2018	64	23
2	Dhangaon Police station	16 Feb, 2018 to 26 Nov.,2018	48	10
3	Nimbola Police station	Year 2015	-	7
		Year 2016	84	9
		Year 2017	100	16
		Year 2018 till November	141	17
4	Police station Padhana	Year 2017	27	11

Sl. No.	Police station	Period	People injured	People died
5	Mundi police station	Year 2017	27	2
		Year 2018	18	2
6	Narmdanagar Police station	Year 2017	8	4
		Year 2018 till November	12	6

The above table shows the present baseline scenario with respect to accidents.

5.0 IMPACT DUE TO TRAFFIC

The impact of increase in traffic on various parameters of the environment is discussed in subsequent paragraphs.

5.1 Ambient Air Quality

The plying of trucks from any of the siding to Khargone STPP will emit particulates, HCs, SO₂, NO₂ and CO. Monitoring of existing air quality was carried out at 27 locations along the routes during the study period as given in **Table 16** above. Air quality prediction modelling is an exercise being carried out to assess the incremental component of the pollutants due to additional coal trucks to be added to the present ambient air quality.

Dispersion modelling has been done to determine the incremental ground level concentration of pollutants due to plying of trucks under worst case scenarios. In order to predict the possible impacts of vehicular transportation, CALINE 4 model has been used. The assumptions for modelling for a 20 T Bharat Stage-IV compliant coal carrying tipper moving at 40 kmph for 16-24 hours/day is given in **Table 18**.

TABLE 18
CALCULATION OF EMISSION FROM EXHAUSTS AND AIRBORNE
ROAD DUST DUE TO TYRES OF TIPPING TRUCKS

	Units	NOx	PM	SO ₂
Emission permitted*		3.5	0.02	
Resultant KWH	KWH	135.28	135.28	135.28
Emission from one truck	g/truck/hour	473.48	2.7056	67.284
Emission from 1 truck/km	g/km	11.84	0.06764	1.6821
Emission from 1 truck/mile	g/mile	18.9392	0.10822	2.6914

Note: Actual emissions will be much less since above calculation are for maximum permitted value

**Source: Indian Emission Regulation for Bharat Stage-IV (BS-IV) w.e.f. 01.04.2010.*

(Emission standards for new heavy-duty engines—applicable as per Bharat Stage IV (applicable nationwide since April 2017)*

The fugitive dust airborne due to movement of wheels on the road has been calculated in subsequent paragraphs and added to the exhaust emissions for modelling. The modelling was carried out for the entire route by dividing it into 35 sections. Thereafter, the most critical section was identified where incremental pollutant levels were found to be highest at 20 m from the centre of the road. This section was Section-7 and the receptor number is 86. The detailed report of Dispersion modelling, for Section 18, considering worst case scenario is given in **Annexure 6**. The highest resultant values obtained after air quality prediction modeling for pollutants, arising due to emissions from trucks under worst case is given in **Table 19**.

TABLE 19
RESULTANT AIR QUALITY AFTER AIR QUALITY
PREDICTION MODELLING FOR WORST CASE SCENARIOS

Parameters	Highest Value observed in study area as per monitoring ($\mu\text{g}/\text{m}^3$)	Highest Incremental Values from dispersion modelling ($\mu\text{g}/\text{m}^3$)	Resultant ($\mu\text{g}/\text{m}^3$)	NAAQS - 2009 ($\mu\text{g}/\text{m}^3$)
1	2	3	4 = (2+3)	5
PM ₁₀	85.9	0.614	86.514	100
PM _{2.5}	49.9	0.172	50.072	60
SO ₂	13.3	1.98	15.28	80
NO ₂	18.6	13.07	31.67	80

It can be seen from **Table 19** that the plying of additional trucks would lead to an increase in the amount of air pollutant emissions. The highest resultant air quality, after addition of the highest incremental values due to plying of additional coal carrying trucks will be 86.514 $\mu\text{g}/\text{m}^3$ for PM₁₀, 50.072 $\mu\text{g}/\text{m}^3$ for PM_{2.5}, 15.28 $\mu\text{g}/\text{m}^3$ for SO₂ and 31.67 $\mu\text{g}/\text{m}^3$ for NO₂. It has been found that the concentration of all parameters would remain well within the prescribed limits at all places.

The particulate matter increment values in the above table pertain to both the emission from the exhausts of the vehicles as well as an additional component of particulate matter in the form of dust becoming airborne from roads due to wheel movement. The dust on roads comes from various sources such as settlement of fugitive dust, spillage from vehicles, peeling of mud stuck on wheels, weathering of road itself, dust storms, etc.

The movement of wheels disturb the area under the wheels and creates disturbances in the air which are localised, temporary and reversible. The dust becomes airborne and resettles according to particle size. As per various research papers, silt content of this dust is of consequence in addition to the speed/ weight of the vehicle to determine magnitude of airborne dust.

As per AP-42, 5th Edition of US EPA, Section 13.2.1.3, the quantity of particulate emissions from re-suspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

$$E = [k (sL)^{0.91} \times (W)^{1.02}] \times (1-P/4N)$$

where: E = particulate emission factor (having units matching the units of k),

k = particle size multiplier for particle size range and units of interest, which will be 0.62 g/VKT for PM₁₀ and 0.15 g/VKT for PM_{2.5} as per Table 13.2.1-1 of AP-42, US EPA.

sL = road surface silt loading (grams per square meter) (g/m²). Silt content has been taken as 0.03 g/m² since the average silt content was found 0.0203 g/m² from 16 sample collected from various route which is lower than the minimum recommended value i.e 0.03 g/m² as per AP42 Table 13.2.1-2.

W = average weight (tons) of the vehicles travelling the road, which is 20 (average of loaded and empty trucks of 20 Tonne capacity) for the traffic.

P = Total wet days with at least 0.254 mm (0.01 in) of precipitation during the averaging period which is 42 days at IMD Khandwa (avg. from 1981-2010 mentioned in Climatological Normal 1981-2010), and

N = Number of days in the averaging period which is 365 days

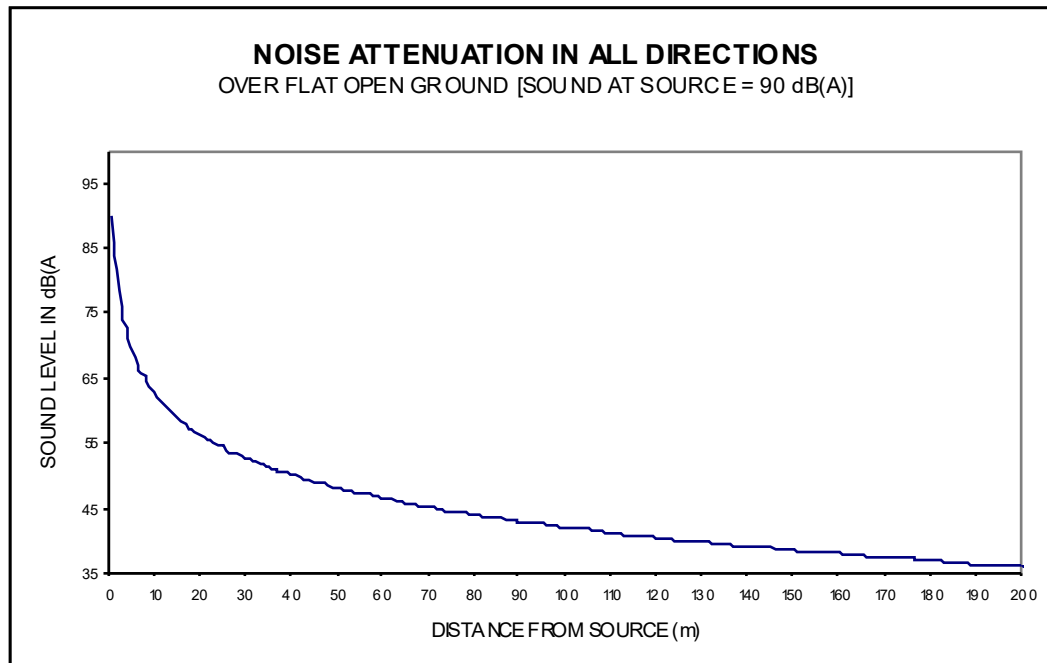
Thus,

$$\begin{aligned} & \text{PM}_{10} \\ E &= 0.62 (0.03)^{0.91} \times (20)^{1.02} \times (1 - 42/(4 \times 365)) \\ &= 0.5259 \text{ g/VKT} \end{aligned}$$

$$\begin{aligned} & \text{PM}_{2.5} \\ E &= 0.15 (0.03)^{0.91} \times (18)^{1.02} \times (1 - 42/(4 \times 365)) \\ &= 0.1273 \text{ g/VKT} \end{aligned}$$

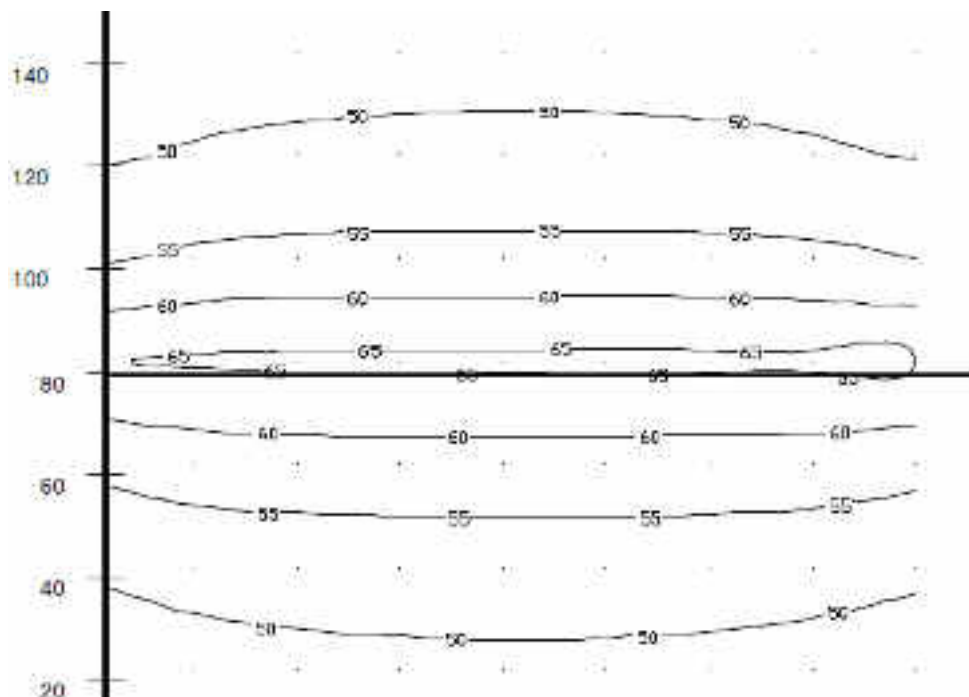
5.2 Ambient Noise

The maximum number of trucks anticipated will be 200 trucks/day under worst case i.e. an average of approximately 8-13 trucks per hour (for 24hrs & 16 hrs operation) on common section. The sound level from the movement of tippers passing on the road is approximately 90 dB(A). This will be a short term increase, prevailing only at the time of passage of truck. The overall Leq for an hour or day will be lower. As the distance increases from the line of truck movement, the anticipated Leqs will be as follows:



At a distance of 7 m, the Leq is anticipated to be approximately 65 dB(A), falling within the limits for commercial areas, which is the usual case within along roads.

Prediction modelling for traffic noise which will arise due to movement of trucks, has also been done through FHWA TNM model. FHWA TNM model is a new state-of-the art computerized model used for predicting noise impacts in the vicinity of highways. Modelling has been done by considering maximum 13 trucks movement (to and fro) hourly on a straight road stretch of about 1 km without any barrier, houses or trees adjoining road. The noise contour predicted through FHWA TNM is presented below:



5.3 Human Health

It can be seen from **Table 19** that the maximum resultant air quality values after addition of incremental ground level concentration, due to plying of additional tippers for PM_{10} , $PM_{2.5}$, SO_2 and NO_2 under worst case will be $86.514 \mu g/m^3$, $50.072 \mu g/m^3$, $15.28 \mu g/m^3$ and $31.67 \mu g/m^3$, respectively.

The levels after increment will be well within the prescribed limit as per NAAQS 2009.

The impact of various pollutants is discussed below:

5.3.1 Particulates

Impact on Health: PM_{10} and $PM_{2.5}$ include inhalable particles that are small enough to penetrate the thoracic region of the respiratory system. The health effects of inhalable PM are well documented in 'Health effects of particulate matter, Policy implications for countries in eastern Europe, Caucasus and Central Asia by World Health Organisation, Regional Office for Europe, 2013'. They are due to exposure over both the short term (hours, days) and long term (months, years) and include:

- i. respiratory and cardiovascular morbidity, such as aggravation of asthma, respiratory symptoms and an increase in hospital admissions;
- ii. mortality from cardiovascular and respiratory diseases and from lung cancer.

Threshold concentrations for humans : As described in detail in Chapter 7.3, Particulate Matter, Air Quality Guidelines, Second Edition, World Health Organisation Regional Office for Europe, Copenhagen, Denmark, 2000, at low levels of (short-term) exposure (defined as $0-100 \mu g/m^3$ for PM_{10}), the exposure response curve fits a straight line reasonably well, there are indications from studies conducted in the former German Democratic Republic and in China that at higher levels of exposure (several hundreds of $\mu g/m^3$ PM_{10}), the curve is shallower for at least effects on mortality than at low levels of exposure.

The relative risk increase between 1.0074-1.0356 for daily mortality, respiratory hospital admissions, reporting of broncho-dilator use, cough and lower respiratory symptoms, and changes in peak expiratory flow has been associated with a $10 \mu g/m^3$ increase in PM_{10} or $PM_{2.5}$ with respect to the concentrations actually measured.

In this case, the incremental particulate emissions for worst case will be $0.614 \mu g/m^3$ for PM_{10} and $0.172 \mu g/m^3$ for $PM_{2.5}$ at a distance of 20 m from the road centre. The incremental values are within the significant figures of $10 \mu g/m^3$.

5.3.2 Sulphur dioxides

Impact on Health: Sulphur dioxide irritates the skin and mucous membranes of the eyes, nose, throat, and lungs. High concentrations of SO₂ can cause inflammation and irritation of the respiratory system, particularly during heavy physical activity.

The resulting symptoms may include pain when taking a deep breath, coughing, throat irritation, and breathing difficulties. High concentrations of SO₂ can affect lung function, worsen asthma attacks, and aggravate existing heart disease in sensitive groups.

This gas can also react with other chemicals in the air and convert to a small particle that can lodge in the lungs and cause similar health effects.

Threshold concentrations for humans: As described in detail in Chapter 7.4, Sulphur dioxide, Air Quality Guidelines, Second Edition, World Health Organisation Regional Office for Europe, Copenhagen, Denmark, 2000, the health risk evaluation for short term exposures (less than 24 hours) has been done. Only small changes, not regarded as of clinical significance, were seen at 572 µg/m³ (0.2 ppm); reductions representing about 10% of baseline, Forced Expiratory Volume (FEV1) occurred at about 1144 µg/m³ (0.4 ppm); and reductions of about 15% occurred at about 1716 µg/m³ (0.6 ppm).

The response was not greatly influenced by the severity of asthma. These findings are consistent with those reported from other exposure studies. In one early series, however, a small change in airway resistance was reported in two of the asthmatic patients at 286 µg/m³ (0.1 ppm). For long term exposure, the lowest-observed-adverse-effect level of sulfur dioxide was judged to be 100 µg/m³ (0.035 ppm) annual average, together with particulate matter.

In this case, the maximum resultant ambient air quality after addition of incremental emissions will be 15.28 µg/m³ which is much lower than the value which impact human health.

5.3.3 Nitrogen oxides

Impact on Health: Human health concerns include effects on breathing and the respiratory system, damage to lung tissue, and premature death. Small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and aggravate existing heart disease.

Threshold concentrations for humans : As described in detail in Chapter 7.1, Nitrogen dioxide, Air Quality Guidelines, Second Edition, World Health Organisation Regional Office for Europe, Copenhagen, Denmark, 2000, a significant amount of research has been directed at evaluating the effect of nitrogen dioxide on pulmonary function and airway responsiveness to

pharmacological, physical (e.g. cold air) or natural (i.e. allergens) broncho-constrictors. Generally, concentrations higher than $1880 \mu\text{g}/\text{m}^3$ (1.0 ppm) are required to increase responsiveness to broncho-constrictors and to induce changes in pulmonary function in healthy adults.

Analysis of lung lavage from healthy humans indicated that high levels ($5640\text{--}7520 \mu\text{g}/\text{m}^3$; 3–4 ppm) reduce the activity of alpha-1-protease inhibitor, a protein that acts to protect the lung from the proteolytic enzyme elastase by inhibiting connective tissue damage. However, $2820 \mu\text{g}/\text{m}^3$ (1.5 ppm) had no such effect.

Such concentrations as mentioned above, almost never occur in ambient air, thus, the resultant ambient air quality values of nitrogen oxide (maximum $31.67 \mu\text{g}/\text{m}^3$) is not expected to have any impact on the healthy human beings. On the basis of these human clinical data, WHO has given a 1-hour guideline of $200 \mu\text{g}/\text{m}^3$. At double this recommended guideline ($400 \mu\text{g}/\text{m}^3$), there is evidence to suggest possible small effects in the pulmonary function of asthmatics. Should the asthmatic be exposed either simultaneously or sequentially to nitrogen dioxide and an aeroallergen, the risk of an exaggerated response to the allergen is increased. At 50% of the suggested guideline ($100 \mu\text{g}/\text{m}^3$, 50 ppb), there have been no studies of acute response in 1 hour.

5.4 Ecology

Dust may affect photosynthesis, respiration, transpiration and allow the penetration of phytotoxic gaseous pollutants. Dust from highways and roads are deposited on leaves of road side vegetation and affect by inducing changes in pH, relative water content and species diversity. However, this will be reversible process as the dust on leaves will be washed out during rainy season and in case of high wind. Vegetation act as natural filters by depositing dust particles on their leaf surface, susceptible and highly exposed part of a plant and, thus, makes an important contribution in the improvement of air quality. Leaves act as pollution receptors and decrease dust load of the air.

6.0 OBSERVATIONS

From the various surveys, following observations were made on the six routes:

DETAILS OF ROUTE-1: BEDIYA SIDING TO KHARGONE STPP

Total length, km	22.6			
No. of Villages along the route	5			
Road passes through urban area, approx. km	0			
Road passes through rural area, approx. km	22.6			
Black topped road, approx. km	22.3			
Concrete road, approx. km	0.3			
Length of the route passing through or adjoining or within 100 m of forest boundary, approx. km	1.6			
Width wise classification	Single Lane (<5.5 m)	Inter-mediate (5.5 m - 6.9 m)	Two Lane (7 m - 9.9 m)	Multi-lane (>=10 m)
Before widening of 1.2 km of single lane road, km	1.2	8.0	13.4	0.0
After widening	0	9.2	13.4	0.0

EXISTING AND RESULTANT TRAFFIC INTENSITY

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-03	Near Kheri Buzurg	Rural	6	6000	12000	2747	200	600	3403	45.8	56.7
CP-04	Near Roriya village	Rural	7	15000	30000	2057	200	600	2699	13.7	18.0
CP-05	Near Bagda Buzurg (Rodia to Bedia road)	Rural	7.1	15000	30000	4381	200	600	5070	29.2	33.8

DETAILS OF ROUTE-2: DAKHALGAON SIDING TO KHARGONE STPP

Total length, km	46.0			
No. of Villages along the route	12			
Road passes through urban area, approx. km	5.0			
Road passes through rural area, approx. km	41.0			
Black topped road, approx. km	42.6			
Concrete road, approx. km	3.4			
Length of the route passing through or adjoining or within 100 m of forest boundary, approx. km	0.1			
Width wise classification	Single Lane (<5.5 m)	Inter-mediate (5.5 m - 6.9 m)	Two Lane (7 m - 9.9 m)	Multi-lane (≥10 m)
Before widening of patch RW-24 to RW-34, km	5.4	3.9	36.7	0.0
After Widening	0	9.3	36.7	0.0

EXISTING AND RESULTANT TRAFFIC INTENSITY

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-01	Near Katora village (Katora to Plant road)	Rural	7	15000	30000	6158	200	600	6883	41.1	45.9
CP-02	Near Katora village (Katora to Beriya road)	Rural	7	15000	30000	4709	200	600	5405	31.4	36.0
CP-06	Near Beriya village	Rural	7	15000	30000	5270	200	600	5977	35.1	39.8
CP-07	Near Issar pump, Barud	Rural	7	15000	30000	5926	200	600	6646	39.5	44.3
CP-08	Near Barud village	Rural	8.6	15000	30000	8584	200	600	9358	57.2	62.4
CP-09	Sanaw ad by-pass - During peak - 7:00-8:00 AM	Urban	7	1500	2142.9	442	13	39	490	29.5	32.7

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-10	Near Indian Oil Pump, Sanaw ad - During peak - 12:00-1:00 PM	Urban	7	1500	2142.9	2920	13	39	3018	194.7	201.2*
CP-16	Near River Bridge at Sanaw ad - During peak - 3:00-4:00 PM	Urban	7.5	1500	2142.9	1970	13	39	2049	131.3	136.6*
CP-16	Near River Bridge at Sanaw ad - at LoS B	Rural	7.5	15000	30000	17399	200	600	17999	116.0	122.3*
	at LoS C			21000						82.9	87.4
CP-17	Near Dhakalgaon village -Before road widening	Rural	3.1	2000	4000	4647	200	600	5247	232.4	267.1*
	After Widening		5.5	6000	12000					77.5	89.0

Note: *DSV exceeds during day between 9:00 AM to 5:00 PM only. During this time, traffic movement through Urban road is not proposed.

DETAILS OF ROUTE-3: SINGHAJI PLANT SIDING TO KHARGONE STPP

Total length, km	97.4			
No. of Villages along the route	25			
Road passes through urban area, approx. km	14			
Road passes through rural area, approx. km	83.4			
Black topped road, approx. km	91.1			
Concrete road, approx. km	6.3			
Length of the route passing through or adjoining or within 100 m of forest boundary, approx. km	2.7			
Width wise classification	Single Lane (<5.5 m)	Inter-mediate (5.5 m - 6.9 m)	Two Lane (7 m - 9.9 m)	Multi-lane (≥10 m)
km	0.0	25.2	68.8	3.3

EXISTING AND RESULTANT TRAFFIC INTENSITY

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity###, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-01	Near Katora village (Katora to Plant road)	Rural	7	15000	30000	6158	200	600	6883	41.1	45.9
CP-02	Near Katora village (Katora to Beriya road)	Rural	7	15000	30000	4709	200	600	5405	31.4	36.0
CP-06	Near Beriya village	Rural	7	15000	30000	5270	200	600	5977	35.1	39.8
CP-07	Near Issar pump, Barud	Rural	7	15000	30000	5926	200	600	6646	39.5	44.3
CP-08	Near Barud village	Rural	8.6	15000	30000	8584	200	600	9358	57.2	62.4
CP-09	Sanaw ad by-pass - During peak - 7:00-8:00 AM	Urban	7	1500	2142.9	442	13	39	490	29.5	32.7

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-10	Near Indian Oil Pump, Sanaw ad - During peak - 12:00-1:00 PM	Urban	7	1500	2142.9	2920	13	39	3018	194.7	201.2*
CP-11	Near Railw ay crossing, Sanaw ad - During peak - 4:00-5:00 PM		7.6	1500	2142.9	1846	13	39	1922	123.1	128.1*
CP-12	Near Dhauli Mohalla, Sanaw ad - During peak - 2:00-3:00 AM		7.2	1500	2142.9	845	13	39	901	56.3	60.1
CP-13	Near Sulgaon Village		7.2	15000	30000	3932	200	600	4612	26.2	30.7
CP-14	Near Mundi, Singhaji Plant road		8	15000	30000	3699	200	600	4374	24.7	29.2
CP-15	Near Devlan village		5.6	6000	12000	3125	200	600	3788	52.1	63.1

Note: *DSV exceeds during day between 9:00 AM to 5:00 PM only. During this time, traffic movement through Urban road is not proposed.

DETAILS OF ROUTE-4: BEED RAILWAY SIDING TO KHARGONE STPP

Total length, km	98.1			
No. of Villages along the route	27			
Road passes through urban area, approx. km	13.5			
Road passes through rural area, approx. km	84.6			
Black topped road, approx. km	91.9			
Concrete road, approx. km	5.8			
WBM type, km	0.4			
Length of the route passing through or adjoining or within 100 m of forest boundary, approx. km	2.7			
Width wise classification	Single Lane (<5.5 m)	Inter-mediate (5.5 m - 6.9 m)	Two Lane (7 m - 9.9 m)	Multi-lane (>=10 m)
Before strengthening and widening of 0.1 km of single lane patch, km	0.1*	26.2	68.5	3.3
*strengthening and widening, Km	0	26.3	68.5	3.3

EXISTING AND RESULTANT TRAFFIC INTENSITY

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-01	Near Katora village (Katora to Plant road)	Rural	7	15000	30000	6158	200	600	6883	41.1	45.9
CP-02	Near Katora village (Katora to Beriya road)	Rural	7	15000	30000	4709	200	600	5405	31.4	36.0
CP-06	Near Beriya village	Rural	7	15000	30000	5270	200	600	5977	35.1	39.8
CP-07	Near Issar pump, Barud	Rural	7	15000	30000	5926	200	600	6646	39.5	44.3
CP-08	Near Barud village	Rural	8.6	15000	30000	8584	200	600	9358	57.2	62.4

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-09	Sanaw ad by-pass - During peak - 7:00-8:00 AM	Urban	7	1500	2142.9	442	13	39	490	29.5	32.7
CP-10	Near Indian Oil Pump, Sanaw ad - During peak - 12:00-1:00 PM	Urban	7	1500	2142.9	2920	13	39	3018	194.7	201.2*
CP-11	Near Railw ay crossing, Sanaw ad - During peak - 4:00-5:00 PM		7.6	1500	2142.9	1846	13	39	1922	123.1	128.1*
CP-12	Near Dhauli Mohalla, Sanaw ad - During peak - 2:00-3:00 AM		7.2	1500	2142.9	845	13	39	901	56.3	60.1
CP-13	Near Sulgaon Village		7.2	15000	30000	3932	200	600	4612	26.2	30.7
CP-15	Near Devlan village		5.6	6000	12000	3125	200	600	3788	52.1	63.1

Note: *DSV exceeds during day between 9:00 AM to 5:00 PM only. During this time, traffic movement through Urban road is not proposed.

DETAILS OF ROUTE-5: NEPA LTD.'S RAILWAY SIDING TO KHARGONE STPP

Total length, km	145.2			
No. of Villages along the route	31			
Road passes through urban area, approx. km	6			
Road passes through rural area, approx. km	139.2			
Black topped road, approx. km	142.1			
Concrete road, approx. km	3.2			
Length of the route passing through or adjoining or within 100 m of forest boundary, approx. km	31.8			
Width wise classification	Single Lane (<5.5 m)	Inter-mediate (5.5 m - 6.9 m)	Two Lane (7 m - 9.9 m)	Multi-lane (>=10 m)
Before widening of patch RW-131 to RW-132 & RW-133 to RW-134, km	3.6	29.4	112.0	0.2
After Widening, km	3.1	29.9	112.0	0.2

EXISTING AND RESULTANT TRAFFIC INTENSITY

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-01	Near Katora village (Katora to Plant road)	Rural	7	15000	30000	6158	200	600	6883	41.1	45.9
CP-02	Near Katora village (Katora to Beriya road)	Rural	7	15000	30000	4709	200	600	5405	31.4	36.0
CP-06	Near Beriya village	Rural	7	15000	30000	5270	200	600	5977	35.1	39.8
CP-07	Near Issar pump, Barud	Rural	7	15000	30000	5926	200	600	6646	39.5	44.3
CP-08	Near Barud village	Rural	8.6	15000	30000	8584	200	600	9358	57.2	62.4
CP-09	Sanaw ad by-pass - During peak - 7:00-8:00 AM	Urban	7	1500	2142.9	442	13	39	490	29.5	32.7
CP-10	Near Indian Oil Pump, Sanaw ad - During peak - 12:00-1:00 PM	Urban	7	1500	2142.9	2920	13	39	3018	194.7	201.2*

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-16	Near River Bridge at Sanaw ad - During peak - 3:00-4:00 PM	Urban	7.5	1500	2142.9	1970	13	39	2049	131.3	136.6*
CP-18	Near Dhangaon Village - at LoS B	Rural	7.3	15000	30000	14599	200	600	15495	97.3	103.3*
	at LoS C			21000						69.5	73.8
CP-19	Near Deshgaon Village	Rural	7.8	15000	30000	12073	200	600	12918	80.5	86.1
CP-20	Near Jain Dhaba, Chhaigaon Makhan Village - at LoS B	Rural	7.2	15000	30000	18547	200	600	19524	123.6	130.2*
	at LoS C			21000						88.3	93.0
CP-21	Near Police station, Chhaigaon Makhan village	Rural	7.1	15000	30000	13594	200	600	14470	90.6	96.5
CP-22	Near Borgaon Village	Rural	7	15000	30000	14106	200	600	14992	94.0	99.9
CP-23	Near Asir village	Rural	8.5	15000	30000	14924	200	600	15827	99.5	105.5
CP-24	Nepanagar (on SH27 to Nepanagar road) - During peak- 1:00-2:00 PM	Urban	5.1	1500	2142.9	203	13	39	246	13.5	16.4
CP-25	Near Bus Stand, Nepanagar - During peak- 5:00-6:00 AM	Urban	6	1500	2142.9	344	13	39	390	22.9	26.0

Note: *DSV exceeds during day between 9:00 AM to 5:00 PM only. During this time, traffic movement through Urban road is not proposed.

DETAILS OF ROUTE-6: KHANDWA GOODS YARD TO KHARGONE STPP

Total length, km	97.2			
No. of Villages along the route	22			
Road passes through urban area, approx. km	10			
Road passes through rural area, approx. km	87.2			
Black topped road, approx. km	95.2			
Concrete road, approx. km	2.0			
Length of the route passing through or adjoining or within 100 m of forest boundary, approx. km	3.1			
Width wise classification	Single Lane (<5.5 m)	Inter-mediate (5.5 m - 6.9 m)	Two Lane (7 m - 9.9 m)	Multi-lane (>=10 m)
km	0.0	2.4	81.0	13.8

EXISTING AND RESULTANT TRAFFIC INTENSITY

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-01	Near Katora village (Katora to Plant road)	Rural	7	15000	30000	6158	200	600	6883	41.1	45.9
CP-02	Near Katora village (Katora to Beriya road)	Rural	7	15000	30000	4709	200	600	5405	31.4	36.0
CP-06	Near Beriya village	Rural	7	15000	30000	5270	200	600	5977	35.1	39.8
CP-07	Near Issar pump, Barud	Rural	7	15000	30000	5926	200	600	6646	39.5	44.3
CP-08	Near Barud village	Rural	8.6	15000	30000	8584	200	600	9358	57.2	62.4
CP-09	Sanaw ad by-pass - During peak - 7:00-8:00 AM	Urban	7	1500	2142.9	442	13	39	490	29.5	32.7
CP-10	Near Indian Oil Pump, Sanaw ad - During peak - 12:00-1:00 PM	Urban	7	1500	2142.9	2920	13	39	3018	194.7	201.2*
CP-16	Near River Bridge at Sanaw ad - During peak - 3:00-4:00 PM	Urban	7.5	1500	2142.9	1970	13	39	2049	131.3	136.6*

Census Point No.	Location	Type	Road width at the census point location, m	DSV# of the road, PCU/day	Maximum capacity##, PCU/day	Existing traffic, PCU/day	NTPC's trucks, in Nos.	NTPC's trucks, in PCU/day	Resultant traffic (existing+ projected after 1 year+NTPC's trucks), PCU/day	% utilization	
										Before	After
CP-18	Near Dhangaon Village - at LoS B	Rural	7.3	15000	30000	14599	200	600	15495	97.3	103.3*
	at LoS C			21000						69.5	73.8
CP-19	Near Deshgaon Village	Rural	7.8	15000	30000	12073	200	600	12918	80.5	86.1
CP-20	Near jain Dhaba, Chhaigaon Makhan Village - at LoS B	Rural	7.2	15000	30000	18547	200	600	19524	123.6	130.2*
	at LoS C			21000						88.3	93.0
CP-26	Near Chhaigaon Makhan Village on Khandw a road		10	15000	30000	10230	200	600	11038	68.2	73.6
CP-27	Near Khandw a railw ay goods yard - During peak- 6:00-7:00 AM	Urban	8.2	1500	2142.9	1278	13	39	1343	85.2	89.5

Note: *DSV exceeds during day between 9:00 AM to 5:00 PM only. During this time, traffic movement through Urban road is not proposed.

1. Currently, Dhakalgaon siding is under construction. However, both the proposed railway sidings i.e. Bediya and Dhakalgaon siding are expected to be ready by June/ July, 2019 for use.
2. About 6.8 km length of the road from RW-24 to RW-34 i.e from Dhakalgaon to Sanawad was being widened to 5.5 m from its current width of 3.3-3.8 m. Out of 6.8 km, 1.5 km has already been widened and the widening of the balance left patches is underway.
3. Besides above, two patches of Route-5 i.e RW-131 to RW-132 and RW-133 to RW-134 is having road width 2.3 and 2.5 m, respectively. Length of sum of these two patches is only 0.5 km. The sum of length of these two patches is only 0.5 km. These two stretches pass over two separate old bridges. Near both the stretches, new bridges are under construction. After completion of construction, the route will be shifted to the new bridges. Currently, vehicles are passing over the existing old bridge.
4. During site visit, sharp turn through densely populated area at Barud village was observed which will require manned supervision by NTPC to allow smooth flow of traffic at this turn.
5. At the time of survey, it was found that the maximum parts of the roads are black topped with good road widths and mostly in good condition and very little silt. There is good plantation along the roadside. Further, NTPC has proposed widening of single lane road wherever on the routes and strengthening of roads.
6. Most of roads have good shoulders available on either sides. Thus, they are capable of supporting 15% additional volume than the designed service volume as per IRC 64:1990 if they are prepared/ maintained accordingly. However, for the purpose of calculation of DSV or maximum capacity, no such enhancement has been taken into consideration.

7.0 CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

This study has been conducted to assess the impact of coal transportation on various routes, from the six railway sidings to 2 x 660 MW Khargone Super Thermal Power Project (Khargone STPP) of NTPC Ltd. at Villages Selda and Dalchii in Barwah Tehsil of Khargone District, Madhya Pradesh.

NTPC Ltd. proposes to evacuate maximum 3 rake of coal in a week with capping of 2000 TPD of coal transportation by road from any one of the railway sidings amongst the existing four railway siding i.e MPPKGCL Singhaji Plant Siding, Beed Railway Siding, M/s Nepa Ltd.'s Railway Siding and Khandwa Goods Yard i.e through Route-3, 4, 5 & 6, respectively. However, once the MG to BG Conversion of Khandwa-Nimarkhedi is completed by Indian Railways and sidings up to Bediya or Dhakalgaon railway sidings are completed by RITES, the coal shall be transported

through these two siding only i.e through Route-1 or 2, respectively. These railway sidings are expected to be ready by June/ July, 2019. Coal transportation by road has been proposed till December, 2019 only or till commissioning of railwayline, whichever is earlier.

The maximum (Peak) movement of 200 tippers per day on all routes has been considered for impact assessment on traffic volume, carrying capacity of road, on air and noise quality. However, it may be noted that any one siding will be used at one time. Further, the unloaded coal from one rake i.e 3750 Tonne of coal will be transported over two day. Hence, in reality the impact will always be lower than the peak.

All surveys, calculations and assessments have been carried out in line with Standards available from Indian Road Congress (IRC), Ministry of Environment, Forest and Climate Change (MoEF&CC) and United States Environment Protection Agency (US EPA). Road width along entire length has been measured besides observation of traffic volumes at 15 census points.

Based on the various aspects studied, the following conclusions are arrived at:

(i) From the aspect of Traffic Volume and capacity of the road

Analysis of traffic on roads through urban areas

It can be seen from **Table 10** that at CP-10, 11 & 16, the existing traffic is higher than the DSV during the peak hour in a 24 hour period, but lower than the maximum capacity utilisation. Detailed analysis of the hour-wise traffic volume for the 24 hour period was done and it has been found that traffic remains high during day time only during 9:00 AM to 5:00 PM. Keeping this in mind, movement of coal carrying trucks will be restricted in their movement to only 16 hours during 5:00 PM to 9:00 AM. Thus, the coal transportation will take place when the traffic is within DSV limits.

Analysis of traffic on roads through rural areas

In case of the roads passing through the rural areas, there are total 20 census point. At all the census points except CP-17, the road width will have sufficient capacity to support the existing and the additional proposed traffic at LoS-C (good condition for traffic stream). Amongst these, it can be seen that the road width at 17 Census Points location is sufficient for supporting the existing and the additional proposed traffic at Level of Service B (LoS-B) also which represents very good condition of traffic stream.

The current road width at CP- 17 is too narrow to support even the current traffic volume. However, this road is under widening to 5.5 m. After widening the road will have sufficient capacity to support the traffic at Los-B. This road will be needed for transportation of coal from Dhakalgaon railway

siding. It may be noted that Dhakalgaon railway siding is under construction which is expected to be completed by March, 2019 while the widening of this road expected before March, 2019. Hence, this road has also been considered feasible for transportation of coal after widening.

During site visit, it has been observed that there is a sharp turn through the densely populated area at Barud village. Sometimes congestion occurs, therefore, this location will require manned supervision by NTPC whenever its tippers have movement on this road.

- (ii) **From the aspect of Impact on Ambient Air quality** - Referring to **Table 19** earlier, it can be seen that the maximum resultant air quality values in the study area after addition of incremental ground level concentration, due to plying of additional trucks for PM₁₀, PM_{2.5}, SO₂ and NO₂ will be 86.514 µg/m³, 50.072 µg/m³, 15.28 µg/m³ and 31.67 µg/m³, respectively, which are within the prescribed limit as per NAAQS, 2009.
- (iii) **From the aspect of Impact on Ambient Noise** - The noise level due to movement of tippers on the road is approximately 90 dB(A). The overall Leq noise level will become slightly higher. As the vehicle passes, the noise levels will increase and then decrease. As per the noise monitored in the area, during the study period, it was found that the day time Leq varied from 42.2 to 60.35 dBA while night time Leq varied from 36.78 to 54.33 dBA. The baseline noise levels are within the permissible limit of the National Ambient Air Quality Standards with respect to noise during day time and night time for residential, commercial and industrial land uses, as applicable.
- (iv) **From the aspect of Impact on Human Health**- The incremental values for PM₁₀ and PM_{2.5} have been compared against the Air Quality Guidelines, Second Edition, World Health Organisation Regional Office for Europe, Copenhagen, Denmark, 2000 and found to be lower than the significant figures of 10 µg/m³. Besides particulate matters, resultant air quality values after addition of incremental ground level concentration, due to plying of additional tippers for SO₂ and NO₂ have also been compared against the above said guidelines and found to be lower than the significant figure of 100 µg/m³.
- (v) **From the aspect of Impact on Ecology**- Dust may affect photosynthesis, respiration, transpiration and allow the penetration of phytotoxic gaseous pollutants. Dust from highways and roads are deposited on leaves of road side vegetation and affect by inducing changes in pH, Relative Water Content and species diversity. However, this will be reversible process as the dust on leaves will be washed out during rainy season and in case of high wind. Vegetation act as natural filters by depositing dust particles on their leaf surface, susceptible and highly exposed part of a plant and, thus, makes an important contribution in the improvement of air quality. Leaves act as pollution receptors and decrease dust load of the air.

7.2 Recommendations

Based on the study and observations, the following are recommended:

A. Plantation

1. Carry out additional plantation along the route for dust and noise control on either side of road, in consultation with villagers, where ever possible.
2. Plantation of species like *Azadirachta indica*, *Diospyros melanoxylon*, *Annogeisus acuminate*, *Grewia asiatica*, *Madhuca longifolia* etc. shall be undertaken.
3. Continue to maintain plantation already done and replace damaged saplings.

B. Air pollution mitigation for protection of ecology & human health

1. The tippers used for transportation of coal would be covered with tarpaulin and properly stamped.
2. Trucks with valid PUC certification using unadulterated diesel will be allowed to ply.
3. Vehicles having fitness certificate will be allowed to ply
4. Make provision for tyre washing at unloading point within the power plant.
5. Villagers will be employed to clean the road stretch passing through their villages. For this purpose villagers will be provided with brooms, barrows and other cleaning equipments.
6. Sensitising the drivers about prevention of road kill and handling of wildlife encounters while driving through forest areas.

C. Noise mitigation

1. No honking along the settlements stretch, which would be silence zones.
2. All tippers will undergo preventive maintenance as per manufacturers schedule and their silencers shall be maintained and operational at all times.
3. Plantation shall be carried out along side of the road for noise attenuation and control of air borne dust.

D. Safety

1. Installation of speed bumps near settlements to ensure slow driving

2. Awareness to tipper drivers & local people through hoardings on roads regarding road safety
3. Contact number of crane operators along the routes shall be made available to all vehicle drivers
4. All tippers will carry first aid kits and drivers will be trained in first aid in case of emergency
5. Creating awareness for road safety to local population and drivers and ensuring availability of ambulance facility for the accident victims, if required.
6. Trucks will be prohibited to stop in inhabited areas except in case of break-down.
7. Traffic marshals shall be employed from village population to moderate traffic at the villages, especially at sharp turn of village Barud
8. Trucks will follow a “no horn, low speed” protocol while passing through inhabited stretches.

E. Facilities for Drivers

Following facilities to be provided at the plant and at siding ends, if possible:

- i. Parking facilities for tippers
- ii. Rest room for drivers with attached bath and toilets
- iii. Drinking water with cooler
- iv. Posters and road signs spreading awareness about safety, driving rules, hygiene, sanitation and HIV disease.

ANNEXURES

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F. No. J-13012/54/2010-IA.II (T)

Date: 31st March, 2015

To

M/s NTPC Ltd.
 NTPC Bhawan
 SCOPE Complex
 7, Institutional Area
 Lodhi Road
 New Delhi- 110 003

Subject: *Environmental Clearance to 2x660 MW Khargone Super Critical Thermal Power Project at Village Selda and Dalchi, Khargone District, Madhya Pradesh by M/s. NTPC Ltd.*

Sir,

This has reference to your letters dated 12.02.2015, 24.02.2015 and 26.02.2015 on the subject mentioned above. The Ministry has examined the application for environment clearance for this project. It is noted that the ToR for preparation of EIA/EMP report was accorded by the Ministry on 9th December, 2010 and due to expiry of the validity period for these ToR, fresh ToR was accorded on 25th July, 2014. Public Hearing for the project was conducted by the MPPCB on 24th January, 2012.

2. The land requirement for the project is about 1370 acres of which about 1081.58 acres is already in possession of NTPC. The remaining land shall be acquired and R&R shall be involved in the project. The Latitude and Longitude of the Main Plant, Ash dyke and Township are: 22°03'11" N-22°04'13" N, 22°03'11" N-22° 04'13" N, 22°04'18" N -22° 04'44" N and 75°50'49" E-75°52'26" E, 75°49'52" E-75°50'58" E, 75° 51'25" E-75°52'00" E respectively. There are no National Parks, Wildlife Sanctuaries, Biosphere/Elephant/Tiger Reserves, Heritage sites within 10 km of the project site. There are no major settlements within 5 km from the proposed site and no major industries within 10 km. Nearest railway station is Sanawad on Indore-Khandwa meter gauge about 30 km and Indore- Khandwa SH-27 is about 30 km from the site. Land rate and R&R benefits package was approved by Cabinet, GoMP on 12.09.2012 in consultation with stakeholders. There is no tribal population among the affected families. The project cost is about Rs. 9,181 Crores and the cost towards environmental protection is about Rs. 1,421.2 Crores.



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3. The coal requirement will be about 6.51 MTPA and will be met from Pakribarwadih captive coal block. Environment and Forest Clearances for the coal block were accorded by the Ministry on 19.05.2009 and 17.09.2010 respectively. The Sulphur content and ash content in the coal will be 0.4% - 0.5% and 40 - 43% respectively. The coal transportation shall be by Rail. The water requirement of 3800 cum/hr will be sourced from Omkareshwar dam on Narmada River. Govt. of Madhya Pradesh vide letter dated 02.02.10 has accorded commitment for 55 Cusecs of water from Narmada River for the project. CWC had also accorded concurrence for the withdrawal vide letter dated 27.07.2012. The plant would be designed on zero discharge concept in normal circumstances. Water requirement for the Project shall be optimized with designed COC of 5 for conservation of water. The fly ash utilization/management shall be done as per MOEF Gazette Notification on utilization of fly ash dated 03.11.2009. It is estimated that about 8000 tonne/d i.e. about 2.60 MTPA of fly ash would be produced in the power generation process.

4. Based on the information submitted by you to the Ministry and presentations made by you and your consultant namely M/s Vimta Labs, Hyderabad before the Expert Appraisal Committee (Thermal Power) in its 32nd Meeting held during February 23rd- 24th, 2015, the Ministry hereby accords environmental clearance to the above project under the provisions of Environment Impact Assessment Notification dated September 14, 2006 and amendments therein subject to the compliance of the following Specific and General conditions:

A. Specific Conditions:

- (i) Coal transportation shall be by Rail only. An additional EIA shall be carried out and an EMP shall be prepared for laying down the rail line and alternate mode of transportation, in case rail line gets delayed. The EIA/EMP shall be submitted to the Ministry within one year of issuing the EC.
- (ii) The Sulphur and ash content of coal shall not exceed 0.5 % and 43 % respectively. In case of variation of quality at any point of time, fresh reference shall be made to the Ministry for suitable amendments in the environmental clearance.
- (iii) Latest authenticated satellite imagery shall be submitted to the Regional Office of the Ministry on an annual basis to monitor the environmental alterations of the area.



ANNEXURE : 1 CONTD.

- (iv) Vision document specifying prospective plan for the site shall be formulated and submitted to the Regional Office of the Ministry within **six months**.
- (v) Harnessing solar power within the premises of the plant particularly at available roof tops shall be carried out and status of implementation including actual generation of solar power shall be submitted along with **half yearly monitoring** report.
- (vi) One twin flue stack of 275 m height shall be provided with continuous on-line monitoring system for SO_x, NO_x and PM_{2.5} & PM₁₀. Exit velocity of flue gases shall not be less than 22 m/sec. In addition to the regular parameters, Mercury emission from stack shall also be monitored on **six monthly** basis.
- (vii) High Efficiency Electrostatic Precipitators (ESPs) shall be installed to ensure that particulate emission does not exceed 50 mg/Nm³. Adequate dust extraction system such as cyclones/bag filters and water spray system to control fugitive emissions in dusty areas such as in coal handling and ash handling points, transfer areas and other vulnerable dusty areas shall be provided.
- (viii) COC of atleast 5.0 shall be adopted.
- (ix) Monitoring of surface water quantity and quality shall be conducted regularly and records shall be maintained. The monitoring points shall be located between the plant and drainage in the direction of flow of ground water and records shall be maintained. The monitored data shall be submitted to the Ministry **every six months**.
- (x) Monitoring for heavy metals in ground water in the vicinity of plant shall also be undertaken and monitoring report shall be submitted to the Ministry **every six months**.
- (xi) A well designed rain water harvesting system shall be put in place within six months, which shall comprise of rain water collection from the built up and open area in the plant premises and records shall be kept for the quantity of water harvested **every year** and its use.
- (xii) No water bodies including natural drainage system in the area shall be disturbed due to activities associated with the setting up / operation of the power plant.
- (xiii) Hydrogeology of the area shall be reviewed annually through an institute/ organization of repute to assess impact of surface water and ground water (especially around ash dyke). In case, any deterioration is



- observed specific mitigation measures shall be undertaken immediately. Reports/ data of water quality shall be submitted to the Regional Office of the Ministry **every six months**.
- (xiv) Wastewater generated from the plant shall be treated before discharge to comply with the standards prescribed by the SPCB/CPCB.
- (xv) Additional soil for leveling of the proposed site, if require shall be taken from within the sites (to the extent possible) so that natural drainage system of the area is protected.
- (xvi) Fly ash shall be collected in dry form and storage facility (silos) shall be provided. Unutilized fly ash shall be disposed off in the ash pond in the form of slurry. Mercury and other heavy metals (As, Hg, Cr, Pb etc.) will be monitored in the effluents emanating from the ash pond and in the bottom ash also. No ash shall be disposed off in low lying area.
- (xvii) Fugitive emission of fly ash (dry or wet) shall be controlled such that no agricultural or non-agricultural land is affected. Damage to any land shall be mitigated and suitable compensation shall be provided in consultation with the local Panchayat.
- (xviii) Ash pond shall be lined with HDPE/LDPE lining or any other suitable impermeable media so that no leaching takes place at any point of time. Adequate safety measures shall also be implemented to protect the ash dyke from getting breached.
- (xix) A long term study of radio activity and heavy metals contents on coal to be used shall be carried out through a reputed institute and results shall be analyzed every two years and shall be reported to the Ministry along with the monitoring reports. Thereafter, mechanism for an in-built continuous monitoring for radio activity and heavy metals in coal and fly ash (including bottom ash) shall be put in place.
- (xx) Green Belt of least 50 m width consisting of three tiers of plantations of native species around the plant shall be raised. Wherever 50 m width is not feasible, an adequate justification shall be submitted to the Ministry and appropriate width not less than 20 m shall be planted. Tree density shall not be less than 2500 per ha with survival rate not less than 80 %.
- (xxi) Green belt shall also be developed around the Ash Pond over and above the Green Belt around the plant boundary.
- (xxii) CSR schemes identified based on need based assessment shall be implemented in consultation with the village Panchayat and the District Administration starting from the development of project itself. As part



ANNEXURE : 1 CONTD.

of CSR, prior identification of local employable youth and eventual employment in the project after imparting relevant training shall be also undertaken. Company shall provide separate budget for community development activities and income generating programmes.

- (xxiii) For periodic monitoring of CSR activities, a CSR Committee or a Social Audit committee or a suitable credible external agency shall be appointed. CSR activities shall also be evaluated by an independent external agency. This evaluation shall be both concurrent (**every six months**) and final.
- (xxiv) An Environmental Cell comprising of at least one expert in environmental science/ engineering, ecology, occupational health and social science shall be created preferably at the project site itself and shall be headed by an officer of appropriate seniority and qualification. It shall be ensured that the Head of the Cell shall directly report to the Head of the Plant who would be accountable for implementation of environmental regulations and social impact improvement/mitigation measures.

B. General Conditions:

- (i) Space for FGD shall be provided for future installation, if required.
- (ii) The treated effluents conforming to the prescribed standards under Environment (Protection) Act, 1986 only shall be re-circulated and reused within the plant. Arrangements shall be made that effluents and storm water do not get mixed.
- (iii) A sewage treatment plant shall be provided (as applicable) and the treated sewage shall be used for raising greenbelt/plantation.
- (iv) Adequate safety measures shall be provided in the plant area to check/minimize spontaneous fires in coal yard, especially during summer season. Copy of these measures with full details along with location, plant layout etc., as an when finalized, shall be submitted to the Ministry as well as to the Regional Office of the Ministry.
- (v) Separate storage facilities for auxiliary liquid fuel such as LDO/ HFO/LSHS shall be made in the plant area in consultation with Department of Explosives, Nagpur. Sulphur content in the liquid fuel will not exceed 0.5%. Provisions of the Manufacture, Storage and Import of Hazardous Chemical Rules and The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 shall



be applicable as per the quantity stored. Disaster Management System shall be established as per the Disaster Management Plan to meet any eventuality in case of an accident taking place due to storage of oil.

- (vi) First Aid and sanitation arrangements shall be made for the drivers and other contract workers during construction phase.
- (vii) Noise levels from turbines in work zone shall be limited to 85 dB(A) from source. For people working in the high noise area, requisite personal protective equipment like earplugs/ear muffs etc. shall be provided. Workers engaged in noisy areas such as turbine area, air compressors etc shall be periodically examined to maintain audiometric record and for treatment for any hearing loss including shifting to non noisy/less noisy areas.
- (viii) Regular monitoring of ambient air ground level concentration of SO₂, NO_x, PM_{2.5} & PM₁₀ and Hg shall be carried out in the impact zone of the project and record shall be maintained. In case these levels exceed the prescribed limits, necessary control measures shall be taken immediately. The location of the monitoring stations and frequency of monitoring shall be decided in consultation with SPCB. Monitoring reports shall be submitted to the Regional Office of this Ministry **every six months**. The data shall also be uploaded on the website of the company.
- (ix) Fly Ash generated shall be utilized 100% from the 4th year of operation of the power plant. Status of fly ash utilization shall be reported **each year** to the Regional Office of the Ministry.
- (x) Provision shall be made for the housing of construction labour (as applicable) within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
- (xi) The project proponent shall advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned within seven days from the date of receipt of this clearance letter, informing that the project has been accorded environmental clearance and copies of clearance letter are available with the State Pollution Control



Board/Committee and may also be seen at Website of the Ministry of Environment and Forests at <http://envfor.nic.in>.

- (xii) A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad / Municipal Corporation, urban local Body and the Local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the website of the Company by the proponent.
- (xiii) The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same **every six months**. It shall simultaneously be sent to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB.
- (xiv) The criteria pollutant levels namely; SPM, RSPM (PM_{2.5} & PM₁₀), SO₂, NO_x (ambient levels as well as stack emissions) shall be displayed at a convenient location near the main gate of the company in the public domain.
- (xv) The environment statement for each financial year ending 31st March in Form-V as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall be submitted by the project proponent to the concerned State Pollution Control Board. The same shall also be uploaded on the website of the company along with the status of compliance of environmental clearance conditions and shall also be sent to the respective Regional Offices of the Ministry by e-mail.
- (xvi) **The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment and Forests, its Regional Office, Central Pollution Control Board and State Pollution Control Board. The project proponent shall upload the status of compliance of the environmental clearance conditions on their website and update the same every six months and simultaneously send the same by e-mail to the Regional Office, Ministry of Environment and Forests.**
- (xvii) Regional Office of the Ministry of Environment & Forests will monitor the implementation of the stipulated conditions. A complete set of documents including Environmental Impact Assessment Report and Environment Management Plan along with the additional information



submitted from time to time shall be forwarded to the Regional Office for their use during monitoring.

- (xviii) The details of the funds along with item-wise break-up of Rs.1421.2 crores allocated for implementation of environmental protection measures shall be submitted to the Ministry. This cost shall be included as part of the project cost. The funds earmarked for the environment protection measures shall not be diverted for other purposes and year-wise expenditure shall be reported to the Ministry.
 - (xix) The project authorities shall inform the Regional Office as well as the Ministry regarding the date of financial closure and final approval of the project by the concerned authorities and the dates of start of land development work and commissioning of plant.
 - (xx) Full cooperation shall be extended to the Scientists/Officers from the Ministry / Regional Office of the Ministry / CPCB/ SPCB who would be monitoring the compliance of environmental status.
5. The Ministry reserves the right to revoke the clearance if conditions stipulated are not implemented to the satisfaction. The Ministry may also impose additional environmental conditions or modify the existing ones, if necessary.
6. The environmental clearance accorded **shall be valid for a period of 5 years** from the date of issue of this letter to start operation of the power plant.
7. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
8. In case of any deviation or alteration in the project proposed including coal transportation system from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of the condition(s) imposed and to add additional environmental protection measures required, if any.
9. The above stipulations would be enforced among others under the Water (Prevention and Control of Pollution) Act, 1974, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and rules there under, Hazardous Wastes (Management, Handling & Transboundary Movement) Rules, 2008 and its amendments, the Public Liability Insurance Act, 1991 and its amendments.



10. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

Yours faithfully,

(Sanchita Jindal)
Scientist 'F' & Director (T)

✓ Copy to:

1. The Secretary, Ministry of Power, Shram Shakti Bhawan, Rafi Marg, New Delhi 110001.
2. The Chairman, Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066.
3. The Chairman, Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
4. The Secretary, Department of Environment, Government of Madhya Pradesh, Bhopal.
5. The Chairman, Madhya Pradesh Pollution Control Board, E-5, Arera Colony, Paryavaran Parisar, Bhopal-462016, Madhya Pradesh.
6. The Chief Conservator of Forests, Regional Office (WZ), E-5, Kendriya Paryavaran Bhawan, Arera Colony, Ravishankar Nagar, Bhopal - 462016.
7. The Collector, District Khargone, M.P.
8. Guard file/Monitoring file.


(Sanchita Jindal)
Scientist 'F' & Director (T)

ROUTE WISE DETAILS OF ROAD SECTIONS AND LENGTHS

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
Route-1: Bediya Railway siding to KSTPP via Beriya and Roriya												
RW-01	22°05'18.93"	75°56'58.83"	RW-01 to RW-02 = 0.96	0.96	10.5	1.4	2	7.1	-	Black topped	Good	No Change
RW-02	22°04'50.52"	75°57'06.42"	RW-02 to RW-03 = 4.17	5.13	9.9	1.2	1.7	7	-	Black topped	Good	No Change
RW-03	22°02'51.14"	75°56'35.74"	RW-03 to RW-04 = 0.99	6.12	9.2	1.2	1	7	-	Black topped	Good	No Change
RW-04	22°02'24.82"	75°56'37.02"	RW-04 to RW-05 = 1.52	7.64	12	2.6	2.4	7	-	Black topped	Good	No Change
RW-05	22°01'47.58"	75°56'11.97"	RW-05 to RW-06 = 2.75	10.39	10.7	1.9	1.8	7	-	Black topped	Good	No Change
RW-06	22°00'49.76"	75°54'58.50"	RW-06 to RW-07 = 0.48	10.87	9.3	1.1	1	7.2	-	Black topped	Good	No Change
RW-07	22°00'38.78"	75°54'42.43"	RW-07 to RW-08 = 0.29	11.16	7.1	0	0.5	6.6	-	Black topped	Good	No Change
RW-08	22°00'33.75"	75°54'37.74"	RW-08 to RW-09 = 0.24	11.4	10.6	2	1.2	7.4	-	Black topped	Good	No Change
RW-09	22°00'30.39"	75°54'33.12"	RW-09 to RW-10 = 0.8	12.2	10.8	2	1.8	7	-	Black topped	Good	No Change
RW-10	22°00'47.50"	75°54'09.84"	RW-10 to RW-11 = 0.05	12.25	9.9	2.3	1.9	5.7	-	Black topped	Good	No Change
RW-11	22°00'47.50"	75°54'08.93"	RW-11 to RW-12 = 0.12	12.37	7.7	0	0	7.7	-	Black topped	Good	No Change
RW-12	22°00'51.20"	75°54'08.54"	RW-12 to RW-13 = 0.28	12.65	8.8	2	1	5.8	-	Concrete	Good	No Change
RW-13	22°00'59.64"	75°54'08.91"	RW-13 to RW-14 = 3.52	16.17	10	1.7	2.5	5.8	-	Black topped	Good	No Change
RW-14	22°02'09.91"	75°53'06.21"	RW-14 to RW-15 = 2.49	18.66	8.8	1.5	1.3	6	-	Black topped	Good	No Change
RW-15	22°03'04.76"	75°52'35.99"	RW-15 to RW-16 = 0.71	19.37	8.6	1.7	1.2	5.7	-	Black topped	Good	No Change
RW-16	22°03'24.58"	75°52'24.86"	RW-16 to RW-17 = 0.63	20	9.8	2.3	2	5.5	-	Black topped	Good	No Change
RW-17	22°03'37.67"	75°52'18.85"	RW-17 to RW-18 = 0.06	20.06	10.7	1.5	2	7.2	-	Black topped	Good	No Change
RW-18	22°03'38.95"	75°52'18.98"	RW-18 to RW-19 = 0.58	20.64	9	2	1.8	5.2	-	Black topped	Good	No Change
RW-19	22°03'44.09"	75°52'04.13"	RW-19 to RW-20 = 0.64	21.28	10.4	3	2	5.4	-	Black topped	Good	No Change
RW-20	22°04'01.55"	75°51'59.67"	RW-20 to RW-21 = 0.43	21.71	10.6	1.2	2.4	7	-	Black topped	Good	No Change
RW-21	22°04'06.51"	75°51'53.16"	RW-21 to RW-22 = 0.47	22.18	10.6	2.1	1.5	7	-	Black topped	Good	No Change
RW-22	22°04'07.11"	75°51'37.38"	RW-22 to RW-23 = 0.42	22.6	10.7	1.7	1.8	7.2	-	Black topped	Good	No Change
RW-23	22°04'06.83"	75°51'23.15"			Plant Gate							

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
Route-2: Dakhalgaon Railway siding to KSTPP via Sanawad, Beriya and Katora												
RW-24	22°06'47.29"	76°03'55.10"	RW-24 to RW-25 = 0.7	0.7	9.5	2	2	5.5	-	Concrete	Good	No Change
RW-25	22°07'06.45"	76°03'44.89"	RW-25 to RW-26 = 0.07	0.77	6.3	1	2	3.3	-	Black topped	Need widening	Under widening to 5.5 m
RW-26	22°07'07.97"	76°03'44.95"	RW-26 to RW-27 = 0.55	1.32	5.4	1.2	1.1	3.1	-	Black topped	Good	Under widening to 5.5 m
RW-27	22°07'23.02"	76°03'50.70"	RW-27 to RW-28 = 0.79	2.11	5.6	0	0	5.6	-	Concrete	Good	No Change
RW-28	22°07'48.41"	76°03'57.09"	RW-28 to RW-29 = 1.27	3.38	6.4	1.4	1.3	3.7	-	Black topped	Need widening	Under widening to 5.5 m
RW-29	22°08'22.78"	76°04'03.58"	RW-29 to RW-30 = 0.22	3.6	4.4	0	1.1	3.3	-	Black topped	Need widening	Under widening to 5.5 m
RW-30	22°08'28.82"	76°04'04.71"	RW-30 to RW-31 = 0.8	4.4	5.9	1.4	0.7	3.8	-	Black topped	Need widening	Under widening to 5.5 m
RW-31	22°08'51.95"	76°04'11.27"	RW-31 to RW-32 = 0.17	4.57	5	1.2	0	3.8	-	Black topped	Need widening	Under widening to 5.5 m
RW-32	22°08'56.73"	76°04'13.16"	RW-32 to RW-33 = 0.39	4.96	7.4	1.8	1.8	3.8	-	Black topped	Good	Under widening to 5.5 m
RW-33	22°09'08.99"	76°04'14.66"	RW-33 to RW-34 = 1.88	6.84	7.8	2	2	3.8	-	Black topped	Good	Under widening to 5.5 m
RW-34	22°10'2.05"	76°04'21.08"	RW-34 to RW-35 = 0.33	7.17	10.8	1.7	1.6	7.5	-	Black topped	Good	No Change
RW-35	22°10'09.90"	76°04'21.44"	RW-35 to RW-36 = 0.19	7.36	11.3	2.3	2.4	6.6	-	Black topped	Good	No Change
RW-36	22°10'11.15"	76°04'26.84"	RW-36 to RW-37 = 0.32	7.68	9.8	1.6	1.6	6.6	-	Black topped	Good	No Change
RW-37	22°10'21.77"	76°04'26.30"	RW-37 to RW-38 = 0.09	7.77	9.8	1.6	1.6	6.6	-	Black topped	Good	No Change
RW-38	22°10'23.67"	76°04'25.20"	RW-38 to RW-39 = 1.32	9.09	12.6	2.8	2.8	7	-	Black topped	Good	No Change
RW-39	22°11'00.73"	76°04'06.58"	RW-39 to RW-40 = 0.06	9.15	7.6	0	0	7.6	-	Concrete	Good	No Change
RW-40	22°11'00.73"	76°04'05.94"	RW-40 to RW-41 = 0.16	9.31	9.1	0.7	0.7	7.7	-	Concrete	Good	No Change
RW-41	22°11'00.45"	76°04'01.42"	RW-41 to RW-42 = 0.58	9.89	8.4	0.7	0.7	7	-	Concrete	Good	No Change
RW-42	22°10'48.18"	76°03'41.93"	RW-42 to RW-43 = 1	10.89	6	0	0	6	-	Concrete	Good	No Change
RW-43	22°10'17.74"	76°03'41.31"	RW-43 to RW-44 = 0.14	11.03	8.6	0	0	8.6	-	Concrete	Good	No Change
RW-44	22°10'14.33"	76°03'42.32"	RW-44 to RW-45 = 0.07	11.1	11.5	1.1	1.1	9.3	-	Black topped	Good	No Change
RW-45	22°10'13.20"	76°03'42.03"	RW-45 to RW-46 = 2.82	13.92	10.4	1.7	1.7	7	-	Black topped	Good	No Change
RW-46	22°09'49.91"	76°02'13.57"	RW-46 to RW-47 = 2	15.92	8.6	0	0	8.6	-	Black topped	Good	No Change
RW-47	22°09'53.00"	76°01'42.69"	RW-47 to RW-48 = 0.12	16.04	6.7	0	0	6.7	-	Black topped	Good	No Change
RW-48	22°09'50.63"	76°01'43.00"	RW-48 to RW-49 = 6.19	22.23	10.8	1.9	1.9	7	-	Black topped	Good	No Change
RW-49	22°07'44.52"	75°58'55.16"	RW-49 to RW-50 = 4.19	26.42	9.9	1.7	1.2	7	-	Black topped	Good	No Change
RW-50	22°06'19.11"	75°57'24.57"	RW-50 to RW-51 = 0.54	26.96	10.3	2.1	1.8	6.4	-	Black topped	Good	No Change
RW-51	22°06'07.37"	75°57'09.91"	RW-51 to RW-52 = 0.22	27.18	7	0	0	7	-	Black topped	Good	No Change
RW-52	22°06'04.99"	75°57'06.72"	RW-52 to RW-53 = 0.69	27.87	10.6	1.3	2.2	7.1	-	Black topped	Good	No Change
RW-53	22°06'16.46"	75°56'45.49"	RW-53 to RW-54 = 3.74	31.61	9.5	1.1	1.4	7	-	Black topped	Good	No Change
RW-54	22°07'15.20"	75°54'58.00"	RW-54 to RW-55 = 0.26	31.87	7.1	0	0	7.1	-	Black topped	Good	No Change
RW-55	22°07'18.84"	75°54'48.07"	RW-55 to RW-56 = 0.08	31.95	6.1	0	0	6.1	-	Black topped	Good	No Change
RW-56	22°07'18.59"	75°54'46.61"	RW-56 to RW-57 = 2.07	34.02	10	1.6	1.4	7	-	Black topped	Good	No Change
RW-57	22°07'25.84"	75°53'33.29"	RW-57 to RW-58 = 1.88	35.9	9.4	1	1.4	7	-	Black topped	Good	No Change
RW-58	22°07'35.60"	75°52'35.43"	RW-58 to RW-59 = 0.81	36.71	11.4	2.4	1.9	7.1	-	Black topped	Good	No Change
RW-59	22°07'46.38"	75°52'03.14"	RW-59 to RW-60 = 0.52	37.23	9.4	1.3	1.1	7	-	Black topped	Good	No Change
RW-60	22°07'43.51"	75°51'45.74"	RW-60 to RW-61 = 0.1	37.33	11.2	3.4	1.2	6.6	-	Black topped	Good	No Change
RW-61	22°07'42.34"	75°51'45.82"	RW-61 to RW-62 = 0.56	37.89	12.9	2.6	3.3	7	-	Black topped	Good	No Change
RW-62	22°07'24.33"	75°51'53.46"	RW-62 to RW-63 = 1.03	38.92	14	3.4	3.6	7	-	Black topped	Good	No Change
RW-63	22°06'45.16"	75°52'10.69"	RW-63 to RW-64 = 2.61	41.53	13.3	3.2	3.1	7	-	Black topped	Good	No Change
RW-64	22°05'41.48"	75°52'17.96"	RW-64 to RW-65 = 1.36	42.89	12.2	2.8	2.4	7	-	Black topped	Good	No Change
RW-65	22°04'59.97"	75°52'08.39"	RW-65 to RW-66 = 2.22	45.11	11.4	1.5	2.8	7.1	-	Black topped	Good	No Change
RW-66	22°04'06.82"	75°51'51.99"	RW-66 to RW-22 = 0.47	45.58	10.6	2.1	1.5	7	-	Black topped	Good	No Change
RW-22	22°04'07.11"	75°51'37.38"	RW-22 to RW-23 = 0.42	46	10.7	1.7	1.8	7.2	-	Black topped	Good	No Change
RW-23	22°04'06.83"	75°51'23.15"	Plant Gate	46								

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
Route-3: Singha ji Plansiding to KSTPP via Mundi, Mohana, Sanawad, Beriya and Katora												
RW-67	22°06'24.35	076°31'33.81	RW-67 to RW-68 = 0.47	0.47	9.7	1.2	1.5	7	-	Concrete	Good	No Change
RW-68	22°06'27.04	076°31'20.42	RW-68 to RW-69 = 0.11	0.58	9.2	1	1	7.2	-	Concrete	Good	No Change
RW-69	22°06'24.33	076°31'17.72	RW-69 to RW-70 = 1.91	2.49	10	1.9	1.1	7	-	Black topped	Good	No Change
RW-70	22°05'34.21	076°30'49.31	RW-70 to RW-71 = 2.6	5.09	10.6	1.3	1.3	8	-	Black topped	Good	No Change
RW-71	22°04'26.07	076°30'05.16	RW-71 to RW-72 = 0.09	5.18	8.8	1	0.8	7	-	Black topped	Good	No Change
RW-72	22°04'26.88	076°30'02.94	RW-72 to RW-73 = 1.64	6.82	10	1.6	1.4	7	-	Black topped	Good	No Change
RW-73	22°04'41.41	076°29'17.65	RW-73 to RW-74 = 0.96	7.78	11.4	2.4	2	7	-	Black topped	Good	No Change
RW-74	22°04'15.31	076°29'25.24	RW-74 to RW-75 = 0.34	8.12	15.2	1.6	1	12.6	-	Black topped	Good	No Change
RW-75	22°04'03.50	076°29'26.33	RW-75 to RW-76 = 0.05	8.17	11	0	0	11	-	Black topped	Good	No Change
RW-76	22°04'01.63	076°29'25.72	RW-76 to RW-77 = 0.3	8.47	9.7	0	0	9.7	-	Concrete	Good	No Change
RW-77	22°04'05.28	076°29'13.77	RW-77 to RW-78 = 0.32	8.79	8.6	1.5	1	6.1	-	Black topped	Good	No Change
RW-78	22°04'09.20	076°29'03.66	RW-78 to RW-79 = 1.81	10.6	9.8	1.5	1.6	6.7	-	Black topped	Good	No Change
RW-79	22°04'34.52	076°28'08.93	RW-79 to RW-80 = 0.24	10.84	10.5	1.5	1.6	7.4	-	Black topped	Good	No Change
RW-80	22°04'36.30	076°28'02.30	RW-80 to RW-81 = 0.32	11.16	10	0	0	10	-	Concrete	Good	No Change
RW-81	22°04'38.67	076°27'52.39	RW-81 to RW-82 = 2.09	13.25	9	1.1	1.6	6.3	-	Black topped	Good	No Change
RW-82	22°04'59.83	076°26'43.43	RW-82 to RW-83 = 1.7	14.95	9.1	1.8	1.3	6	-	Black topped	Good	No Change
RW-83	22°05'01.87	076°25'44.90	RW-83 to RW-84 = 0.5	15.45	9.5	0	0	9.5	-	Concrete	Good	No Change
RW-84	22°05'05.94	076°25'28.69	RW-84 to RW-85 = 3.17	18.62	8.2	1.2	1.3	5.7	-	Black topped	Good	No Change
RW-85	22°05'56.91	076°23'55.79	RW-85 to RW-86 = 0.81	19.43	10	0	0	10	-	Concrete	Good	No Change
RW-86	22°06'08.42	076°23'36.01	RW-86 to RW-87 = 5.26	24.69	8.8	1.9	1.3	5.6	-	Black topped	Good	No Change
RW-87	22°07'30.01	076°21'7.71	RW-87 to RW-88 = 0.19	24.88	9.5	0	0	9.5	-	Concrete	Good	No Change
RW-88	22°07'32.56	076°21'01.50	RW-88 to RW-89 = 0.26	25.14	8.5	1.5	0	7	-	Black topped	Good	No Change
RW-89	22°07'37.43	076°20'56.81	RW-89 to RW-90 = 1.92	27.06	8.4	1.4	1.2	5.8	-	Black topped	Good	No Change
RW-90	22°08'21.13	076°20'20.89	RW-90 to RW-91 = 0.33	27.39	9.2	1.2	1	7	-	Black topped	Good	No Change
RW-91	22°08'24.03	076°20'05.68	RW-91 to RW-92 = 0.59	27.98	10	0	0	10	-	Concrete	Good	No Change
RW-92	22°08'25.58	076°19'48.52	RW-92 to RW-93 = 2.17	30.15	8.8	1.3	1.5	6	-	Black topped	Good	No Change
RW-93	22°07'59.03	076°18'43.79	RW-93 to RW-94 = 0.8	30.95	9.1	0	0	9.1	-	Black topped	Good	No Change
RW-94	22°07'49.58	076°18'16.65	RW-94 to RW-95 = 2.7	33.65	8.5	1.2	1.2	6.1	-	Black topped	Good	No Change
RW-95	22°07'10.46	076°16'52.98	RW-95 to RW-96 = 0.49	34.14	9.2	0	1	8.2	-	Black topped	Good	No Change
RW-96	22°07'04.40	076°16'40.47	RW-96 to RW-97 = 0.1	34.24	10	0	0	10	-	Black topped	Good	No Change
RW-97	22°07'02.26	076°16'38.33	RW-97 to RW-98 = 1.06	35.3	8.5	0	0	8.5	-	Concrete	Good	No Change
RW-98	22°06'59.79	076°16'18.69	RW-98 to RW-99 = 2.07	37.37	8.4	1.4	1	6	-	Black topped	Good	No Change
RW-99	22°07'45.02	076°15'23.77	RW-99 to RW-100 = 0.17	37.54	8.6	1.3	1.3	6	-	Black topped	Good	No Change
RW-100	22°07'47.90	076°15'21.47	RW-100 to RW-101 = 2.45	39.99	9.9	1.7	1.2	7	-	Black topped	Good	No Change
RW-101	22°07'57.48	076°14'04.24	RW-101 to RW-102 = 1.3	41.29	9.7	1.4	1.2	7.1	-	Black topped	Good	No Change
RW-102	22°08'10.27	076°13'13.17	RW-102 to RW-103 = 1.23	42.52	10	1.2	1.1	7.7	-	Black topped	Good	No Change
RW-103	22°08'24.27	076°12'36.15	RW-103 to RW-104 = 0.68	43.2	9.9	0.8	1.1	8	-	Black topped	Good	No Change
RW-104	22°08'27.99	076°12'20.77	RW-104 to RW-105 = 3.76	46.96	9.7	1.2	1.5	7	-	Black topped	Good	No Change
RW-105	22°08'37.12	076°10'11.68	RW-105 to RW-106 = 2.29	49.25	9.3	1	1.1	7.2	-	Black topped	Good	No Change
RW-106	22°08'46.73	076°08'53.70	RW-106 to RW-107 = 0.72	49.97	10.8	1	1.1	8.7	-	Black topped	Good	No Change
RW-107	22°08'39.12	076°08'33.46	RW-107 to RW-108 = 0.91	50.88	15.8	0	0	15.8	-	Black topped	Good	No Change
RW-108	22°08'57.57	076°08'17.08	RW-108 to RW-109 = 1.75	52.63	9.2	1.1	1.1	7	-	Black topped	Good	No Change
RW-109	22°09'31.77	076°07'38.37	RW-109 to RW-110 = 1.96	54.59	10.1	1.4	1	7.7	-	Black topped	Good	No Change
RW-110	22°10'01.22	076°06'45.08	RW-110 to RW-111 = 1.03	55.62	9.3	1	1.2	7.1	-	Black topped	Good	No Change
RW-111	22°10'18.78	076°06'07.42	RW-111 to RW-112 = 2.04	57.66	9.7	1.4	1.3	7	-	Black topped	Good	No Change
RW-112	22°10'27.49	076°05'08.48	RW-112 to RW-113 = 0.72	58.38	10.9	1.8	1.9	7.2	-	Black topped	Good	No Change

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
RW-113	22°10'29.22	076°04'50.75	RW-113 to RW-114 = 0.37	58.75	9.2	0	0	9.2	-	Black topped	Good	No Change
RW-114	22°10'30.21	076°04'33.14	RW-114 to RW-115 = 0.13	58.88	9.1	1.1	1	7	-	Black topped	Good	No Change
RW-115	22°10'31.43	076°04'29.91	RW-115 to RW-116 = 0.06	58.94	8.9	0	1.3	7.6	-	Black topped	Good	No Change
RW-116	22°10'30.91	076°04'28.46	RW-116 to RW-117 = 0.18	59.12	15	0	0	15	-	Black topped	Good	No Change
RW-117	22°10'25.59	076°04'23.49	RW-117 to RW-39 = 1.32	60.44	12.6	2.8	2.8	7	-	Black topped	Good	No Change
RW-39	22°11'00.73"	76°04'06.58"	RW-39 to RW-40 = 0.06	60.5	7.6	0	0	7.6	-	Concrete	Good	No Change
RW-40	22°11'00.73"	76°04'05.94"	RW-40 to RW-41 = 0.16	60.66	9.1	0.7	0.7	7.7	-	Concrete	Good	No Change
RW-41	22°11'00.45"	76°04'01.42"	RW-41 to RW-42 = 0.58	61.24	8.4	0.7	0.7	7	-	Concrete	Good	No Change
RW-42	22°10'48.18"	76°03'41.93"	RW-42 to RW-43 = 1	62.24	6	0	0	6	-	Concrete	Good	No Change
RW-43	22°10'17.74"	76°03'41.31"	RW-43 to RW-44 = 0.14	62.38	8.6	0	0	8.6	-	Concrete	Good	No Change
RW-44	22°10'14.33"	76°03'42.32"	RW-44 to RW-45 = 0.07	62.45	11.5	1.1	1.1	9.3	-	Black topped	Good	No Change
RW-45	22°10'13.20"	76°03'42.03"	RW-45 to RW-46 = 2.82	65.27	10.4	1.7	1.7	7	-	Black topped	Good	No Change
RW-46	22°09'49.91"	76°02'13.57"	RW-46 to RW-47 = 2	67.27	8.6	0	0	8.6	-	Black topped	Good	No Change
RW-47	22°09'53.00"	76°01'42.69"	RW-47 to RW-48 = 0.12	67.39	6.7	0	0	6.7	-	Black topped	Good	No Change
RW-48	22°09'50.63"	76°01'43.00"	RW-48 to RW-49 = 6.19	73.58	10.8	1.9	1.9	7	-	Black topped	Good	No Change
RW-49	22°07'44.52"	75°58'55.16"	RW-49 to RW-50 = 4.19	77.77	9.9	1.7	1.2	7	-	Black topped	Good	No Change
RW-50	22°06'19.11"	75°57'24.57"	RW-50 to RW-51 = 0.54	78.31	10.3	2.1	1.8	6.4	-	Black topped	Good	No Change
RW-51	22°06'07.37"	75°57'09.91"	RW-51 to RW-52 = 0.22	78.53	7	0	0	7	-	Black topped	Good	No Change
RW-52	22°06'04.99"	75°57'06.72"	RW-52 to RW-53 = 0.69	79.22	10.6	1.3	2.2	7.1	-	Black topped	Good	No Change
RW-53	22°06'16.46"	75°56'45.49"	RW-53 to RW-54 = 3.74	82.96	9.5	1.1	1.4	7	-	Black topped	Good	No Change
RW-54	22°07'15.20"	75°54'58.00"	RW-54 to RW-55 = 0.26	83.22	7.1	0	0	7.1	-	Black topped	Good	No Change
RW-55	22°07'18.84"	75°54'48.07"	RW-55 to RW-56 = 0.08	83.3	6.1	0	0	6.1	-	Black topped	Good	No Change
RW-56	22°07'18.59"	75°54'46.61"	RW-56 to RW-57 = 2.07	85.37	10	1.6	1.4	7	-	Black topped	Good	No Change
RW-57	22°07'25.84"	75°53'33.29"	RW-57 to RW-58 = 1.88	87.25	9.4	1	1.4	7	-	Black topped	Good	No Change
RW-58	22°07'35.60"	75°52'35.43"	RW-58 to RW-59 = 0.81	88.06	11.4	2.4	1.9	7.1	-	Black topped	Good	No Change
RW-59	22°07'46.38"	75°52'03.14"	RW-59 to RW-60 = 0.52	88.58	9.4	1.3	1.1	7	-	Black topped	Good	No Change
RW-60	22°07'43.51"	75°51'45.74"	RW-60 to RW-61 = 0.1	88.68	11.2	3.4	1.2	6.6	-	Black topped	Good	No Change
RW-61	22°07'42.34"	75°51'45.82"	RW-61 to RW-62 = 0.56	89.24	12.9	2.6	3.3	7	-	Black topped	Good	No Change
RW-62	22°07'24.33"	75°51'53.46"	RW-62 to RW-63 = 1.03	90.27	14	3.4	3.6	7	-	Black topped	Good	No Change
RW-63	22°06'45.16"	75°52'10.69"	RW-63 to RW-64 = 2.61	92.88	13.3	3.2	3.1	7	-	Black topped	Good	No Change
RW-64	22°05'41.48"	75°52'17.96"	RW-64 to RW-65 = 1.36	94.24	12.2	2.8	2.4	7	-	Black topped	Good	No Change
RW-65	22°04'59.97"	75°52'08.39"	RW-65 to RW-66 = 2.22	96.46	11.4	1.5	2.8	7.1	-	Black topped	Good	No Change
RW-66	22°04'06.82"	75°51'51.99"	RW-66 to RW-22 = 0.47	96.93	10.6	2.1	1.5	7	-	Black topped	Good	No Change
RW-22	22°04'07.11"	75°51'37.38"	RW-22 to RW-23 = 0.42	97.35	10.7	1.7	1.8	7.2	-	Black topped	Good	No Change
RW-23	22°04'06.83"	75°51'23.15"	Plant Gate	97.35		0	0	0	0	0	0	0

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
Route-4: Bir Railway siding to KSTPP via Mundi, Mohana, Sanawad, Beriya and Katora												
RW-118	22°03'16.38	076°33'02.04	RW-118 to RW-119 = 0.17	0.17	9.4	1.3	1.1	7	-	WBM Type	Need repairing	No change
RW-119	22°03'17.68	076°32'55.85	RW-119 to RW-120 = 0.23	0.4	8.3	1.2	1.4	5.7	-	WBM Type	Need repairing	No change
RW-120	22°03'19.83	076°32'48.87	RW-120 to RW-121 = 0.07	0.47	7.3	1.3	1	5	-	Concrete	Good	No change
RW-121	22°03'21.12	076°32'47.95	RW-121 to RW-122 = 0.51	0.98	8.9	0.9	1.9	6.1	-	Black topped	Good	No change
RW-122	22°03'35.14	076°32'40.94	RW-122 to RW-123 = 0.23	1.21	8.4	1.1	1	6.3	-	Black topped	Good	No change
RW-123	22°03'41.34	076°32'38.58	RW-123 to RW-124 = 1.92	3.13	9.2	1.1	1.1	7	-	Black topped	Average	No change
RW-124	22°04'00.81	076°31'33.31	RW-124 to RW-72 = 2.78	5.91	9.1	1	1.1	7	-	Black topped	Good	No change
RW-72	22°04'26.88	076°30'02.94	RW-72 to RW-73 = 1.64	7.55	10	1.6	1.4	7	-	Black topped	Good	No Change
RW-73	22°04'41.41	076°29'17.65	RW-73 to RW-74 = 0.96	8.51	11.4	2.4	2	7	-	Black topped	Good	No Change
RW-74	22°04'15.31	076°29'25.24	RW-74 to RW-75 = 0.34	8.85	15.2	1.6	1	12.6	-	Black topped	Good	No Change
RW-75	22°04'03.50	076°29'26.33	RW-75 to RW-76 = 0.05	8.9	11	0	0	11	-	Black topped	Good	No Change
RW-76	22°04'01.63	076°29'25.72	RW-76 to RW-77 = 0.3	9.2	9.7	0	0	9.7	-	Concrete	Good	No Change
RW-77	22°04'05.28	076°29'13.77	RW-77 to RW-78 = 0.32	9.52	8.6	1.5	1	6.1	-	Black topped	Good	No Change
RW-78	22°04'09.20	076°29'03.66	RW-78 to RW-79 = 1.81	11.33	9.8	1.5	1.6	6.7	-	Black topped	Good	No Change
RW-79	22°04'34.52	076°28'08.93	RW-79 to RW-80 = 0.24	11.57	10.5	1.5	1.6	7.4	-	Black topped	Good	No Change
RW-80	22°04'36.30	076°28'02.30	RW-80 to RW-81 = 0.32	11.89	10	0	0	10	-	Concrete	Good	No Change
RW-81	22°04'38.67	076°27'52.39	RW-81 to RW-82 = 2.09	13.98	9	1.1	1.6	6.3	-	Black topped	Good	No Change
RW-82	22°04'59.83	076°26'43.43	RW-82 to RW-83 = 1.7	15.68	9.1	1.8	1.3	6	-	Black topped	Good	No Change
RW-83	22°05'01.87	076°25'44.90	RW-83 to RW-84 = 0.5	16.18	9.5	0	0	9.5	-	Concrete	Good	No Change
RW-84	22°05'05.94	076°25'28.69	RW-84 to RW-85 = 3.17	19.35	8.2	1.2	1.3	5.7	-	Black topped	Good	No Change
RW-85	22°05'56.91	076°23'55.79	RW-85 to RW-86 = 0.81	20.16	10	0	0	10	-	Concrete	Good	No Change
RW-86	22°06'08.42	076°23'36.01	RW-86 to RW-87 = 5.26	25.42	8.8	1.9	1.3	5.6	-	Black topped	Good	No Change
RW-87	22°07'30.01	076°21'7.71	RW-87 to RW-88 = 0.19	25.61	9.5	0	0	9.5	-	Concrete	Good	No Change
RW-88	22°07'32.56	076°21'01.50	RW-88 to RW-89 = 0.26	25.87	8.5	1.5	0	7	-	Black topped	Good	No Change
RW-89	22°07'37.43	076°20'56.81	RW-89 to RW-90 = 1.92	27.79	8.4	1.4	1.2	5.8	-	Black topped	Good	No Change
RW-90	22°08'21.13	076°20'20.89	RW-90 to RW-91 = 0.33	28.12	9.2	1.2	1	7	-	Black topped	Good	No Change
RW-91	22°08'24.03	076°20'05.68	RW-91 to RW-92 = 0.59	28.71	10	0	0	10	-	Concrete	Good	No Change
RW-92	22°08'25.58	076°19'48.52	RW-92 to RW-93 = 2.17	30.88	8.8	1.3	1.5	6	-	Black topped	Good	No Change
RW-93	22°07'59.03	076°18'43.79	RW-93 to RW-94 = 0.8	31.68	9.1	0	0	9.1	-	Black topped	Good	No Change
RW-94	22°07'49.58	076°18'16.65	RW-94 to RW-95 = 2.7	34.38	8.5	1.2	1.2	6.1	-	Black topped	Good	No Change
RW-95	22°07'10.46	076°16'52.98	RW-95 to RW-96 = 0.49	34.87	9.2	0	1	8.2	-	Black topped	Good	No Change
RW-96	22°07'04.40	076°16'40.47	RW-96 to RW-97 = 0.1	34.97	10	0	0	10	-	Black topped	Good	No Change
RW-97	22°07'02.26	076°16'38.33	RW-97 to RW-98 = 1.06	36.03	8.5	0	0	8.5	-	Concrete	Good	No Change
RW-98	22°06'59.79	076°16'18.69	RW-98 to RW-99 = 2.07	38.1	8.4	1.4	1	6	-	Black topped	Good	No Change
RW-99	22°07'45.02	076°15'23.77	RW-99 to RW-100 = 0.17	38.27	8.6	1.3	1.3	6	-	Black topped	Good	No Change
RW-100	22°07'47.90	076°15'21.47	RW-100 to RW-101 = 2.45	40.72	9.9	1.7	1.2	7	-	Black topped	Good	No Change
RW-101	22°07'57.48	076°14'04.24	RW-101 to RW-102 = 1.3	42.02	9.7	1.4	1.2	7.1	-	Black topped	Good	No Change
RW-102	22°08'10.27	076°13'13.17	RW-102 to RW-103 = 1.23	43.25	10	1.2	1.1	7.7	-	Black topped	Good	No Change
RW-103	22°08'24.27	076°12'36.15	RW-103 to RW-104 = 0.68	43.93	9.9	0.8	1.1	8	-	Black topped	Good	No Change
RW-104	22°08'27.99	076°12'20.77	RW-104 to RW-105 = 3.76	47.69	9.7	1.2	1.5	7	-	Black topped	Good	No Change
RW-105	22°08'37.12	076°10'11.68	RW-105 to RW-106 = 2.29	49.98	9.3	1	1.1	7.2	-	Black topped	Good	No Change
RW-106	22°08'46.73	076°08'53.70	RW-106 to RW-107 = 0.72	50.7	10.8	1	1.1	8.7	-	Black topped	Good	No Change
RW-107	22°08'39.12	076°08'33.46	RW-107 to RW-108 = 0.91	51.61	15.8	0	0	15.8	-	Black topped	Good	No Change
RW-108	22°08'57.57	076°08'17.08	RW-108 to RW-109 = 1.75	53.36	9.2	1.1	1.1	7	-	Black topped	Good	No Change

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
RW-109	22°09'31.77	076°07'38.37	RW-109 to RW-110 = 1.96	55.32	10.1	1.4	1	7.7	-	Black topped	Good	No Change
RW-110	22°10'01.22	076°06'45.08	RW-110 to RW-111 = 1.03	56.35	9.3	1	1.2	7.1	-	Black topped	Good	No Change
RW-111	22°10'18.78	076°06'07.42	RW-111 to RW-112 = 2.04	58.39	9.7	1.4	1.3	7	-	Black topped	Good	No Change
RW-112	22°10'27.49	076°05'08.48	RW-112 to RW-113 = 0.72	59.11	10.9	1.8	1.9	7.2	-	Black topped	Good	No Change
RW-113	22°10'29.22	076°04'50.75	RW-113 to RW-114 = 0.37	59.48	9.2	0	0	9.2	-	Black topped	Good	No Change
RW-114	22°10'30.21	076°04'33.14	RW-114 to RW-115 = 0.13	59.61	9.1	1.1	1	7	-	Black topped	Good	No Change
RW-115	22°10'31.43	076°04'29.91	RW-115 to RW-116 = 0.06	59.67	8.9	0	1.3	7.6	-	Black topped	Good	No Change
RW-116	22°10'30.91	076°04'28.46	RW-116 to RW-117 = 0.18	59.85	15	0	0	15	-	Black topped	Good	No Change
RW-117	22°10'25.59	076°04'23.49	RW-117 to RW-39 = 1.32	61.17	12.6	2.8	2.8	7	-	Black topped	Good	No Change
RW-39	22°11'00.73"	76°04'06.58"	RW-39 to RW-40 = 0.06	61.23	7.6	0	0	7.6	-	Concrete	Good	No Change
RW-40	22°11'00.73"	76°04'05.94"	RW-40 to RW-41 = 0.16	61.39	9.1	0.7	0.7	7.7	-	Concrete	Good	No Change
RW-41	22°11'00.45"	76°04'01.42"	RW-41 to RW-42 = 0.58	61.97	8.4	0.7	0.7	7	-	Concrete	Good	No Change
RW-42	22°10'48.18"	76°03'41.93"	RW-42 to RW-43 = 1	62.97	6	0	0	6	-	Concrete	Good	No Change
RW-43	22°10'17.74"	76°03'41.31"	RW-43 to RW-44 = 0.14	63.11	8.6	0	0	8.6	-	Concrete	Good	No Change
RW-44	22°10'14.33"	76°03'42.32"	RW-44 to RW-45 = 0.07	63.18	11.5	1.1	1.1	9.3	-	Black topped	Good	No Change
RW-45	22°10'13.20"	76°03'42.03"	RW-45 to RW-46 = 2.82	66	10.4	1.7	1.7	7	-	Black topped	Good	No Change
RW-46	22°09'49.91"	76°02'13.57"	RW-46 to RW-47 = 2	68	8.6	0	0	8.6	-	Black topped	Good	No Change
RW-47	22°09'53.00"	76°01'42.69"	RW-47 to RW-48 = 0.12	68.12	6.7	0	0	6.7	-	Black topped	Good	No Change
RW-48	22°09'50.63"	76°01'43.00"	RW-48 to RW-49 = 6.19	74.31	10.8	1.9	1.9	7	-	Black topped	Good	No Change
RW-49	22°07'44.52"	75°58'55.16"	RW-49 to RW-50 = 4.19	78.5	9.9	1.7	1.2	7	-	Black topped	Good	No Change
RW-50	22°06'19.11"	75°57'24.57"	RW-50 to RW-51 = 0.54	79.04	10.3	2.1	1.8	6.4	-	Black topped	Good	No Change
RW-51	22°06'07.37"	75°57'09.91"	RW-51 to RW-52 = 0.22	79.26	7	0	0	7	-	Black topped	Good	No Change
RW-52	22°06'04.99"	75°57'06.72"	RW-52 to RW-53 = 0.69	79.95	10.6	1.3	2.2	7.1	-	Black topped	Good	No Change
RW-53	22°06'16.46"	75°56'45.49"	RW-53 to RW-54 = 3.74	83.69	9.5	1.1	1.4	7	-	Black topped	Good	No Change
RW-54	22°07'15.20"	75°54'58.00"	RW-54 to RW-55 = 0.26	83.95	7.1	0	0	7.1	-	Black topped	Good	No Change
RW-55	22°07'18.84"	75°54'48.07"	RW-55 to RW-56 = 0.08	84.03	6.1	0	0	6.1	-	Black topped	Good	No Change
RW-56	22°07'18.59"	75°54'46.61"	RW-56 to RW-57 = 2.07	86.1	10	1.6	1.4	7	-	Black topped	Good	No Change
RW-57	22°07'25.84"	75°53'33.29"	RW-57 to RW-58 = 1.88	87.98	9.4	1	1.4	7	-	Black topped	Good	No Change
RW-58	22°07'35.60"	75°52'35.43"	RW-58 to RW-59 = 0.81	88.79	11.4	2.4	1.9	7.1	-	Black topped	Good	No Change
RW-59	22°07'46.38"	75°52'03.14"	RW-59 to RW-60 = 0.52	89.31	9.4	1.3	1.1	7	-	Black topped	Good	No Change
RW-60	22°07'43.51"	75°51'45.74"	RW-60 to RW-61 = 0.1	89.41	11.2	3.4	1.2	6.6	-	Black topped	Good	No Change
RW-61	22°07'42.34"	75°51'45.82"	RW-61 to RW-62 = 0.56	89.97	12.9	2.6	3.3	7	-	Black topped	Good	No Change
RW-62	22°07'24.33"	75°51'53.46"	RW-62 to RW-63 = 1.03	91	14	3.4	3.6	7	-	Black topped	Good	No Change
RW-63	22°06'45.16"	75°52'10.69"	RW-63 to RW-64 = 2.61	93.61	13.3	3.2	3.1	7	-	Black topped	Good	No Change
RW-64	22°05'41.48"	75°52'17.96"	RW-64 to RW-65 = 1.36	94.97	12.2	2.8	2.4	7	-	Black topped	Good	No Change
RW-65	22°04'59.97"	75°52'08.39"	RW-65 to RW-66 = 2.22	97.19	11.4	1.5	2.8	7.1	-	Black topped	Good	No Change
RW-66	22°04'06.82"	75°51'51.99"	RW-66 to RW-22 = 0.47	97.66	10.6	2.1	1.5	7	-	Black topped	Good	No Change
RW-22	22°04'07.11"	75°51'37.38"	RW-22 to RW-23 = 0.42	98.08	10.7	1.7	1.8	7.2	-	Black topped	Good	No Change
RW-23	22°04'06.83"	75°51'23.15"	Plant Gate	98.08								

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
Route-5: Nepa Nagar Railway siding to KSTPP via Sanawad, Beriya and Katora												
RW-125	21°27'00.71	076°23'46.24	RW-125 to RW-126 = 0.59	0.59	7	0	0	7	-	Concrete	Good	No Change
RW-126	21°27'07.57	076°23'35.11	RW-126 to RW-127 = 0.05	0.64	6	0	0	6	-	Concrete	Good	No Change
RW-127	21°27'08.65	076°23'33.46	RW-127 to RW-128 = 0.2	0.84	14.3	0	0	14.3	0.7	Concrete	Good	No Change
RW-128	21°27'15.44	076°23'27.32	RW-128 to RW-129 = 0.39	1.23	8	0	0	8	-	Concrete	Good	No Change
RW-129	21°27'11.93	076°23'12.92	RW-129 to RW-130 = 0.26	1.49	7.8	1.2	1.5	5.1	-	Black topped	Good	No Change
RW-130	21°27'08.04	076°23'06.46	RW-130 to RW-131 = 7.9	9.39	8.7	1.6	1.5	5.6	-	Black topped	Good	No Change
RW-131	21°25'58.79"	76°19'29.30"	RW-131 to RW-132 = 0.27	9.66	6	1.3	2.4	2.3	-	Black topped	Need widening	to be widened to 5.5 m
RW-132	21°25'56.26	076°19'22.09	RW-132 to RW-133 = 2.62	12.28	7.1	1.1	1	5	-	Black topped	Good	No Change
RW-133	21°26'48.16	076°18'14.36	RW-133 to RW-134 = 0.22	12.5	5.7	1.6	1.6	2.5	-	Black topped	Need widening	to be widened to 5.5 m
RW-134	21°26'49.39	076°18'05.25	RW-134 to RW-135 = 2.2	14.7	8	1	1.5	5.5	-	Black topped	Good	No Change
RW-135	21°27'18.66	076°16'58.89	RW-135 to RW-136 = 0.25	14.95	8.5	0	0	8.5	-	Black topped	Good	No Change
RW-136	21°27'23.26	076°16'54.35	RW-136 to RW-137 = 0.07	15.02	11.7	2.7	2	7	-	Black topped	Good	No Change
RW-137	21°27'24.55	076°16'54.83	RW-137 to RW-138 = 0.74	15.76	10.2	1.4	2.1	6.7	-	Black topped	Good	No Change
RW-138	21°27'45.33	076°16'52.77	RW-138 to RW-139 = 0.75	16.51	10.3	2.2	1.9	6.2	-	Black topped	Good	No Change
RW-139	21°28'07.45	076°16'51.9	RW-139 to RW-140 = 4.74	21.25	10.5	1.8	2	6.7	-	Black topped	Good	No Change
RW-140	21°30'14.00	076°18'11.55	RW-140 to RW-141 = 6.82	28.07	11.3	2	2.3	7	-	Black topped	Good	No Change
RW-141	21°33'49.04	076°18'37.27	RW-141 to RW-142 = 6.02	34.09	12.3	2.6	3	6.7	-	Black topped	Good	No Change
RW-142	21°36'29.63	076°19'30.03	RW-142 to RW-143 = 0.59	34.68	11.5	2	3	6.5	-	Black topped	Good	No Change
RW-143	21°36'52.84	076°19'36.85	RW-143 to RW-144 = 2.53	37.21	11.7	2.1	2.6	7	-	Black topped	Good	No Change
RW-144	21°38'11.43	076°19'19.95	RW-144 to RW-145 = 0.23	37.44	4.7	0	0	4.7	-	Black topped	Good	No Change
RW-145	21°38'17.57	076°19'16.96	RW-145 to RW-146 = 3.08	40.52	12.3	2.6	2.7	7	-	Black topped	Good	No Change
RW-146	21°39'36.82	076°18'22.33	RW-146 to RW-147 = 4.96	45.48	11.7	2.2	2.5	7	-	Black topped	Good	No Change
RW-147	21°41'52.61	076°16'39.1	RW-147 to RW-148 = 1.07	46.55	10.3	2.2	1.5	6.6	-	Black topped	Good	No Change
RW-148	21°42'09.21	076°16'11.05	RW-148 to RW-149 = 2.91	49.46	13	3.3	3	6.7	-	Black topped	Good	No Change
RW-149	21°43'36.17	076°15'35.48	RW-149 to RW-150 = 0.3	49.76	23	2	14	7	-	Black topped	Good	No Change
RW-150	21°43'45.94	076°15'32.06	RW-150 to RW-151 = 1.56	51.32	11.5	2.3	2	7.2	-	Black topped	Good	No Change
RW-151	21°44'38.82	076°15'18.20	RW-151 to RW-152 = 6.51	57.83	11.3	2.1	2	7.2	-	Black topped	Good	No Change
RW-152	21°47'53.38	076°14'06.43	RW-152 to RW-153 = 2.86	60.69	11.5	2.1	2.1	7.3	-	Black topped	Good	No Change
RW-153	21°49'17.88	076°13'24.9	RW-153 to RW-154 = 0.88	61.57	10.9	1.4	2.4	7.1	-	Black topped	Good	No Change
RW-154	21°49'44.86	076°13'05.86	RW-154 to RW-155 = 0.23	61.8	11.5	1.2	1.7	8.6	-	Black topped	Good	No Change
RW-155	21°49'49.24"	76°13'03.96"	RW-155 to RW-156 = 3.81	65.61	10	1.4	1.4	7.2	-	Black topped	Good	No Change
RW-156	21°51'34.17"	76°11'55.69"	RW-156 to RW-157 = 16.36	81.97	10.6	1.3	1.5	7.8	-	Black topped	Good	No Change
RW-157	21°59'25.06"	76°09'18.55"	RW-157 to RW-158 = 3.41	85.38	12.4	2.3	2.5	7.6	-	Black topped	Good	No Change
RW-158	22°00'55.68"	76°08'35.33"	RW-158 to RW-159 = 9.08	94.46	12.6	2.7	2.8	7.1	-	Black topped	Good	No Change
RW-159	22°05'00.54"	76°07'09.17"	RW-159 to RW-160 = 5.04	99.5	11.5	2	2.2	7.3	-	Black topped	Good	No Change
RW-160	22°07'19.62"	76°06'10.87"	RW-160 to RW-161 = 4.38	103.88	11.1	2.5	1.6	7	-	Black topped	Good	No Change
RW-161	22°09'11.04"	76°05'06.54"	RW-161 to RW-162 = 2.19	106.07	11	1.6	2.4	7	-	Black topped	Good	No Change
RW-162	22°10'01.95"	76°04'21.58"	RW-162 to RW-35 = 0.33	106.4	10.8	1.7	1.6	7.5	-	Black topped	Good	No Change
RW-35	22°10'09.90"	76°04'21.44"	RW-35 to RW-36 = 0.19	106.59	11.3	2.3	2.4	6.6	-	Black topped	Good	No Change
RW-36	22°10'11.15"	76°04'26.84"	RW-36 to RW-37 = 0.32	106.91	9.8	1.6	1.6	6.6	-	Black topped	Good	No Change
RW-37	22°10'21.77"	76°04'26.30"	RW-37 to RW-38 = 0.09	107	9.8	1.6	1.6	6.6	-	Black topped	Good	No Change
RW-38	22°10'23.67"	76°04'25.20"	RW-38 to RW-39 = 1.32	108.32	12.6	2.8	2.8	7	-	Black topped	Good	No Change
RW-39	22°11'00.73"	76°04'06.58"	RW-39 to RW-40 = 0.06	108.38	7.6	0	0	7.6	-	Concrete	Good	No Change
RW-40	22°11'00.73"	76°04'05.94"	RW-40 to RW-41 = 0.16	108.54	9.1	0.7	0.7	7.7	-	Concrete	Good	No Change
RW-41	22°11'00.45"	76°04'01.42"	RW-41 to RW-42 = 0.58	109.12	8.4	0.7	0.7	7	-	Concrete	Good	No Change
RW-42	22°10'48.18"	76°03'41.93"	RW-42 to RW-43 = 1	110.12	6	0	0	6	-	Concrete	Good	No Change

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
RW-43	22°10'17.74"	76°03'41.31"	RW-43 to RW-44 = 0.14	110.26	8.6	0	0	8.6	-	Concrete	Good	No Change
RW-44	22°10'14.33"	76°03'42.32"	RW-44 to RW-45 = 0.07	110.33	11.5	1.1	1.1	9.3	-	Black topped	Good	No Change
RW-45	22°10'13.20"	76°03'42.03"	RW-45 to RW-46 = 2.82	113.15	10.4	1.7	1.7	7	-	Black topped	Good	No Change
RW-46	22°09'49.91"	76°02'13.57"	RW-46 to RW-47 = 2	115.15	8.6	0	0	8.6	-	Black topped	Good	No Change
RW-47	22°09'53.00"	76°01'42.69"	RW-47 to RW-48 = 0.12	115.27	6.7	0	0	6.7	-	Black topped	Good	No Change
RW-48	22°09'50.63"	76°01'43.00"	RW-48 to RW-49 = 6.19	121.46	10.8	1.9	1.9	7	-	Black topped	Good	No Change
RW-49	22°07'44.52"	75°58'55.16"	RW-49 to RW-50 = 4.19	125.65	9.9	1.7	1.2	7	-	Black topped	Good	No Change
RW-50	22°06'19.11"	75°57'24.57"	RW-50 to RW-51 = 0.54	126.19	10.3	2.1	1.8	6.4	-	Black topped	Good	No Change
RW-51	22°06'07.37"	75°57'09.91"	RW-51 to RW-52 = 0.22	126.41	7	0	0	7	-	Black topped	Good	No Change
RW-52	22°06'04.99"	75°57'06.72"	RW-52 to RW-53 = 0.69	127.1	10.6	1.3	2.2	7.1	-	Black topped	Good	No Change
RW-53	22°06'16.46"	75°56'45.49"	RW-53 to RW-54 = 3.74	130.84	9.5	1.1	1.4	7	-	Black topped	Good	No Change
RW-54	22°07'15.20"	75°54'58.00"	RW-54 to RW-55 = 0.26	131.1	7.1	0	0	7.1	-	Black topped	Good	No Change
RW-55	22°07'18.84"	75°54'48.07"	RW-55 to RW-56 = 0.08	131.18	6.1	0	0	6.1	-	Black topped	Good	No Change
RW-56	22°07'18.59"	75°54'46.61"	RW-56 to RW-57 = 2.07	133.25	10	1.6	1.4	7	-	Black topped	Good	No Change
RW-57	22°07'25.84"	75°53'33.29"	RW-57 to RW-58 = 1.88	135.13	9.4	1	1.4	7	-	Black topped	Good	No Change
RW-58	22°07'35.60"	75°52'35.43"	RW-58 to RW-59 = 0.81	135.94	11.4	2.4	1.9	7.1	-	Black topped	Good	No Change
RW-59	22°07'46.38"	75°52'03.14"	RW-59 to RW-60 = 0.52	136.46	9.4	1.3	1.1	7	-	Black topped	Good	No Change
RW-60	22°07'43.51"	75°51'45.74"	RW-60 to RW-61 = 0.1	136.56	11.2	3.4	1.2	6.6	-	Black topped	Good	No Change
RW-61	22°07'42.34"	75°51'45.82"	RW-61 to RW-62 = 0.56	137.12	12.9	2.6	3.3	7	-	Black topped	Good	No Change
RW-62	22°07'24.33"	75°51'53.46"	RW-62 to RW-63 = 1.03	138.15	14	3.4	3.6	7	-	Black topped	Good	No Change
RW-63	22°06'45.16"	75°52'10.69"	RW-63 to RW-64 = 2.61	140.76	13.3	3.2	3.1	7	-	Black topped	Good	No Change
RW-64	22°05'41.48"	75°52'17.96"	RW-64 to RW-65 = 1.36	142.12	12.2	2.8	2.4	7	-	Black topped	Good	No Change
RW-65	22°04'59.97"	75°52'08.39"	RW-65 to RW-66 = 2.22	144.34	11.4	1.5	2.8	7.1	-	Black topped	Good	No Change
RW-66	22°04'06.82"	75°51'51.99"	RW-66 to RW-22 = 0.47	144.81	10.6	2.1	1.5	7	-	Black topped	Good	No Change
RW-22	22°04'07.11"	75°51'37.38"	RW-22 to RW-23 = 0.42	145.23	10.7	1.7	1.8	7.2	-	Black topped	Good	No Change
RW-23	22°04'06.83"	75°51'23.15"	Plant Gate	145.23								0

Width location	Latitude, N	Longitude, E	Length of Stretch, Km	Distance from Siding, km	Existing Right of way (shoulders + carriage way), m	Existing Shoulder left side, m	Existing Shoulder right side, m	Existing Carriage way width, m	Divider, m	Type of road	Condition of road	Proposed Carriageway width (under widening/ strengthening/ construction), m
Route-6: Khandwa goods & yard to KSTPP via Sanawad, Beriya and Katora												
RW-163	21°48'53.67"	076°20'40.43"	RW-163 to RW-164 = 0.01	0.01	12.4	0	4	8.4	-	Concrete	Good	No Change
RW-164	21°48'55.46	076°20'35.06	RW-164 to RW-165 = 0.07	0.08	11	0	0	11	-	Concrete	Good	No Change
RW-165	21°48'58.77"	76°20'36.04"	RW-165 to RW-166 = 2.18	2.26	17.1	0.5	1.3	15.3	-	Black topped	Good	No Change
RW-166	21°49'30.55"	76°19'32.84"	RW-166 to RW-167 = 0.14	2.4	12.2	1	1	10.2	-	Black topped	Good	No Change
RW-167	21°49'30.18"	76°19'28.31"	RW-167 to RW-168 = 2.94	5.34	11.7	1	0.7	10	-	Black topped	Good	No Change
RW-168	21°49'27.43"	76°17'47.82"	RW-168 to RW-169 = 5.08	10.42	12.3	1	1.3	10	-	Black topped	Good	No Change
RW-169	21°49'09.70"	76°14'53.77"	RW-169 to RW-155 = 3.34	13.76	12.3	1	1.3	10	-	Black topped	Good	No Change
RW-155	21°49'49.24"	76°13'03.96"	RW-155 to RW-156 = 3.81	17.57	10	1.4	1.4	7.2	-	Black topped	Good	No Change
RW-156	21°51'34.17"	76°11'55.69"	RW-156 to RW-157 = 16.36	33.93	10.6	1.3	1.5	7.8	-	Black topped	Good	No Change
RW-157	21°59'25.06"	76°09'18.55"	RW-157 to RW-158 = 3.41	37.34	12.4	2.3	2.5	7.6	-	Black topped	Good	No Change
RW-158	22°00'55.68"	76°08'35.33"	RW-158 to RW-159 = 9.08	46.42	12.6	2.7	2.8	7.1	-	Black topped	Good	No Change
RW-159	22°05'00.54"	76°07'09.17"	RW-159 to RW-160 = 5.04	51.46	11.5	2	2.2	7.3	-	Black topped	Good	No Change
RW-160	22°07'19.62"	76°06'10.87"	RW-160 to RW-161 = 4.38	55.84	11.1	2.5	1.6	7	-	Black topped	Good	No Change
RW-161	22°09'11.04"	76°05'06.54"	RW-161 to RW-162 = 2.19	58.03	11	1.6	2.4	7	-	Black topped	Good	No Change
RW-162	22°10'01.95"	76°04'21.58"	RW-162 to RW-35 = 0.33	58.36	10.8	1.7	1.6	7.5	-	Black topped	Good	No Change
RW-35	22°10'09.90"	76°04'21.44"	RW-35 to RW-36 = 0.19	58.55	11.3	2.3	2.4	6.6	-	Black topped	Good	No Change
RW-36	22°10'11.15"	76°04'26.84"	RW-36 to RW-37 = 0.32	58.87	9.8	1.6	1.6	6.6	-	Black topped	Good	No Change
RW-37	22°10'21.77"	76°04'26.30"	RW-37 to RW-38 = 0.09	58.96	9.8	1.6	1.6	6.6	-	Black topped	Good	No Change
RW-38	22°10'23.67"	76°04'25.20"	RW-38 to RW-39 = 1.32	60.28	12.6	2.8	2.8	7	-	Black topped	Good	No Change
RW-39	22°11'00.73"	76°04'06.58"	RW-39 to RW-40 = 0.06	60.34	7.6	0	0	7.6	-	Concrete	Good	No Change
RW-40	22°11'00.73"	76°04'05.94"	RW-40 to RW-41 = 0.16	60.5	9.1	0.7	0.7	7.7	-	Concrete	Good	No Change
RW-41	22°11'00.45"	76°04'01.42"	RW-41 to RW-42 = 0.58	61.08	8.4	0.7	0.7	7	-	Concrete	Good	No Change
RW-42	22°10'48.18"	76°03'41.93"	RW-42 to RW-43 = 1	62.08	6	0	0	6	-	Concrete	Good	No Change
RW-43	22°10'17.74"	76°03'41.31"	RW-43 to RW-44 = 0.14	62.22	8.6	0	0	8.6	-	Concrete	Good	No Change
RW-44	22°10'14.33"	76°03'42.32"	RW-44 to RW-45 = 0.07	62.29	11.5	1.1	1.1	9.3	-	Black topped	Good	No Change
RW-45	22°10'13.20"	76°03'42.03"	RW-45 to RW-46 = 2.82	65.11	10.4	1.7	1.7	7	-	Black topped	Good	No Change
RW-46	22°09'49.91"	76°02'13.57"	RW-46 to RW-47 = 2	67.11	8.6	0	0	8.6	-	Black topped	Good	No Change
RW-47	22°09'53.00"	76°01'42.69"	RW-47 to RW-48 = 0.12	67.23	6.7	0	0	6.7	-	Black topped	Good	No Change
RW-48	22°09'50.63"	76°01'43.00"	RW-48 to RW-49 = 6.19	73.42	10.8	1.9	1.9	7	-	Black topped	Good	No Change
RW-49	22°07'44.52"	75°58'55.16"	RW-49 to RW-50 = 4.19	77.61	9.9	1.7	1.2	7	-	Black topped	Good	No Change
RW-50	22°06'19.11"	75°57'24.57"	RW-50 to RW-51 = 0.54	78.15	10.3	2.1	1.8	6.4	-	Black topped	Good	No Change
RW-51	22°06'07.37"	75°57'09.91"	RW-51 to RW-52 = 0.22	78.37	7	0	0	7	-	Black topped	Good	No Change
RW-52	22°06'04.99"	75°57'06.72"	RW-52 to RW-53 = 0.69	79.06	10.6	1.3	2.2	7.1	-	Black topped	Good	No Change
RW-53	22°06'16.46"	75°56'45.49"	RW-53 to RW-54 = 3.74	82.8	9.5	1.1	1.4	7	-	Black topped	Good	No Change
RW-54	22°07'15.20"	75°54'58.00"	RW-54 to RW-55 = 0.26	83.06	7.1	0	0	7.1	-	Black topped	Good	No Change
RW-55	22°07'18.84"	75°54'48.07"	RW-55 to RW-56 = 0.08	83.14	6.1	0	0	6.1	-	Black topped	Good	No Change
RW-56	22°07'18.59"	75°54'46.61"	RW-56 to RW-57 = 2.07	85.21	10	1.6	1.4	7	-	Black topped	Good	No Change
RW-57	22°07'25.84"	75°53'33.29"	RW-57 to RW-58 = 1.88	87.09	9.4	1	1.4	7	-	Black topped	Good	No Change
RW-58	22°07'35.60"	75°52'35.43"	RW-58 to RW-59 = 0.81	87.9	11.4	2.4	1.9	7.1	-	Black topped	Good	No Change
RW-59	22°07'46.38"	75°52'03.14"	RW-59 to RW-60 = 0.52	88.42	9.4	1.3	1.1	7	-	Black topped	Good	No Change
RW-60	22°07'43.51"	75°51'45.74"	RW-60 to RW-61 = 0.1	88.52	11.2	3.4	1.2	6.6	-	Black topped	Good	No Change
RW-61	22°07'42.34"	75°51'45.82"	RW-61 to RW-62 = 0.56	89.08	12.9	2.6	3.3	7	-	Black topped	Good	No Change
RW-62	22°07'24.33"	75°51'53.46"	RW-62 to RW-63 = 1.03	90.11	14	3.4	3.6	7	-	Black topped	Good	No Change
RW-63	22°06'45.16"	75°52'10.69"	RW-63 to RW-64 = 2.61	92.72	13.3	3.2	3.1	7	-	Black topped	Good	No Change
RW-64	22°05'41.48"	75°52'17.96"	RW-64 to RW-65 = 1.36	94.08	12.2	2.8	2.4	7	-	Black topped	Good	No Change
RW-65	22°04'59.97"	75°52'08.39"	RW-65 to RW-66 = 2.22	96.3	11.4	1.5	2.8	7.1	-	Black topped	Good	No Change
RW-66	22°04'06.82"	75°51'51.99"	RW-66 to RW-22 = 0.47	96.77	10.6	2.1	1.5	7	-	Black topped	Good	No Change
RW-22	22°04'07.11"	75°51'37.38"	RW-22 to RW-23 = 0.42	97.19	10.7	1.7	1.8	7.2	-	Black topped	Good	No Change
RW-23	22°04'06.83"	75°51'23.15"	Plant Gate	97.19								

PHOTOGRAPHS OF ROAD WIDTH MEASUREMENT LOCATIONS

(Photo coordinate and the stretch it lies on)

RW-01 to RW-02: Carriageway: 7.1 m Coordinates : 22°04'50.52"N, 75°57'06.42"E	RW-01 to RW-03: Carriageway: 7.0 m Coordinates : 22°02'51.14"N,75°56'35.74"E
	
RW-03 to RW-04: Carriageway: 7.0 m Coordinates : 22°02'24.82"N,75°56'37.02"E	RW-04 to RW-05: Carriageway: 7.0 m Coordinates : 22°01'47.58"N,75°56'11.97"E
	
RW-05 to RW-06: Carriageway: 7.0 m Coordinates : 22°00'49.76"N,75°54'58.50"E	RW-06 to RW-07: Carriageway: 7.2 m Coordinates : 22°00'38.78"N,75°54'42.43"E
	

RW-07 to RW-08: Carriageway: 6.6 m Coordinates : 22°00'33.75"N,75°54'37.74"E	RW-08 to RW-09: Carriageway: 7.4 m Coordinates : 22°00'30.39"N,75°54'33.12"E
	
RW-09 to RW-10: Carriageway: 7.0 m Coordinates : 22°00'47.50"N,75°54'09.84"E	RW-10 to RW-11: Carriageway: 5.7 m Coordinates : 22°00'47.50"N,75°54'08.93"E
	
RW-11 to RW-12: Carriageway: 7.7 m Coordinates : 22°00'51.20"N,75°54'08.54"E	RW-12 to RW-13: Carriageway: 5.8 m Coordinates : 22°00'59.64"N,75°54'08.91"E
	

RW-13 to RW-14: Carriageway: 5.8 m Coordinates : 22°02'09.91"N,75°53'06.21"E	RW-14 to RW-15: Carriageway: 6.0 m Coordinates : 22°03'04.76"N,75°52'35.99"E
	
RW-15 to RW-16: Carriageway: 5.7 m Coordinates : 22°03'24.58"N,75°52'24.86"E	RW-16 to RW-17: Carriageway: 5.5 m Coordinates : 22°03'37.67"N,75°52'18.85"E
	
RW-17 to RW-18: Carriageway: 7.2 m Coordinates : 22°03'38.95"N,75°52'18.98"E	RW-18 to RW-19: Carriageway: 5.2 m Coordinates : 22°03'44.09"N,75°52'04.13"E
	

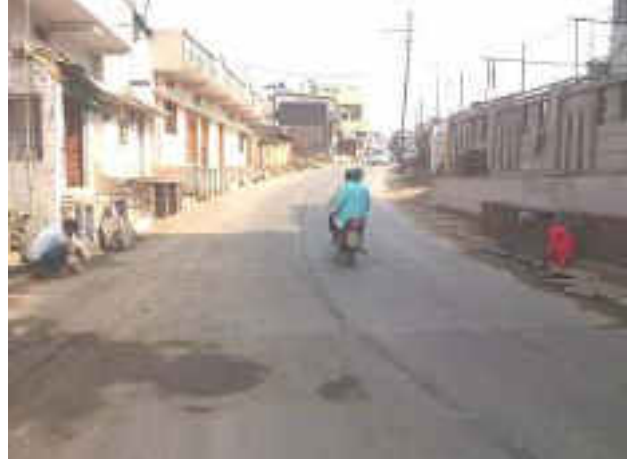
RW-19 to RW-20: Carriageway: 5.4 m Coordinates : 22°04'1.10"N,75°51'59.62"E 	RW-20 to RW-21: Carriageway: 7.0 m Coordinates : 22°04'01.55"N,75°51'59.67"E 
RW-21 to RW-22: Carriageway: 7.0 m Coordinates : 22°04'06.51"N,75°51'53.16"E 	RW-22 to RW-23 (plant): Carriageway: 7.2 m Coordinates : 22°04'07.11" N,75°51'37.38"E 
RW-24 to RW-25: Carriageway: 5.5 m Coordinates : 22°07'06.45"N,76°03'44.89"E 	RW-25 to RW-26: Carriageway: 3.3 m Coordinates : 22°07'07.97" N,76°03'44.95"E 

RW-26 to RW-27: Carriageway: 3.1 m Coordinates : 22°07'23.02"N,76°03'50.70"E 	RW-27 to RW-28: Carriageway: 5.6 m Coordinates : 22°07'48.41" N,76°03'57.09"E 
RW-28 to RW-29: Carriageway: 3.7 m Coordinates : 22°08'22.78"N,76°04'03.58"E 	RW-29 to RW-30: Carriageway: 3.3 m Coordinates : 22°08'28.82" N,76°04'04.71"E 
RW-30 to RW-31: Carriageway: 3.8 m Coordinates : 22°08'51.95"N,76°04'11.27"E 	RW-31 to RW-32: Carriageway: 3.8 m Coordinates : 22°08'56.73" N,76°04'13.16"E 

RW-32 to RW-33: Carriageway: 3.8 m Coordinates : 22°09'08.99"N,76°04'14.66"E	RW-33 to RW-34: Carriageway: 3.8 m Coordinates : 22°10'2.05" N,76°04'21.08"E
	
RW-34 to RW-35: Carriageway: 7.5 m Coordinates :22°10'09.90"N,76°04'21.44"E	RW-35 to RW-36: Carriageway: 6.6 m Coordinates : 22°10'11.15" N,76°04'26.84"E
	
RW-36 to RW-37: Carriageway: 6.6 m Coordinates : 22°10'21.77"N,76°04'26.30"E	RW-37 to RW-38: Carriageway: 6.6 m Coordinates : 22°10'23.67"N,76°04'25.20"E
	

RW-38 to RW-39: Carriageway: 7.0 m Coordinates : 22°11'00.73"N,76°04'06.58"E	RW-39 to RW-40: Carriageway: 7.6 m Coordinates : 22°11'00.73"N,76°04'05.94"E
	
RW-40 to RW-41: Carriageway: 7.7 m Coordinates : 22°11'00.45"N,76°04'01.42"E	RW-41 to RW-42: Carriageway: 7.0 m Coordinates : 22°10'48.18"N,76°03'41.93"E
	
RW-42 to RW-43: Carriageway: 6.0 m Coordinates : 22°10'17.74"N,76°03'41.31"E	RW-43 to RW-44: Carriageway: 8.6 m Coordinates : 22°10'14.33"N,76°03'42.32"E
	

RW-44 to RW-45: Carriageway: 9.3 m Coordinates : 22°10'13.20" N,76°03'42.03"E	RW-45 to RW-46: Carriageway: 7.0 m Coordinates : 22°09'49.91"N,76°02'13.57"E
	
RW-46 to RW-47: Carriageway: 8.6 m Coordinates : 22°09'53.00" N,76°01'42.69"E	RW-47 to RW-48: Carriageway: 6.7 m Coordinates : 22°09'50.63"N,76°01'43.00"E
	
RW-48 to RW-49: Carriageway: 7.0 m Coordinates : 22°07'44.52"N,75°58'55.16"E	RW-49 to RW-50: Carriageway: 7.0 m Coordinates : 22°06'19.11"N,75°58'55.16"E
	

RW-50 to RW-51: Carriageway: 6.4 m Coordinates : 22°06'07.37" N,75°57'09.91"E	RW-51 to RW-52: Carriageway: 7.0 m Coordinates : 22°06'02.22"N, 75°56'54.90"E
	
RW-52 to RW-53: Carriageway: 7.1 m Coordinates : 22°06'16.46"N,75°56'45.49"E	RW-53 to RW-54: Carriageway: 7.0 m Coordinates : 22°07'15.20" N,75°54'58.00"E
	
RW-54 to RW-55: Carriageway: 7.1 m Coordinates : 22°07'18.84"N,75°54'48.07"E	RW-55 to RW-56: Carriageway: 6.1 m Coordinates :22°07'18.59" N,75°54'46.61"E
	

RW-56 to RW-57: Carriageway: 7.0 m Coordinates : 22°07'25.84"N,75°53'33.29"E	RW-57 to RW-58: Carriageway: 7.0 m Coordinates : 22°07'35.60" N,75°52'35.43"E
	
RW-58 to RW-59: Carriageway: 7.1 m Coordinates : 22°07'46.38"N,75°52'03.14"E	RW-59 to RW-60: Carriageway: 7.0 m Coordinates : 22°07'43.51" N,75°51'45.74"E
	
RW-60 to RW-61: Carriageway: 6.6 m Coordinates : 22°07'42.34"N,75°51'45.82"E	RW-61 to RW-62: Carriageway: 7.0 m Coordinates : 22°07'24.33" N,75°51'53.46"E
	

RW-62 to RW-63: Carriageway: 7.0 m Coordinates : 22°06'45.16"N,75°52'10.69"E 	RW-63 to RW-64: Carriageway: 7.0 m Coordinates : 22°05'41.48" N,75°52'17.96"E 
RW-64 to RW-65: Carriageway: 7.0 m Coordinates : 22°04'59.97"N,75°52'08.39"E 	RW-65 to RW-66: Carriageway: 7.1 m Coordinates : 22°04'59.97" N,75°52'08.39"E 
RW-67 to RW-68: Carriageway: 7.0 m Coordinates :22°06'27.04" N,076°31'20.42"E 	RW-68 to RW-69: Carriageway: 7.2 m Coordinates :22°06'24.33"N,076°31'17.72"E 

RW-69 to RW-70: Carriageway: 7.0 m Coordinates : 22°05'34.21" N,076°30'49.31"E 	RW-70 to RW-71: Carriageway: 8.0 m Coordinates : 22°04'26.07"N,076°30'05.16"E 
RW-71 to RW-72: Carriageway: 7.0 m Coordinates :22°04'26.88" N,076°30'02.94"E 	RW-72 to RW-73: Carriageway: 7.0 m Coordinates :22°04'42.59" N,76°29'17.15"E 
RW-73 to RW-74: Carriageway: 7.0 m 22°04'41.41" N,076°29'17.65E 	RW-74 to RW-75: Carriageway: 12.6 m Coordinates :22°04'15.31 N,076°29'25.24"E 

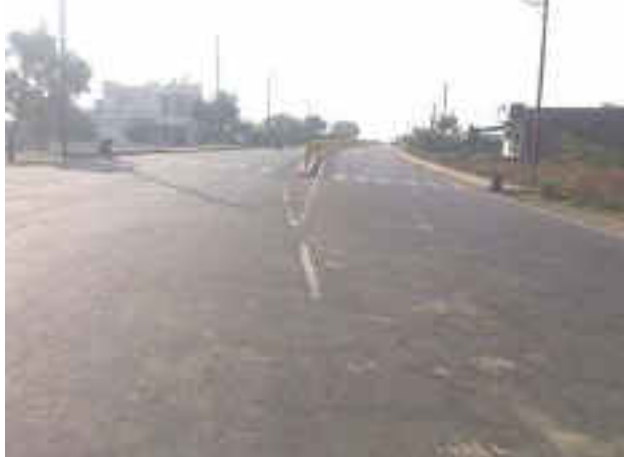
RW-75 to RW-76: Carriageway: 11.0 m Coordinates :22°04'03.50" N,076°29'26.33E 	RW-76 to RW-77: Carriageway: 9.7 m Coordinates :22°04'01.63" N,076°29'25.72"E 
RW-77 to RW-78: Carriageway: 6.1 m Coordinates :22°04'05.28" N,076°29'13.77"E 	RW-78 to RW-79: Carriageway: 6.7 m Coordinates :22°04'09.20" N,076°29'03.66"E 
RW-79 to RW-80: Carriageway: 7.4 m Coordinates :22°04'34.52" N,076°28'08.93"E 	RW-80 to RW-81: Carriageway: 10.0 m Coordinates :22°04'36.30" N,076°28'02.30"E 

RW-81 to RW-82: Carriageway: 6.3 m Coordinates :22°04'38.67" N,076°27'52.39"E	RW-82 to RW-83: Carriageway: 6.0 m Coordinates :22°04'59.83" N,076°26'43.43"E
	
RW-83 to RW-84: Carriageway: 5.5 m Coordinates :22°05'01.87" N,076°25'44.90"E	RW-84 to RW-85: Carriageway: 5.7 m Coordinates :22°05'05.94" N,076°25'28.69"E
	
RW-85 to RW-86: Carriageway: 10.0 m Coordinates :22°05'56.91" N,076°23'55.79"E	RW-86 to RW-87: Carriageway: 5.6 m Coordinates :22°06'08.42" N,076°23'36.01"E
	

RW-87 to RW-88: Carriageway: 9.5 m Coordinates :22°07'35.51" N,076°21'03.91"E	RW-88 to RW-89: Carriageway: 7.0 m Coordinates :22°07'32.56" N,076°21'01.50"E
	
RW-89 to RW-90: Carriageway: 5.8 m Coordinates :22°07'37.43" N,076°20'56.81"E	RW-90 to RW-91: Carriageway: 7.0 m Coordinates :22°08'21.13" N,076°20'20.89"E
	
RW-91 to RW-92: Carriageway: 10.0 m Coordinates :22°08'24.03" N,076°20'05.68"E	RW-92 to RW-93: Carriageway: 6.0 m Coordinates :22°08'25.58" N,076°19'48.52"E
	

RW-93 to RW-94: Carriageway: 9.1 m Coordinates :22°07'59.03" N,76°18'43.79"E	RW-94 to RW-95: Carriageway: 6.1 m Coordinates :22°07'49.58" N,076°18'16.65"E
	
RW-95 to RW-96: Carriageway: 8.2 m Coordinates :22°07'10.46" N,076°16'52.98"E	RW-96 to RW-97: Carriageway: 10.0 m Coordinates :22°07'04.40" N,076°16'40.47"E
	
RW-97 to RW-98: Carriageway: 8.5 m Coordinates :22°07'02.26" N,076°16'38.33"E	RW-98 to RW-99: Carriageway: 6.0 m Coordinates :22°06'59.79" N,076°16'18.69"E
	

RW-99 to RW-100: Carriageway: 6.0 m Coordinates :22°07'45.02" N,076°15'23.77"E	RW-100 to RW-101: Carriageway: 7.0 m Coordinates :22°07'57.48" N,076°14'04.24"E
	
RW-101 to RW-102: Carriageway: 7.1 m Coordinates :22°08'10.27" N,076°13'13.17"E	RW-102 to RW-103: Carriageway: 7.7 m Coordinates :22°08'24.27" N,076°12'36.15"E
	
RW-103 to RW-104: Carriageway: 8.0 m Coordinates :22°08'27.99" N,076°12'20.77"E	RW-104 to RW-105: Carriageway: 7.0 m Coordinates :22°08'37.12" N,076°10'11.68"E
	

RW-105 to RW-106: Carriageway: 7.2 m Coordinates :22°08'46.73" N,076°08'53.70"E	RW-106 to RW-107: Carriageway: 8.7 m Coordinates :22°08'39.12" N,076°08'33.46"E
	
RW-107 to RW-108: Carriageway: 15.8 m Coordinates :22°08'57.57" N,076°08'17.08"E	RW-108 to RW-109: Carriageway: 7.0 m Coordinates :22°09'31.77" N,076°07'38.37"E
	
RW-109 to RW-110: Carriageway: 7.7 m Coordinates :22°10'01.22" N,076°06'45.08"E	RW-110 to RW-111: Carriageway: 7.1 m Coordinates :22°10'18.78" N,076°06'07.42"E
	

RW-111 to RW-112: Carriageway: 7.0 m Coordinates :22°10'27.49" N,076°05'08.48"E	RW-112 to RW-113: Carriageway: 7.2 m Coordinates :22°10'29.22" N,076°04'50.75"E
	
RW-113 to RW-114: Carriageway: 9.2 m Coordinates :22°10'30.21" N,076°04'33.14"E	RW-114 to RW-115: Carriageway: 7.0 m Coordinates :22°10'31.43" N,076°04'29.91"E
	
RW-115 to RW-116: Carriageway: 7.6 m Coordinates :22°10'30.91" N,076°04'28.46"E	RW-116 to RW-117: Carriageway: 15.0 m Coordinates :22°10'25.59" N, 076°04'23.49"E
	

RW-118 to RW-119: Carriageway: 7.0 m Coordinates :22°03'17.68" N,076°32'55.85"E 	RW-119 to RW-120: Carriageway: 5.7 m Coordinates :22°03'19.83" N,076°32'48.87"E 
RW-120 to RW-121: Carriageway: 5.0 m Coordinates :22°03'21.12" N,076°32'47.95"E 	RW-121 to RW-122: Carriageway: 6.1 m Coordinates :22°03'35.14" N,076°32'40.94"E 
RW-122 to RW-123: Carriageway: 6.3 m Coordinates :22°03'41.34" N,076°32'38.58"E 	RW-123 to RW-124: Carriageway: 7.0 m Coordinates :22°04'00.81" N,076°31'33.31"E 

RW-124 to RW-72: Carriageway: 7.0 m Coordinates :22°04'25.71" N,076°30'05.18"E	RW-125 to RW-126: Carriageway: 7.0 m Coordinates :21°27'07.57" N,076°23'35.11"E
	
RW-126 to RW-127: Carriageway: 6.0 m Coordinates :21°27'08.65" N,076°23'33.46"E	RW-127 to RW-128: Carriageway: 14.3 m Coordinates :21°27'15.44" N,076°23'27.32"E
	
RW-128 to RW-129: Carriageway: 8.0 m Coordinates :21°27'11.93" N,076°23'12.92"E	RW-129 to RW-130: Carriageway: 5.1 m Coordinates :21°27'08.04" N,076°23'06.46"E
	

RW-130 to RW-131: Carriageway: 5.6 m Coordinates :21°25'58.79"" N,76°19'29.30""E	RW-131 to RW-132: Carriageway: 2.3 m Coordinates :21°25'56.26" N,076°19'22.09"E
	
RW-132 to RW-133: Carriageway: 5.0 m Coordinates :21°26'48.16" N,076°18'14.36"E	RW-133 to RW-134: Carriageway: 2.5 m Coordinates :21°26'49.39" N,076°18'05.25"E
	
RW-134 to RW-135: Carriageway: 5.5 m Coordinates :21°27'18.66" N,076°16'58.89"E	RW-135 to RW-136: Carriageway: 8.5 m Coordinates :21°27'23.26" N,076°16'54.35"E
	

RW-136 to RW-137: Carriageway: 7.0 m Coordinates :21°27'24.55" N,076°16'54.83"E	RW-137 to RW-138: Carriageway: 6.7 m Coordinates :21°27'45.33" N,076°16'52.77"E
	
RW-138 to RW-139: Carriageway: 6.2 m Coordinates :21°28'07.45" N,076°16'51.9"E	RW-139 to RW-140: Carriageway: 6.7 m Coordinates :21°30'14.00" N,076°18'11.55"E
	
RW-140 to RW-141: Carriageway: 7.0 m Coordinates :21°33'49.04" N,076°18'37.27"E	RW-141 to RW-142: Carriageway: 6.7 m Coordinates :21°36'29.63" N,076°19'30.03"E
	

RW-142 to RW-143: Carriageway: 6.5 m Coordinates :21°36'52.84" N,076°19'36.85"E	RW-143 to RW-144: Carriageway: 7.0 m Coordinates :21°38'11.43" N,076°19'19.95"E
	
RW-144 to RW-145: Carriageway: 4.7 m Coordinates :21°38'17.57" N,076°19'16.96"E	RW-145 to RW-146: Carriageway: 7.0 m Coordinates :21°39'36.82" N,076°18'22.33"E
	
RW-146 to RW-147: Carriageway: 7.0 m Coordinates :21°41'52.61" N,076°16'39.1"E	RW-147 to RW-148: Carriageway: 6.6 m Coordinates :21°42'09.21" N,076°16'11.05"E
	

RW-148 to RW-149: Carriageway: 6.7 m Coordinates :21°43'36.17" N,076°15'35.48"E	RW-149 to RW-150: Carriageway: 7.0 m Coordinates :21°43'45.94" N,076°15'32.06"E
	
RW-150 to RW-151: Carriageway: 7.2 m Coordinates :21°44'38.82" N,076°15'18.20"E	RW-151 to RW-152: Carriageway: 7.2 m Coordinates :21°47'53.38" N,076°14'06.43"E
	
RW-152 to RW-153: Carriageway: 7.3 m Coordinates :21°49'17.88" N,076°13'24.9"E	RW-153 to RW-154: Carriageway: 7.1 m Coordinates :21°49'44.86" N,076°13'05.86"E
	

RW-154 to RW-155: Carriageway: 8.6 m Coordinates :21°49'49.24" N,76°13'03.96"E 	RW-155 to RW-156: Carriageway: 7.2 m Coordinates :21°51'34.17" N,76°11'55.69"E 
RW-156 to RW-157: Carriageway: 7.8 m Coordinates :21°59'25.06"N,76°09'18.55"E 	RW-157 to RW-158: Carriageway: 7.6 m Coordinates :22°00'55.68" N,76°08'35.33"E 
RW-158 to RW-159: Carriageway: 7.1 m Coordinates :22°05'00.54" N,76°07'09.17"E 	RW-159 to RW-160: Carriageway: 7.3 m Coordinates :22°07'19.62" N,76°06'10.87"E 

RW-160 to RW-161: Carriageway: 7.0 m Coordinates :22°09'11.04" N,76°05'06.54"E 	RW-161 to RW-162: Carriageway: 7.0 m Coordinates :22°10'01.95" N,76°04'21.58"E 
RW-162 to RW-35: Carriageway: 7.5 m Coordinates :22°10'09.90" N,76°04'21.44"E 	RW-163 to RW-164: Carriageway: 8.4 m Coordinates :21°48'54.22" N,076°20'38.91" E 
RW-164 to RW-165: Carriageway: 11.0 m Coordinates :21°48'58.26" N,076°20'36.06"E 	RW-165 to RW-166: Carriageway: 15.3 m Coordinates :21°48'58.77" N,76°20'36.04"E 

RW-166 to RW-167: Carriageway: 10.2 m Coordinates :21°49'30.55" N,76°19'32.84"E 	RW-167 to RW-168: Carriageway: 10 m Coordinates :21°49'30.18" N,76°19'28.31"E 
RW-168 to RW-169: Carriageway: 10 m Coordinates :21°49'27.43" N,76°17'47.82"E 	RW-169 to RW-155: Carriageway: 10 m Coordinates :21°49'09.70" N,76°14'53.77"E 

PHOTOGRAPHS OF CENSUS POINT LOCATIONS

CP-01: Near Katora village (On Katora to Plant road) Carriageway: 7m Coordinates: 22°07'33.04"N, 75°51'48.76"E 	CP-02: Near Katora village (On Katora to Beriya road) Carriageway: 7m Coordinates: 22°07'46.13"N, 75°52'02.56"E 
CP-03: Near Kheri Buzurg Carriageway: 6m Coordinates: 22°03'02.60"N, 75°52'36.77"E 	CP-04: Near Roriya village Carriageway: 7m Coordinates: 22°00'30.43"N, 75°54'31.57"E 
CP-05: Near Bagda Buzurg (On Rodia to Bedia road), Carriageway: 7.1m Coordinates: 22°05'18.88"N, 75°56'58.80"E 	CP-06: Near Beriya village Carriageway: 7m Coordinates : 22°06'22.84"N, 75°57'28.56"E 

CP-07: Near Issar pump, Barud Carriageway: 7m Coordinates : 22°09'23.72"N, 76°01'06.23"E	CP-08: Near Barud village Carriageway: 8.6m Coordinates : 22°09'49.26"N, 76°02'07.49"E
	
CP-09: Sanawad by-pass Carriageway: 7m Coordinates : 22°10'57.33"N, 76°03'53.57"E	CP-10: Near Indian Oil Pump, Sanawad Carriageway: 7 m Coordinates : 22°10'43.89"N, 76°04'14.29"E
	
CP-11: Near Railway crossing, Sanawad Carriageway: 7.6 m Coordinates : 22°10'30.99"N, 76°04'28.75"E	CP-12: Near Dhauli Mohalla, Sanawad Carriageway: 7.2m Coordinates : 22°10'31.86"N, 76°05'02.40"E
	

CP-13: Near Sulgaon Village Carriageway: 7.2m Coordinates : 22°08'46.08"N, 76°08'56.12"E 	CP-14: Near Mundi, Singhaji Plant road Carriageway: 8m Coordinates : 22°04'28.26"N, 76°30'07.63"E 
CP-15: Near Devla village Carriageway: 5.6m Coordinates : 22°07'22.72"N, 76°21'21.96"E 	CP-16: Near River Bridge at Sanawad Carriageway: 7.5m Coordinates : 22°10'05.82"N, 76°04'19.13"E 
CP-17: Near Dhakalgaon village Carriageway: 3.1m Coordinates : 22°07'22.96"N, 76°03'50.52"E 	CP-18: Near Dhangaon Village Carriageway: 7.3m Coordinates : 22°05'07.79"N, 76°07'07.74"E 

CP-19: Near Deshgaon Village Carriageway: 7.8m Coordinates : 21°54'17.35"N, 76°10'45.79"E	CP-20: Near Jain Dhaba, Chhaigaon Makhan Village Carriageway: 7.2m Coordinates : 21°50'34.54"N, 76°12'34.75"E
	
CP-21: Near Police station, Chhaigaon Makhan village Carriageway: 7.1m Coordinates : 21°49'27.61"N, 76°13'16.39"E	CP-22: Near Borgaon Village Carriageway: 7m Coordinates : 21°37'13.39"N, 76°19'32.85"E
	
CP-23: Near Asir village Carriageway: 8.5m Coordinates : 21°27'23.27"N, 76°16'54.59"E	CP-24: Nepanagar (on SH27 to Nepanagar road) Carriageway: 5.1m Coordinates : 21°37'11.11"N, 76°23'12.17"E
	

CP-25: Near Bus Stand, Neapanagar Carriageway: 6m Coordinates : 21°27'07.61"N, 76°23'34.88E	CP-26: Near Chhaigaon Makhan Village on Khandwa road Carriageway: 10m Coordinates : 21°49'46.74"N, 76°13'07.45"E
	
CP-27 Near Khandwa goods yard Carriageway: 8.4m Coordinates : 21°48'55.46"N, 76°20'35.37"E	
	

TRAFFIC VOLUME MONITORED IN NOVEMBER-DECEMBER 2018

CENSUS POINT NO.	Particular	Location		Cycles	Motor Cycles & Scooters	LMV	Buses	Trucks	Animal Drawn vehicles	Others	Total
		Equivalency factor		0.5	0.5	1	3	3	8	4.5	
CP-01	Total in 24 hr	Near Katora village (Katora to Plan road) (Up)	Observed count	53	485	353	18	659	39	19	1626
			Equivalent PCU	26.5	242.5	353	54	1977	312	85.5	3050.5
		Near Katora village (Katora to Plan road) (Down)	Observed count	101	647	448	28	651	27	7	1909
			Equivalent PCU	50.5	324	448	84	1953	216	32	3107.5
		Near Katora village (Katora to Plan road)	Total (Up+Down) of Equivalent PCU	77	566.5	801	138	3930	528	117.5	6158
CP-02	Total in 24 hr	Near Katora village (Katora to Beriya road) (Up)	Observed count	21	342	234	46	577	0	3	1223
			Equivalent PCU	10.5	171	234	138	1731	0	13.5	2298
		Near Katora village (Katora to Beriya road) (Down)	Observed count	10	446	294	43	538	16	4	1351
			Equivalent PCU	5	223	294	129	1614	128	18	2411
		Near Katora village (Katora to Beriya road)	Total (Up+Down) of Equivalent PCU	15.5	394	528	267	3345	128	31.5	4709
CP-03	Total in 24 hr	Near Kheri Buzurg (Up)	Observed count	39	708	139	56	116	34	0	1092
			Equivalent PCU	19.5	354	139	168	348	272	0	1300.5
		Near Kheri Buzurg (Down)	Observed count	36	853	130	22	175	35	0	1251
			Equivalent PCU	18	427	130	66	525	280	0	1446
		Near Kheri Buzurg	Total (Up+Down) of Equivalent PCU	37.5	781	269	234	873	552	0	2747
CP-04	Total in 24 hr	Near Roriya village (Up)	Observed count	11	751	93	17	142	21	0	1035
			Equivalent PCU	5.5	375.5	93	51	426	168	0	1119
		Near Roriya village (Down)	Observed count	9	621	85	12	127	15	0	869
			Equivalent PCU	4.5	311	85	36	381	120	0	937.5
		Near Roriya village	Total (Up+Down) of Equivalent PCU	10	686.5	178	87	807	288	0	2057
CP-05	Total in 24 hr	Near Bagda Buzurg (Rodia to Bedia road) (Up)	Observed count	9	2015	382	77	130	4	29	2646
			Equivalent PCU	4.5	1007.5	382	231	390	32	130.5	2177.5
		Near Bagda Buzurg (Rodia to Bedia road) (Down)	Observed count	3	1728	361	89	163	9	33	2386
			Equivalent PCU	1.5	864	361	267	489	72	148.5	2203
		Near Bagda Buzurg (Rodia to Bedia road)	Total (Up+Down) of Equivalent PCU	6	1871.5	743	498	879	104	279	4381

CENSUS POINT NO.	Particular	Location		Cycles	Motor Cycles & Scooters	LMV	Buses	Trucks	Animal Drawn vehicles	Others	Total
CP-06	Total in 24 hr	Near Beriya village (Up)	Observed count	0	2038	219	86	186	45	51	2625
			Equivalent PCU	0	1019	219	258	558	360	229.5	2643.5
		Near Beriya village (Down)	Observed count	0	2141	264	103	152	28	67	2755
			Equivalent PCU	0	1071	264	309	456	224	302	2626
		Near Beriya village	Total (Up+Down) of Equivalent PCU	0	2090	483	567	1014	584	531.5	5270
CP-07	Total in 24 hr	Near Issar pump, Barud (Up)	Observed count	16	2088	646	129	157	19	72	3127
			Equivalent PCU	8	1044	646	387	471	152	324	3032
		Near Issar pump, Barud (Down)	Observed count	10	2338	571	101	140	15	68	3243
			Equivalent PCU	5	1169	571	303	420	120	306	2894
		Near Issar pump, Barud	Total (Up+Down) of Equivalent PCU	13	2213	1217	690	891	272	630	5926
CP-08	Total in 24 hr	Near Barud village (Up)	Observed count	47	3310	1153	144	178	22	94	4948
			Equivalent PCU	23.5	1655	1153	432	534	176	423	4396.5
		Near Barud village (Down)	Observed count	74	4097	706	122	186	15	78	5278
			Equivalent PCU	37	2049	706	366	558	120	351	4187
		Near Barud village	Total (Up+Down) of Equivalent PCU	60.5	3704	1859	798	1092	296	774	8584
CP-09	Total in 24 hr	Sanawad by-pass (Up)	Observed count	149	1093	368	77	288	15	64	2054
			Equivalent PCU	74.5	546.5	368	231	864	120	288	2492
		Sanawad by-pass (Down)	Observed count	132	1043	461	65	269	13	49	2032
			Equivalent PCU	66	522	461	195	807	104	221	2376
		Sanawad by-pass	Total (Up+Down) of Equivalent PCU	140.5	1068.5	829	426	1671	224	509	4868
	Max in 1 hour (7:00-8:00AM)	Sanawad by-pass (Up to Down)	Maximum Observed count	82	141	92	8	33	1	5	362
			Equivalent PCU/hr for Urban Road	0.5	0.75	2	2.2	2.2	1.5	4	
			Equivalent PCU (Up+Down)	41	105.75	184	17.6	72.6	1.5	20	442

CENSUS POINT NO.	Particular	Location		Cycles	Motor Cycles & Scooters	LMV	Buses	Trucks	Animal Drawn vehicles	Others	Total
CP-10	Total in 24 hr	Near Indian Oil Pump, Sanawad (Up)	Observed count	44	5093	2369	655	1311	14	313	9799
			Equivalent PCU	22	2546.5	2369	1965	3933	112	1408.5	12356
		Near Indian Oil Pump, Sanawad (Down)	Observed count	21	4030	2093	442	1713	5	99	8403
			Equivalent PCU	10.5	2015	2093	1326	5139	40	446	11069.5
		Near Indian Oil Pump, Sanawad	Total (Up+Down) of Equivalent PCU	32.5	4561.5	4462	3291	9072	152	1854.5	23426
	Max in 1 hour (12:00-1:00PM)	Near Indian Oil Pump, Sanawad (Up to Down)	Maximum Observed count	3	1022	497	90	195	2	59	1868
			Equivalent PCU/hr for Urban Road	0.4	0.75	2	2.2	3.7	1.5	4	
			Equivalent PCU (Up+Down)	1.2	766.5	994	198	721.5	3	236	2920
CP-11	Total in 24 hr	Near Railway crossing, Sanawad (Up)	Observed count	185	6320	1329	156	129	21	76	8216
			Equivalent PCU	92.5	3160	1329	468	387	168	342	5946.5
		Near Railway crossing, Sanawad (Down)	Observed count	286	6179	1087	92	118	29	58	7849
			Equivalent PCU	143	3090	1087	276	354	232	261	5443
		Near Railway crossing, Sanawad	Total (Up+Down) of Equivalent PCU	235.5	6250	2416	744	741	400	603	11390
	Max in 1 hour (4:00-5:00PM)	Near Railway crossing, Sanawad (Up to Down)	Maximum Observed count	47	1433	314	15	14	3	14	1840
			Equivalent PCU/hr for Urban Road	0.4	0.75	2	2.2	2.2	1.5	4	
			Equivalent PCU (Up+Down)	18.8	1074.75	628	33	30.8	4.5	56	1846
CP-12	Total in 24 hr	Near Dhauli Mohalla, Sanawad (Up)	Observed count	15	3777	548	94	84	22	115	4655
			Equivalent PCU	7.5	1888.5	548	282	252	176	517.5	3671.5
		Near Dhauli Mohalla, Sanawad (Down)	Observed count	15	3599	556	81	85	33	112	4481
			Equivalent PCU	7.5	1800	556	243	255	264	504	3629.5
		Near Dhauli Mohalla, Sanawad	Total (Up+Down) of Equivalent PCU	15	3688.5	1104	525	507	440	1021.5	7301
	Max in 1 hour (2:00-3:00PM)	Near Dhauli Mohalla, Sanawad (Up to Down)	Maximum Observed count	2	738	115	11	2	0	8	876
			Equivalent PCU/hr for Urban Road	0.4	0.75	2	2.2	2.2	1.5	4	
			Equivalent PCU (Up+Down)	0.8	553.5	230	24.2	4.4	0	32	845

CENSUS POINT NO.	Particular	Location		Cycles	Motor Cycles & Scooters	LMV	Buses	Trucks	Animal Drawn vehicles	Others	Total
CP-13	Total in 24 hr	Near Sulgaon Village (Up)	Observed count	21	1131	347	79	199	3	13	1793
			Equivalent PCU	10.5	565.5	347	237	597	24	58.5	1839.5
		Near Sulgaon Village (Down)	Observed count	16	1078	304	100	179	33	31	1741
			Equivalent PCU	8	539	304	300	537	264	140	2092
		Near Sulgaon Village	Total (Up+Down) of Equivalent PCU	18.5	1104.5	651	537	1134	288	198.5	3932
CP-14	Total in 24 hr	Near Mundi, Singha Ji Plant road (Up)	Observed count	86	1119	251	20	110	44	33	1663
			Equivalent PCU	43	559.5	251	60	330	352	148.5	1744
		Near Mundi, Singha Ji Plant road (Down)	Observed count	37	963	361	19	150	40	59	1629
			Equivalent PCU	18.5	482	361	57	450	320	266	1954.5
		Near Mundi, Singha Ji Plant road	Total (Up+Down) of Equivalent PCU	61.5	1041.5	612	117	780	672	414.5	3699
CP-15	Total in 24 hr	Near Devlan village (Up)	Observed count	35	909	308	25	91	34	60	1462
			Equivalent PCU	17.5	454.5	308	75	273	272	270	1670
		Near Devlan village (Down)	Observed count	19	949	156	22	99	26	54	1325
			Equivalent PCU	9.5	475	156	66	297	208	243	1454.5
		Near Devlan village	Total (Up+Down) of Equivalent PCU	27	929.5	464	141	570	480	513	3125
CP-16	Total in 24 hr	Near River Bridge at Sanawad (Up)	Observed count	12	4025	1265	278	989	37	191	6797
			Equivalent PCU	6	2012.5	1265	834	2967	296	859.5	8240
		Near River Bridge at Sanawad (Down)	Observed count	43	3897	1278	387	1378	29	85	7097
			Equivalent PCU	21.5	1949	1278	1161	4134	232	383	9158.5
		Near River Bridge at Sanawad	Total (Up+Down) of Equivalent PCU	27.5	3961.5	2543	1995	7101	528	1242.5	17399
	Max in 1 hour (3:00-4:00PM)	Near River Bridge at Sanawad (Up to Down)	Maximum Observed count	0	787	239	40	165	10	47	1288
			Equivalent PCU/hr for Urban Road	0.4	0.75	2	2.2	3.7	1.5	4	
			Equivalent PCU (Up+Down)	0	590.25	478	88	610.5	15	188	1970

CENSUS POINT NO.	Particular	Location		Cycles	Motor Cycles & Scooters	LMV	Buses	Trucks	Animal Drawn vehicles	Others	Total
CP-17	Total in 24 hr	Near Dhakalgaon village (Up)	Observed count	28	887	192	60	238	61	76	1542
			Equivalent PCU	14	443.5	192	180	714	488	342	2373.5
		Near Dhakalgaon village (Down)	Observed count	41	896	158	58	174	75	78	1480
			Equivalent PCU	20.5	448	158	174	522	600	351	2273.5
		Near Dhakalgaon village	Total (Up+Down) of Equivalent PCU	34.5	891.5	350	354	1236	1088	693	4647
CP-18	Total in 24 hr	Near Dhangaon Village (Up)	Observed count	11	1728	956	222	1323	64	63	4367
			Equivalent PCU	5.5	864	956	666	3969	512	283.5	7256
		Near Dhangaon Village (Down)	Observed count	22	1455	916	192	1555	26	53	4219
			Equivalent PCU	11	728	916	576	4665	208	239	7343
		Near Dhangaon Village	Total (Up+Down) of Equivalent PCU	16.5	1592	1872	1242	8634	720	522.5	14599
CP-19	Total in 24 hr	Near Deshgaon Village (Up)	Observed count	0	1559	903	187	1047	0	77	3773
			Equivalent PCU	0	779.5	903	561	3141	0	346.5	5731
		Near Deshgaon Village (Down)	Observed count	0	1567	878	161	1286	3	70	3965
			Equivalent PCU	0	784	878	483	3858	24	315	6342
		Near Deshgaon Village	Total (Up+Down) of Equivalent PCU	0	1563.5	1781	1044	6999	24	661.5	12073
CP-20	Total in 24 hr	Near jain Dhaba, Chhaigaon Makhan Village (Up)	Observed count	0	2713	1233	277	1794	1	69	6087
			Equivalent PCU	0	1356.5	1233	831	5382	8	310.5	9121
		Near jain Dhaba, Chhaigaon Makhan Village (Down)	Observed count	39	2867	1197	249	1887	2	78	6319
			Equivalent PCU	19.5	1434	1197	747	5661	16	351	9425.5
		Near jain Dhaba, Chhaigaon Makhan Village	Total (Up+Down) of Equivalent PCU	19.5	2790.5	2430	1578	11043	24	661.5	18547
CP-21	Total in 24 hr	Near Police station, Chhaigaon Makhan village (Up)	Observed count	44	1314	832	48	1705	4	15	3962
			Equivalent PCU	22	657	832	144	5115	32	67.5	6869.5
		Near Police station, Chhaigaon Makhan village (Down)	Observed count	18	1337	581	33	1738	6	23	3736
			Equivalent PCU	9	669	581	99	5214	48	104	6724
		Near Police station, Chhaigaon Makhan village	Total (Up+Down) of Equivalent PCU	31	1326	1413	243	10329	80	171.5	13594

CENSUS POINT NO.	Particular	Location		Cycles	Motor Cycles & Scooters	LMV	Buses	Trucks	Animal Drawn vehicles	Others	Total
CP-22	Total in 24 hr	Near Borgaon Village (Up)	Observed count	26	953	622	130	1751	21	88	3591
			Equivalent PCU	13	476.5	622	390	5253	168	396	7318.5
		Near Borgaon Village (Down)	Observed count	33	755	563	104	1742	14	40	3251
			Equivalent PCU	16.5	378	563	312	5226	112	180	6787.5
		Near Borgaon Village	Total (Up+Down) of Equivalent PCU	29.5	854.5	1185	702	10479	280	576	14106
CP-23	Total in 24 hr	Near Asir village (Up)	Observed count	5	1070	696	152	1812	0	17	3752
			Equivalent PCU	2.5	535	696	456	5436	0	76.5	7202
		Near Asir village (Down)	Observed count	10	785	733	178	1970	2	29	3707
			Equivalent PCU	5	393	733	534	5910	16	131	7722
		Near Asir village	Total (Up+Down) of Equivalent PCU	7.5	928	1429	990	11346	16	207.5	14924
CP-24	Total in 24 hr	Nepanagar (on SH27 to Nepanagar road) (Up)	Observed count	14	641	230	23	190	1	40	1139
			Equivalent PCU	7	320.5	230	69	570	8	180	1384.5
		Nepanagar (on SH27 to Nepanagar road) (Down)	Observed count	8	558	146	18	191	2	25	948
			Equivalent PCU	4	279	146	54	573	16	113	1185
		Nepanagar (on SH27 to Nepanagar road)	Total (Up+Down) of Equivalent PCU	11	599.5	376	123	1143	24	293	2570
	Max in 1 hour (1:00-2:00PM)	Nepanagar (on SH27 to Nepanagar road) (Up to Down)	Maximum Observed count	0	139	22	1	11	0	7	180
			Equivalent PCU/hr for Urban Road	0.4	0.75	2	2.2	2.2	1.5	4	
			Equivalent PCU (Up+Down)	0	104.25	44	2.2	24.2	0	28	203
CP-25	Total in 24 hr	Near Bus Stand, Nepanagar (Up)	Observed count	42	779	519	6	118	25	1	1490
			Equivalent PCU	21	389.5	519	18	354	200	4.5	1506
		Near Bus Stand, Nepanagar (Down)	Observed count	102	874	526	11	88	12	1	1614
			Equivalent PCU	51	437	526	33	264	96	5	1412
		Near Bus Stand, Nepanagar	Total (Up+Down) of Equivalent PCU	72	826.5	1045	51	618	296	9.5	2918
	Max in 1 hour (5:00-6:00PM)	Near Bus Stand, Nepanagar (Up to Down)	Maximum Observed count	23	132	100	0	12	6	0	273
			Equivalent PCU/hr for Urban Road	0.4	0.75	2	2.2	2.2	1.5	4	
			Equivalent PCU (Up+Down)	9.2	99	200	0	26.4	9	0	344

CENSUS POINT NO.	Particular	Location		Cycles	Motor Cycles & Scooters	LMV	Buses	Trucks	Animal Drawn vehicles	Others	Total
CP-26	Total in 24 hr	Near Chhaigaon Makhan Village on Khandwa road (Up)	Observed count	8	2086	1222	253	615	1	98	4283
			Equivalent PCU	4	1043	1222	759	1845	8	441	5322
		Near Chhaigaon Makhan Village on Khandwa road (Down)	Observed count	8	2168	931	264	542	2	101	4016
			Equivalent PCU	4	1084	931	792	1626	16	455	4908
		Near Chhaigaon Makhan Village on Khandwa road	Total (Up+Down) of Equivalent PCU	8	2127	2153	1551	3471	24	896	10230
CP-27	Total in 24 hr	Near Khandwa railway goods yard (Up)	Observed count	43	3155	713	134	533	12	103	4693
			Equivalent PCU	21.5	1577.5	713	402	1599	96	463.5	4872.5
		Near Khandwa railway goods yard (Down)	Observed count	59	3366	1401	126	1127	9	331	6419
			Equivalent PCU	29.5	1683	1401	378	3381	72	1490	8434.5
		Near Khandwa railway goods yard	Total (Up+Down) of Equivalent PCU	51	3260.5	2114	780	4980	168	1953.5	13307
	Max in 1 hour (6:00-7:00PM)	Near Khandwa railway goods yard (Up to Down)	Maximum Observed count	0	716	206	16	77	0	31	1046
			Equivalent PCU/hr for Urban Road	0.4	0.75	2	2.2	2.2	1.5	4	
			Equivalent PCU (Up+Down)	0	537	412	35.2	169.4	0	124	1278

AIR QUALITY PREDICTION MODELLING

CALINE4 : CALIFORNIA LINE SOURCE DISPERSION MODEL - VERSION 2.1, DATED JUNE 1989

RUN: RURAL HIGHWAY

I. SITE VARIABLES

U= 0.7 M/S Z0= 10. CM ALT= 0. (M) BRG= 45.0 DEGREES VD= 0.0 CM/S CLAS= 1 (A) VS= 0.0 CM/S
MIXH= 525. M AMB= 0.0 PPM SIGTH= 10. DEGREES TEMP= 14.7 DEGREE (C)

II. LINK VARIABLES

The coal will be transported by RD trucks with coal carrying capacity of 20 T. The total number of trucks has been calculated for 2000 TPD from any of the route is as given below:

	NAME OF MINES	COAL (TPD)	TRUCK CAPACITY (T)	WORKING HOURS	HOURLY MOVEMENT OF TRUCKS (TO & FRO)
1	Bedia Siding	2000	20	24	9
2	Dakalgaon Siding	2000	20	16	13
3	Singaji Siding	2000	20	16	13
4	Bir Siding	2000	20	16	13
5	Nepanagar Siding	2000	20	16	13
6	Khandwa Goods & Yard	2000	20	16	13

These trucks will travel through the routes shown below in transportation route map which is divided into 35 sections (S1 to S35) for modelling as shown in Fig 1. The modelling was carried out for all 35 sections initially with following data:

ADOPTING WORST CASE SCENARIO			
	S1-S4	S5-S12	S1-S24
Trucks/hr	9	13	13
PM ₁₀	0.9550	0.9550	0.9550 g/mile
PM _{2.5}	0.2671	0.2671	0.2671 g/mile
SO ₂	2.6913	2.6913	2.6913 g/mile
NO _x	18.9392	18.9392	18.9392 g/mile

The mode has been set CO for calculating SO₂ concentrations.

FIG 1: RECEPTOR MAP



SOURCE DATA

Section	Link	LINK COORDINATES (M)				TYPE	VPH**	EF (G/MI)				H (M)	W (M)
		X1	Y1	X2	Y2			PM ₁₀	PM _{2.5}	SO ₂	NO _x		
S01	A.	12293	78161	12834	78343	AG	900	1.0	0.3	26.9	18.9	0	10
	B.	12834	78343	13049	77154	AG	900	1.0	0.3	26.9	18.9	0	10
	C.	13049	77154	12573	76062	AG	900	1.0	0.3	26.9	18.9	0	10
	D.	12573	76062	12814	75294	AG	900	1.0	0.3	26.9	18.9	0	10
	E.	12814	75294	12573	73915	AG	900	1.0	0.3	26.9	18.9	0	10
	F.	12573	73915	12090	73552	AG	900	1.0	0.3	26.9	18.9	0	10
	G.	12090	73552	12181	72688	AG	900	1.0	0.3	26.9	18.9	0	10
	H.	12181	72688	11956	72012	AG	900	1.0	0.3	26.9	18.9	0	10
S02	A.	11956	72012	10559	70330	AG	900	1.0	0.3	26.9	18.9	0	10
	B.	10559	70330	9031	69175	AG	900	1.0	0.3	26.9	18.9	0	10
	C.	9031	69175	8648	68737	AG	900	1.0	0.3	26.9	18.9	0	10
	D.	8648	68737	7939	69422	AG	900	1.0	0.3	26.9	18.9	0	10
	E.	7939	69422	8118	70294	AG	900	1.0	0.3	26.9	18.9	0	10
	F.	8118	70294	6309	72156	AG	900	1.0	0.3	26.9	18.9	0	10
	G.	6309	72156	5923	72300	AG	900	1.0	0.3	26.9	18.9	0	10
	H.	5923	72300	5849	72835	AG	900	1.0	0.3	26.9	18.9	0	10
S03	A.	5849	72835	5587	73093	AG	900	1.0	0.3	26.9	18.9	0	10
	B.	5587	73093	5557	73411	AG	900	1.0	0.3	26.9	18.9	0	10
	C.	5557	73411	5311	73353	AG	900	1.0	0.3	26.9	18.9	0	10
	D.	5311	73353	5208	73667	AG	900	1.0	0.3	26.9	18.9	0	10
	E.	5208	73667	5399	73756	AG	900	1.0	0.3	26.9	18.9	0	10
	F.	5399	73756	4803	74941	AG	900	1.0	0.3	26.9	18.9	0	10
	G.	4803	74941	4876	75332	AG	900	1.0	0.3	26.9	18.9	0	10
	H.	4876	75332	4680	75337	AG	900	1.0	0.3	26.9	18.9	0	10
S04	A.	4680	75337	4686	75445	AG	900	1.0	0.3	26.9	18.9	0	10
	B.	4686	75445	4334	75412	AG	900	1.0	0.3	26.9	18.9	0	10
	C.	4334	75412	4339	76130	AG	900	1.0	0.3	26.9	18.9	0	10
	D.	4339	76130	3983	76134	AG	900	1.0	0.3	26.9	18.9	0	10
S05	A.	3983	76134	3257	76139	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	3257	76139	3157	76097	AG	1300	1.0	0.3	26.9	18.9	0	10
S06	A.	24540	81312	24319	81949	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	24319	81949	24902	84206	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	24902	84206	24928	84931	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	24928	84931	25207	85879	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	25207	85879	25235	87321	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	25235	87321	25422	88031	AG	1300	1.0	0.3	26.9	18.9	0	10
S07	A.	25422	88031	25338	88139	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	25338	88139	25427	88301	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	25427	88301	25666	88385	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	25666	88385	25659	88481	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	25659	88481	25477	88778	AG	1300	1.0	0.3	26.9	18.9	0	10
S08	A.	25477	88778	24987	89942	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	24987	89942	24419	89733	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	24419	89733	24214	89121	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	24214	89121	24367	88296	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	24367	88296	21436	87507	AG	1300	1.0	0.3	26.9	18.9	0	10

ANNEXURE : 6 Contd..

Section	Link	LINK COORDINATES (M)				TYPE	VPH**	EF (G/MI)				H (M)	W (M)
		X1	Y1	X2	Y2			PM ₁₀	PM _{2.5}	SO ₂	NO _x		
S09	F.	21436	87507	21269	87838	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	21269	87838	20694	88237	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	20694	88237	20651	87778	AG	1300	1.0	0.3	26.9	18.9	0	10
	A.	20651	87778	20904	87698	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	20904	87698	20911	87504	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	20911	87504	19495	86491	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	19495	86491	19229	86008	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	19229	86008	18571	85556	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	18571	85556	17913	84738	AG	1300	1.0	0.3	26.9	18.9	0	10
S10	G.	17913	84738	15432	82947	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	15432	82947	14780	81891	AG	1300	1.0	0.3	26.9	18.9	0	10
	A.	14780	81891	12962	80049	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	12962	80049	9910	81957	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	9910	81957	9697	82313	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	9697	82313	9049	82588	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	9049	82588	8574	82547	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	8574	82547	7164	82875	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	7164	82875	6701	82758	AG	1300	1.0	0.3	26.9	18.9	0	10
S11	H.	6701	82758	5510	82968	AG	1300	1.0	0.3	26.9	18.9	0	10
	A.	5510	82968	4344	83541	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	4344	83541	3821	83393	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	3821	83393	4813	80444	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	4813	80444	4934	80077	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	4934	80077	4832	78916	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	4832	78916	4487	78350	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	4487	78350	4326	77928	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	4326	77928	4341	77612	AG	1300	1.0	0.3	26.9	18.9	0	10
S12	A.	4341	77612	4182	77325	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	4182	77325	4292	76962	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	4292	76962	4003	76923	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	4003	76923	3983	76134	AG	1300	1.0	0.3	26.9	18.9	0	10
S13	A.	72297	80456	71784	80599	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	71784	80599	70703	78406	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	70703	78406	70694	77794	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	70694	77794	70218	77443	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	70218	77443	69804	76578	AG	1300	1.0	0.3	26.9	18.9	0	10
S14	A.	74767	74202	74397	74358	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	74397	74358	74124	75131	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	74124	75131	72843	75706	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	72843	75706	71219	75830	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	71219	75830	69804	76578	AG	1300	1.0	0.3	26.9	18.9	0	10
S15	A.	69804	76578	69085	77083	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	69085	77083	68362	77212	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	68362	77212	68559	76414	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	68559	76414	68561	75784	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	68561	75784	66293	76979	AG	1300	1.0	0.3	26.9	18.9	0	11
	F.	66293	76979	63979	77827	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	63979	77827	62508	77766	AG	1300	1.0	0.3	26.9	18.9	0	10

ANNEXURE : 6 Contd..

Section	Link	LINK COORDINATES (M)				TYPE	VPH**	EF (G/MI)				H (M)	W (M)
		X1	Y1	X2	Y2			PM ₁₀	PM _{2.5}	SO ₂	NO _x		
	H.	62508	77766	61694	78078	AG	1300	1.0	0.3	26.9	18.9	0	10
S16	A.	61694	78078	60649	78570	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	60649	78570	60198	78985	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	60198	78985	59779	79052	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	59779	79052	58975	79935	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	58975	79935	57653	80302	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	57653	80302	57658	80581	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	57658	80581	57396	80859	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	57396	80859	56885	80935	AG	1300	1.0	0.3	26.9	18.9	0	10
S17	A.	56885	80935	55503	82154	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	55503	82154	54135	82876	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	54135	82876	53284	84042	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	53284	84042	53159	84573	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	53159	84573	52007	84749	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	52007	84749	50452	84001	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	50452	84001	50027	83706	AG	1300	1.0	0.3	26.9	18.9	0	10
S18	A.	50027	83706	48803	83324	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	48803	83324	48138	82764	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	48138	82764	47293	82422	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	47293	82422	46879	82052	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	46879	82052	46549	81934	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	46549	81934	46533	81730	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	46533	81730	46006	81498	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	46006	81498	46002	81836	AG	1300	1.0	0.3	26.9	18.9	0	10
S19	A.	46002	81836	44414	83460	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	44414	83460	43246	83780	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	43246	83780	42117	83731	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	42117	83731	41084	84043	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	41084	84043	40908	84266	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	40908	84266	39324	84886	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	39324	84886	39089	84812	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	39089	84812	38688	84955	AG	1300	1.0	0.3	26.9	18.9	0	10
S20	A.	38688	84955	37940	84933	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	37940	84933	37314	85018	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	37314	85018	36766	84871	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	36766	84871	34877	85256	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	34877	85256	34638	85408	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	34638	85408	33617	85496	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	33617	85496	33245	85349	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	33245	85349	33146	85117	AG	1300	1.0	0.3	26.9	18.9	0	10
S21	A.	33146	85117	32645	85213	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	32645	85213	32197	85469	AG	1300	1.0	0.3	26.9	18.9	0	16
	C.	32197	85469	32231	85876	AG	1300	1.0	0.3	26.9	18.9	0	16
	D.	32231	85876	31622	86828	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	31622	86828	30919	87045	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	30919	87045	30423	87688	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	30423	87688	29569	87922	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	29569	87922	29138	88199	AG	1300	1.0	0.3	26.9	18.9	0	10

ANNEXURE : 6 Contd..

Section	Link	LINK COORDINATES (M)				TYPE	VPH**	EF (G/MI)				H (M)	W (M)
		X1	Y1	X2	Y2			PM ₁₀	PM _{2.5}	SO ₂	NO _x		
S22	A.	29138	88199	28987	88138	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	28987	88138	28518	88511	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	28518	88511	27953	88679	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	27953	88679	27015	88630	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	27015	88630	26597	89054	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	26597	89054	25957	88803	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	25957	88803	25635	88947	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	25635	88947	25477	88778	AG	1300	1.0	0.3	26.9	18.9	0	10
S23	A.	59004	6672	58677	6609	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	58677	6609	58302	7065	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	58302	7065	57775	6870	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	57775	6870	57408	6919	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	57408	6919	56547	6414	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	56547	6414	56396	6475	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	56396	6475	56341	6309	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	56341	6309	54877	5714	AG	1300	1.0	0.3	26.9	18.9	0	10
S24	A.	54877	5714	54221	4218	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	54221	4218	53662	4039	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	53662	4039	52510	4141	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	52510	4141	51625	4751	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	51625	4751	51233	4631	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	51233	4631	50429	5343	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	50429	5343	50224	5772	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	50224	5772	49207	6261	AG	1300	1.0	0.3	26.9	18.9	0	10
S25	A.	49207	6261	48490	6466	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	48490	6466	48018	7102	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	48018	7102	47129	7180	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	47129	7180	46954	7315	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	46954	7315	47100	7549	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	47100	7549	46903	8109	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	46903	8109	46643	8441	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	46643	8441	46877	8562	AG	1300	1.0	0.3	26.9	18.9	0	10
S26	A.	46877	8562	46906	8883	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	46906	8883	47875	10342	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	47875	10342	47879	10749	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	47879	10749	48589	11477	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	48589	11477	49214	12669	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	49214	12669	49228	13115	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	49228	13115	49430	13544	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	49430	13544	49737	13799	AG	1300	1.0	0.3	26.9	18.9	0	10
S27	A.	49737	13799	49499	14633	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	49499	14633	49817	15274	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	49817	15274	50141	17596	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	50141	17596	49907	17948	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	49907	17948	49796	18702	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	49796	18702	50258	20392	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	50258	20392	50600	20608	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	50600	20608	50689	21145	AG	1300	1.0	0.3	26.9	18.9	0	10

ANNEXURE : 6 Contd..

Section	Link	LINK COORDINATES (M)				TYPE	VPH**	EF (G/MI)				H (M)	W (M)
		X1	Y1	X2	Y2			PM ₁₀	PM _{2.5}	SO ₂	NO _x		
S28	A.	50689	21145	50434	21482	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	50434	21482	51049	22462	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	51049	22462	51537	24659	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	51537	24659	51786	25289	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	51786	25289	51503	25572	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	51503	25572	51683	25966	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	51683	25966	51309	27061	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	51309	27061	50450	28499	AG	1300	1.0	0.3	26.9	18.9	0	10
S29	A.	50450	28499	46510	34225	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	46510	34225	45876	34251	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	45876	34251	44400	38260	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	44400	38260	44570	38688	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	44570	38688	44274	38998	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	44274	38998	42058	45585	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	42058	45585	40388	48788	AG	1300	1.0	0.3	26.9	18.9	0	10
S30	A.	40388	48788	37158	54325	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	37158	54325	37182	54696	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	37182	54696	36398	56891	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	36398	56891	36459	57147	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	36459	57147	36216	57542	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	36216	57542	36241	58123	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	36241	58123	35780	58993	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	35780	58993	34411	60791	AG	1300	1.0	0.3	26.9	18.9	0	10
S31	A.	34411	60791	34089	60936	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	34089	60936	33870	61737	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	33870	61737	34203	63534	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	34203	63534	34668	63736	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	34668	63736	34540	64360	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	34540	64360	34301	64747	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	34301	64747	34382	65080	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	34382	65080	34049	66106	AG	1300	1.0	0.3	26.9	18.9	0	10
S32	A.	34049	66106	33415	68824	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	33415	68824	32525	69675	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	32525	69675	32078	69981	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	32078	69981	32038	70741	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	32038	70741	31251	73221	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	31251	73221	31387	73688	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	31387	73688	31200	74616	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	31200	74616	30736	75063	AG	1300	1.0	0.3	26.9	18.9	0	10
S33	A.	30736	75063	30484	76656	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	30484	76656	30044	76967	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	30044	76967	30254	77846	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	30254	77846	30123	78497	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	30123	78497	29041	80276	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	29041	80276	28263	84098	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	28263	84098	25422	88031	AG	1300	1.0	0.3	26.9	18.9	0	10
S34	A.	53522	47146	53417	47182	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	53417	47182	53443	47256	AG	1300	1.0	0.3	26.9	18.9	0	10

ANNEXURE : 6 Contd..

Section	Link	LINK COORDINATES (M)				TYPE	VPH**	EF (G/MI)				H (M)	W (M)
		X1	Y1	X2	Y2			PM ₁₀	PM _{2.5}	SO ₂	NO _x		
S35	C.	53443	47256	51479	48232	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	51479	48232	50548	48010	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	50548	48010	48729	48211	AG	1300	1.0	0.3	26.9	18.9	0	10
	F.	48729	48211	46777	47665	AG	1300	1.0	0.3	26.9	18.9	0	10
	G.	46777	47665	46320	47769	AG	1300	1.0	0.3	26.9	18.9	0	10
	H.	46320	47769	44834	47741	AG	1300	1.0	0.3	26.9	18.9	0	10
	A.	44834	47741	44173	47524	AG	1300	1.0	0.3	26.9	18.9	0	10
	B.	44173	47524	43275	47622	AG	1300	1.0	0.3	26.9	18.9	0	10
	C.	43275	47622	42014	48024	AG	1300	1.0	0.3	26.9	18.9	0	10
	D.	42014	48024	40884	48637	AG	1300	1.0	0.3	26.9	18.9	0	10
	E.	40884	48637	40388	48788	AG	1300	1.0	0.3	26.9	18.9	0	10

* Figures are magnified 10 times from actual Figures.

** Figures are magnified 100 times from actual Figures.

RECEPTOR WISE RESULTS

The receptors have been assumed at a distance of 20 m from the centre of the road and receptor wise results are listed below:

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NO _x	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
S01	1	12287	78180	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	2	12850	78369	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	3	13070	77152	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	4	12595	76061	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	5	12835	75295	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	6	12591	73904	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	7	12111	73542	1.5	0.363	0.102	0.90	1.19	0.37	7.80
	8	12201	72686	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	9	11974	72002	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	10	12299	78142	1.5	0.318	0.089	0.80	1.05	0.32	6.74
	11	12819	78317	1.5	0.280	0.078	0.70	0.92	0.29	6.11
	12	13029	77157	1.5	0.274	0.077	0.70	0.92	0.28	5.90
	13	12552	76063	1.5	0.332	0.093	0.80	1.05	0.34	7.17
	14	12794	75292	1.5	0.260	0.073	0.60	0.79	0.26	5.48
	15	12555	73926	1.5	0.305	0.085	0.70	0.92	0.31	6.53
	16	12069	73561	1.5	0.035	0.010	0.10	0.13	0.04	0.84
	17	12160	72690	1.5	0.266	0.074	0.60	0.79	0.27	5.69
	18	11939	72022	1.5	0.326	0.091	0.80	1.05	0.33	6.96
S02	19	11974	72002	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	20	10573	70315	1.5	0.064	0.018	0.20	0.26	0.06	1.26
	21	9045	69160	1.5	0.378	0.106	0.90	1.19	0.38	8.01
	22	8650	68708	1.5	0.117	0.033	0.30	0.40	0.12	2.53
	23	7917	69416	1.5	0.302	0.084	0.70	0.92	0.31	6.53
	24	8096	70287	1.5	0.233	0.065	0.60	0.79	0.24	5.06
	25	6298	72139	1.5	0.248	0.069	0.60	0.79	0.25	5.27
	26	5905	72286	1.5	0.263	0.074	0.60	0.79	0.27	5.69
	27	5831	72825	1.5	0.012	0.003	0.00	0.00	0.01	0.21
	28	11939	72022	1.5	0.000	0.000	0.00	0.00	0.00	0.00

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	29	10545	70344	1.5	0.365	0.102	0.90	1.19	0.37	7.80
	30	9017	69190	1.5	0.034	0.010	0.10	0.13	0.03	0.63
	31	8647	68766	1.5	0.349	0.098	0.80	1.05	0.36	7.59
	32	7960	69429	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	33	8139	70300	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	34	6320	72173	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	35	5942	72315	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	36	5868	72844	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S03	37	5831	72825	1.5	0.237	0.066	0.60	0.79	0.24	5.06
	38	5568	73084	1.5	0.272	0.076	0.60	0.79	0.28	5.90
	39	5539	73386	1.5	0.287	0.080	0.70	0.92	0.29	6.11
	40	5297	73329	1.5	0.296	0.083	0.70	0.92	0.30	6.32
	41	5184	73678	1.5	0.034	0.010	0.10	0.13	0.03	0.63
	42	5372	73766	1.5	0.250	0.070	0.60	0.79	0.26	5.48
	43	4782	74938	1.5	0.301	0.084	0.70	0.92	0.31	6.53
	44	4852	75312	1.5	0.302	0.084	0.70	0.92	0.31	6.53
	45	4659	75318	1.5	0.105	0.029	0.20	0.26	0.11	2.32
	46	5868	72844	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	47	5607	73103	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	48	5574	73436	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	49	5324	73377	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	50	5233	73657	1.5	0.370	0.104	0.90	1.19	0.38	8.01
	51	5427	73747	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	52	4824	74944	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	53	4900	75351	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	54	4701	75357	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S04	55	4659	75318	1.5	0.176	0.049	0.40	0.53	0.18	3.79
	56	4665	75422	1.5	0.307	0.086	0.70	0.92	0.31	6.53
	57	4314	75390	1.5	0.281	0.079	0.70	0.92	0.29	6.11
	58	4319	76110	1.5	0.304	0.085	0.70	0.92	0.31	6.53
	59	3983	76114	1.5	0.289	0.081	0.70	0.92	0.29	6.11
	60	4701	75357	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	61	4707	75467	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	62	4354	75434	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	63	4359	76149	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	64	4004	76154	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ1	4589	76060	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S05	65	3983	76114	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	66	3261	76119	1.5	0.419	0.117	1.00	1.32	0.43	9.06
	67	3165	76078	1.5	0.449	0.126	1.10	1.45	0.46	9.70
	68	3964	76154	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	69	3253	76159	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	70	3149	76115	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S06	71	24522	81305	1.5	0.380	0.106	0.90	1.19	0.39	8.22
	72	24298	81949	1.5	0.441	0.123	1.00	1.32	0.45	9.48
	73	24883	84209	1.5	0.438	0.122	1.00	1.32	0.45	9.48
	74	24908	84934	1.5	0.449	0.126	1.10	1.45	0.46	9.70
	75	25187	85882	1.5	0.420	0.117	1.00	1.32	0.43	9.06

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	76	25216	87324	1.5	0.465	0.130	1.10	1.45	0.47	9.91
	77	25401	88026	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	78	24559	81318	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	79	24340	81950	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	80	24922	84203	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	81	24948	84927	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	82	25227	85876	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	83	25255	87318	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	84	25431	87985	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ5	24355	82625	1.5	0.091	0.025	0.20	0.26	0.09	1.90
S07	85	25401	88026	1.5	0.352	0.098	0.80	1.05	0.36	7.59
	86	25314	88137	1.5	0.614	0.172	1.50	1.98	0.62	13.07
	87	25414	88318	1.5	0.040	0.011	0.10	0.13	0.04	0.84
	88	25645	88399	1.5	0.403	0.113	1.00	1.32	0.41	8.64
	89	25639	88474	1.5	0.342	0.096	0.80	1.05	0.35	7.38
	90	25459	88769	1.5	0.003	0.001	0.00	0.00	0.00	0.00
	91	25438	88043	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	92	25362	88141	1.5	0.123	0.034	0.30	0.40	0.13	2.74
	93	25441	88285	1.5	0.509	0.142	1.20	1.58	0.52	10.96
	94	25687	88372	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S08	95	25678	88487	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	96	25502	88776	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	97	25459	88769	1.5	0.358	0.100	0.90	1.19	0.36	7.59
	98	24976	89917	1.5	0.364	0.102	0.90	1.19	0.37	7.80
	99	24434	89717	1.5	0.459	0.128	1.10	1.45	0.47	9.91
	100	24234	89119	1.5	0.019	0.005	0.00	0.00	0.02	0.42
	101	24390	88282	1.5	0.013	0.004	0.00	0.00	0.01	0.21
	102	21425	87483	1.5	0.439	0.123	1.00	1.32	0.45	9.48
	103	21254	87824	1.5	0.354	0.099	0.80	1.05	0.36	7.59
	104	20711	88201	1.5	0.348	0.097	0.80	1.05	0.35	7.38
	105	20672	87792	1.5	0.033	0.009	0.10	0.13	0.03	0.63
	106	25484	88815	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	107	24998	89968	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	108	24403	89748	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	109	24193	89122	1.5	0.474	0.133	1.10	1.45	0.48	10.12
	110	24344	88311	1.5	0.396	0.111	0.90	1.19	0.40	8.43
	111	21446	87530	1.5	0.003	0.001	0.00	0.00	0.00	0.00
	112	21285	87852	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	113	20677	88273	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	114	20629	87764	1.5	0.406	0.114	1.00	1.32	0.41	8.64
	AQ4	24640	89946	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S09	115	20672	87792	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	116	20923	87713	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	117	20931	87494	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	118	19510	86477	1.5	0.539	0.151	1.30	1.71	0.55	11.59
	119	19244	85994	1.5	0.044	0.012	0.10	0.13	0.04	0.84
	120	18585	85541	1.5	0.563	0.158	1.30	1.71	0.57	12.01
	121	17927	84724	1.5	0.097	0.027	0.20	0.26	0.10	2.11

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NO _x	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	122	15447	82933	1.5	0.552	0.154	1.30	1.71	0.56	11.80
	123	14796	81878	1.5	0.036	0.010	0.10	0.13	0.04	0.84
	124	20629	87764	1.5	0.029	0.008	0.10	0.13	0.03	0.63
	125	20884	87684	1.5	0.393	0.110	0.90	1.19	0.40	8.43
	126	20890	87514	1.5	0.401	0.112	1.00	1.32	0.41	8.64
	127	19480	86504	1.5	0.026	0.007	0.10	0.13	0.03	0.63
	128	19213	86022	1.5	0.532	0.149	1.30	1.71	0.54	11.38
	129	18558	85571	1.5	0.049	0.014	0.10	0.13	0.05	1.05
	130	17899	84753	1.5	0.549	0.154	1.30	1.71	0.56	11.80
	131	15418	82961	1.5	0.039	0.011	0.10	0.13	0.04	0.84
	132	14764	81903	1.5	0.543	0.152	1.30	1.71	0.55	11.59
S10	133	14796	81878	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	134	12965	80024	1.5	0.312	0.087	0.70	0.92	0.32	6.74
	135	9895	81942	1.5	0.349	0.098	0.80	1.05	0.36	7.59
	136	9683	82297	1.5	0.351	0.098	0.80	1.05	0.36	7.59
	137	9045	82568	1.5	0.364	0.102	0.90	1.19	0.37	7.80
	138	8573	82527	1.5	0.430	0.120	1.00	1.32	0.44	9.27
	139	7164	82854	1.5	0.369	0.103	0.90	1.19	0.38	8.01
	140	6702	82737	1.5	0.435	0.122	1.00	1.32	0.44	9.27
	141	5504	82949	1.5	0.388	0.108	0.90	1.19	0.39	8.22
	142	14764	81903	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	143	12959	80075	1.5	0.337	0.094	0.80	1.05	0.34	7.17
	144	9924	81971	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	145	9711	82329	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	146	9052	82609	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	147	8576	82568	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	148	7163	82896	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	149	6700	82778	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	150	5517	82988	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ3	13668	80644	1.5	0.043	0.012	0.10	0.13	0.04	0.84
S11	151	5504	82949	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	152	4342	83519	1.5	0.348	0.097	0.80	1.05	0.35	7.38
	153	3847	83379	1.5	0.437	0.122	1.00	1.32	0.45	9.48
	154	4832	80451	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	155	4955	80080	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	156	4852	78910	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	157	4505	78342	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	158	4346	77924	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	159	4361	77607	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	160	5517	82988	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	161	4346	83562	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	162	3795	83406	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	163	4794	80438	1.5	0.371	0.104	0.90	1.19	0.38	8.01
	164	4914	80075	1.5	0.375	0.105	0.90	1.19	0.38	8.01
	165	4813	78922	1.5	0.437	0.122	1.00	1.32	0.44	9.27
	166	4469	78359	1.5	0.498	0.139	1.20	1.58	0.51	10.75
	167	4306	77931	1.5	0.471	0.132	1.10	1.45	0.48	10.12
	168	4321	77617	1.5	0.412	0.115	1.00	1.32	0.42	8.85

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	AQ2	3978	83321	1.5	0.106	0.030	0.30	0.40	0.11	2.32
S12	169	4361	77607	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	170	4204	77323	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	171	4318	76945	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	172	4022	76906	1.5	0.485	0.136	1.20	1.58	0.49	10.33
	173	4004	76154	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	174	4321	77617	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	175	4161	77327	1.5	0.508	0.142	1.20	1.58	0.52	10.96
	176	4266	76979	1.5	0.371	0.104	0.90	1.19	0.38	8.01
	177	3983	76941	1.5	0.041	0.011	0.10	0.13	0.04	0.84
	178	3964	76154	1.5	0.430	0.120	1.00	1.32	0.44	9.27
S13	179	72303	80475	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	180	71773	80623	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	181	70683	78411	1.5	0.476	0.133	1.10	1.45	0.48	10.12
	182	70674	77804	1.5	0.418	0.117	1.00	1.32	0.43	9.06
	183	70202	77456	1.5	0.043	0.012	0.10	0.13	0.04	0.84
	184	69796	76608	1.5	0.475	0.133	1.10	1.45	0.48	10.12
	185	72292	80436	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	186	71794	80576	1.5	0.381	0.106	0.90	1.19	0.39	8.22
	187	70723	78401	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	188	70714	77783	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	189	70234	77430	1.5	0.536	0.150	1.30	1.71	0.55	11.59
	190	69830	76587	1.5	0.004	0.001	0.00	0.00	0.00	0.00
	AQ8	72052	80629	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S14	191	74775	74221	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	192	74413	74373	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	193	74140	75146	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	194	72848	75726	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	195	71225	75850	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	196	69830	76587	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	197	74759	74184	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	198	74381	74343	1.5	0.365	0.102	0.90	1.19	0.37	7.80
	199	74108	75116	1.5	0.364	0.102	0.90	1.19	0.37	7.80
	200	72838	75686	1.5	0.357	0.100	0.80	1.05	0.36	7.59
	201	71213	75810	1.5	0.394	0.110	0.90	1.19	0.40	8.43
	202	69793	76561	1.5	0.327	0.091	0.80	1.05	0.33	6.96
	AQ9	74552	74506	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S15	203	69793	76561	1.5	0.012	0.003	0.00	0.00	0.01	0.21
	204	69077	77064	1.5	0.346	0.097	0.80	1.05	0.35	7.38
	205	68389	77187	1.5	0.385	0.108	0.90	1.19	0.39	8.22
	206	68579	76417	1.5	0.017	0.005	0.00	0.00	0.02	0.42
	207	68581	75751	1.5	0.011	0.003	0.00	0.00	0.01	0.21
	208	66285	76961	1.5	0.376	0.105	0.90	1.19	0.38	8.01
	209	63975	77807	1.5	0.365	0.102	0.90	1.19	0.37	7.80
	210	62504	77746	1.5	0.425	0.119	1.00	1.32	0.43	9.06
	211	61687	78060	1.5	0.377	0.106	0.90	1.19	0.38	8.01
	212	69796	76608	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	213	69092	77102	1.5	0.000	0.000	0.00	0.00	0.00	0.00

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	214	68335	77237	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	215	68539	76412	1.5	0.394	0.110	0.90	1.19	0.40	8.43
	216	68541	75818	1.5	0.433	0.121	1.00	1.32	0.44	9.27
	217	66301	76998	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	218	63982	77848	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	219	62511	77786	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	220	61702	78097	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ7	61988	77771	1.5	0.061	0.017	0.10	0.13	0.06	1.26
S16	221	61687	78060	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	222	60638	78553	1.5	0.341	0.095	0.80	1.05	0.35	7.38
	223	60189	78966	1.5	0.346	0.097	0.80	1.05	0.35	7.38
	224	59768	79033	1.5	0.365	0.102	0.90	1.19	0.37	7.80
	225	58964	79917	1.5	0.349	0.098	0.80	1.05	0.36	7.59
	226	57633	80287	1.5	0.400	0.112	1.00	1.32	0.41	8.64
	227	57638	80573	1.5	0.346	0.097	0.80	1.05	0.35	7.38
	228	57386	80840	1.5	0.346	0.097	0.80	1.05	0.35	7.38
	229	56876	80916	1.5	0.378	0.106	0.90	1.19	0.39	8.22
	230	61702	78097	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	231	60660	78587	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	232	60207	79004	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	233	59789	79071	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	234	58986	79953	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	235	57673	80317	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	236	57679	80588	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	237	57405	80878	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	238	56894	80954	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S17	239	56876	80916	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	240	55491	82137	1.5	0.340	0.095	0.80	1.05	0.35	7.38
	241	54122	82860	1.5	0.347	0.097	0.80	1.05	0.35	7.38
	242	53266	84033	1.5	0.378	0.106	0.90	1.19	0.38	8.01
	243	53142	84556	1.5	0.394	0.110	0.90	1.19	0.40	8.43
	244	52010	84728	1.5	0.382	0.107	0.90	1.19	0.39	8.22
	245	50462	83983	1.5	0.464	0.130	1.10	1.45	0.47	9.91
	246	50036	83688	1.5	0.520	0.145	1.20	1.58	0.53	11.17
	247	56894	80954	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	248	55514	82170	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	249	54149	82891	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	250	53303	84051	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	251	53175	84591	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	252	52004	84769	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	253	50442	84018	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	254	50018	83724	1.5	0.005	0.002	0.00	0.00	0.01	0.21
S18	255	50036	83688	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	256	48813	83306	1.5	0.450	0.126	1.10	1.45	0.46	9.70
	257	48149	82747	1.5	0.490	0.137	1.20	1.58	0.50	10.54
	258	47303	82405	1.5	0.480	0.134	1.10	1.45	0.49	10.33
	259	46890	82035	1.5	0.422	0.118	1.00	1.32	0.43	9.06
	260	46568	81920	1.5	0.477	0.133	1.10	1.45	0.49	10.33

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	261	46552	81717	1.5	0.121	0.034	0.30	0.40	0.12	2.53
	262	45986	81467	1.5	0.477	0.133	1.10	1.45	0.49	10.33
	263	45982	81828	1.5	0.003	0.001	0.00	0.00	0.00	0.00
	264	50018	83724	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	265	48794	83342	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	266	48128	82782	1.5	0.085	0.024	0.20	0.26	0.09	1.90
	267	47282	82439	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	268	46869	82070	1.5	0.124	0.035	0.30	0.40	0.13	2.74
	269	46530	81949	1.5	0.003	0.001	0.00	0.00	0.00	0.00
	270	46514	81744	1.5	0.557	0.156	1.30	1.71	0.57	12.01
	271	46026	81528	1.5	0.016	0.004	0.00	0.00	0.02	0.42
	272	46022	81844	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S19	273	45982	81828	1.5	0.347	0.097	0.80	1.05	0.35	7.38
	274	44404	83443	1.5	0.368	0.103	0.90	1.19	0.37	7.80
	275	43244	83760	1.5	0.376	0.105	0.90	1.19	0.38	8.01
	276	42115	83711	1.5	0.424	0.119	1.00	1.32	0.43	9.06
	277	41073	84026	1.5	0.371	0.104	0.90	1.19	0.38	8.01
	278	40896	84249	1.5	0.353	0.099	0.80	1.05	0.36	7.59
	279	39323	84865	1.5	0.366	0.102	0.90	1.19	0.37	7.80
	280	39089	84791	1.5	0.453	0.127	1.10	1.45	0.46	9.70
	281	38685	84935	1.5	0.370	0.104	0.90	1.19	0.38	8.01
	282	46022	81844	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	283	44425	83478	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	284	43249	83800	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	285	42120	83751	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	286	41096	84061	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	287	40921	84283	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	288	39324	84907	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	289	39089	84833	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	290	38691	84975	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S20	291	38685	84935	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	292	37939	84913	1.5	0.422	0.118	1.00	1.32	0.43	9.06
	293	37315	84998	1.5	0.394	0.110	0.90	1.19	0.40	8.43
	294	36767	84850	1.5	0.437	0.122	1.00	1.32	0.44	9.27
	295	34870	85238	1.5	0.396	0.111	0.90	1.19	0.40	8.43
	296	34632	85388	1.5	0.349	0.097	0.80	1.05	0.35	7.38
	297	33620	85475	1.5	0.389	0.109	0.90	1.19	0.40	8.43
	298	33260	85334	1.5	0.480	0.134	1.10	1.45	0.49	10.33
	299	33158	85094	1.5	0.058	0.016	0.10	0.13	0.06	1.26
	300	38691	84975	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	301	37941	84953	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	302	37313	85039	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	303	36766	84891	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	304	34885	85275	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	305	34645	85427	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	306	33615	85516	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	307	33230	85365	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	308	33134	85139	1.5	0.563	0.157	1.30	1.71	0.57	12.01

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
S21	309	33158	85094	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	310	32638	85194	1.5	0.382	0.107	0.90	1.19	0.39	8.22
	311	32176	85458	1.5	0.464	0.130	1.10	1.45	0.47	9.91
	312	32211	85871	1.5	0.357	0.100	0.80	1.05	0.36	7.59
	313	31609	86812	1.5	0.370	0.104	0.90	1.19	0.38	8.01
	314	30907	87028	1.5	0.361	0.101	0.90	1.19	0.37	7.80
	315	30411	87671	1.5	0.361	0.101	0.90	1.19	0.37	7.80
	316	29561	87904	1.5	0.380	0.106	0.90	1.19	0.39	8.22
	317	29136	88177	1.5	0.355	0.099	0.80	1.05	0.36	7.59
	318	33134	85139	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	319	32652	85232	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	320	32218	85480	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	321	32252	85882	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	322	31635	86845	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	323	30931	87062	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	324	30435	87706	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	325	29578	87941	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	326	29140	88222	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ6	32625	85083	1.5	0.083	0.023	0.20	0.26	0.08	1.69
S22	327	29136	88177	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	328	28984	88115	1.5	0.465	0.130	1.10	1.45	0.47	9.91
	329	28508	88493	1.5	0.344	0.096	0.80	1.05	0.35	7.38
	330	27951	88659	1.5	0.375	0.105	0.90	1.19	0.38	8.01
	331	27007	88609	1.5	0.411	0.115	1.00	1.32	0.42	8.85
	332	26592	89030	1.5	0.340	0.095	0.80	1.05	0.35	7.38
	333	25957	88781	1.5	0.458	0.128	1.10	1.45	0.47	9.91
	334	25640	88923	1.5	0.362	0.101	0.90	1.19	0.37	7.80
	335	25502	88776	1.5	0.120	0.033	0.30	0.40	0.12	2.53
	336	29140	88222	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	337	28991	88161	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	338	28527	88529	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	339	27955	88699	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	340	27023	88650	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	341	26602	89077	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	342	25958	88824	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	343	25630	88971	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	344	25484	88815	1.5	0.173	0.048	0.40	0.53	0.18	3.79
S23	345	59007	6652	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	346	58669	6587	1.5	0.436	0.122	1.00	1.32	0.44	9.27
	347	58295	7041	1.5	0.332	0.093	0.80	1.05	0.34	7.17
	348	57778	6850	1.5	0.467	0.131	1.10	1.45	0.48	10.12
	349	57412	6899	1.5	0.401	0.112	1.00	1.32	0.41	8.64
	350	56549	6391	1.5	0.479	0.134	1.10	1.45	0.49	10.33
	351	56408	6448	1.5	0.356	0.100	0.80	1.05	0.36	7.59
	352	56357	6294	1.5	0.066	0.018	0.20	0.26	0.07	1.48
	353	54892	5698	1.5	0.460	0.129	1.10	1.45	0.47	9.91
	354	59000	6692	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	355	58685	6631	1.5	0.000	0.000	0.00	0.00	0.00	0.00

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	356	58308	7089	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	357	57773	6891	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	358	57404	6940	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	359	56545	6436	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	360	56384	6501	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	361	56325	6324	1.5	0.523	0.146	1.20	1.58	0.53	11.17
	362	54862	5729	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S24	363	54892	5698	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	364	54236	4201	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	365	53664	4018	1.5	0.477	0.133	1.10	1.45	0.49	10.33
	366	52503	4121	1.5	0.389	0.109	0.90	1.19	0.40	8.43
	367	51621	4729	1.5	0.341	0.095	0.80	1.05	0.35	7.38
	368	51228	4608	1.5	0.443	0.124	1.10	1.45	0.45	9.48
	369	50413	5331	1.5	0.353	0.099	0.80	1.05	0.36	7.59
	370	50209	5757	1.5	0.360	0.101	0.90	1.19	0.37	7.80
	371	49200	6243	1.5	0.370	0.104	0.90	1.19	0.38	8.01
	372	54862	5729	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	373	54207	4234	1.5	0.489	0.137	1.20	1.58	0.50	10.54
	374	53659	4059	1.5	0.032	0.009	0.10	0.13	0.03	0.63
	375	52517	4160	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	376	51628	4773	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	377	51238	4653	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	378	50445	5355	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	379	50239	5787	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	380	49215	6280	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ24	54308	4150	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S25	381	49200	6243	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	382	48478	6449	1.5	0.365	0.102	0.90	1.19	0.37	7.80
	383	48008	7083	1.5	0.358	0.100	0.90	1.19	0.36	7.59
	384	47122	7160	1.5	0.389	0.109	0.90	1.19	0.40	8.43
	385	46927	7310	1.5	0.484	0.135	1.20	1.58	0.49	10.33
	386	47078	7551	1.5	0.366	0.102	0.90	1.19	0.37	7.80
	387	46885	8099	1.5	0.342	0.096	0.80	1.05	0.35	7.38
	388	46613	8448	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	389	46858	8575	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	390	49215	6280	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	391	48502	6484	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	392	48029	7121	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	393	47137	7199	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	394	46981	7320	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	395	47122	7546	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	396	46921	8119	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	397	46674	8435	1.5	0.493	0.138	1.20	1.58	0.50	10.54
	398	46896	8549	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ25	58509	6999	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S26	399	46858	8575	1.5	0.428	0.120	1.00	1.32	0.44	9.27
	400	46887	8890	1.5	0.532	0.149	1.30	1.71	0.54	11.38
	401	47855	10348	1.5	0.423	0.118	1.00	1.32	0.43	9.06

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	402	47859	10757	1.5	0.354	0.099	0.80	1.05	0.36	7.59
	403	48572	11489	1.5	0.477	0.133	1.10	1.45	0.49	10.33
	404	49194	12674	1.5	0.419	0.117	1.00	1.32	0.43	9.06
	405	49209	13120	1.5	0.493	0.138	1.20	1.58	0.50	10.54
	406	49414	13556	1.5	0.044	0.012	0.10	0.13	0.05	1.05
	407	49714	13806	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	408	46896	8549	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	409	46926	8876	1.5	0.009	0.003	0.00	0.00	0.01	0.21
	410	47895	10336	1.5	0.002	0.001	0.00	0.00	0.00	0.00
	411	47899	10740	1.5	0.266	0.074	0.60	0.79	0.27	5.69
	412	48605	11465	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	413	49234	12663	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	414	49248	13111	1.5	0.002	0.001	0.00	0.00	0.00	0.00
	415	49446	13531	1.5	0.412	0.115	1.00	1.32	0.42	8.85
	416	49760	13792	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ23	46768	8855	1.5	0.140	0.039	0.30	0.40	0.14	2.95
S27	417	49714	13806	1.5	0.369	0.103	0.90	1.19	0.38	8.01
	418	49478	14635	1.5	0.484	0.135	1.20	1.58	0.49	10.33
	419	49798	15280	1.5	0.437	0.122	1.00	1.32	0.44	9.27
	420	50120	17591	1.5	0.344	0.096	0.80	1.05	0.35	7.38
	421	49888	17941	1.5	0.390	0.109	0.90	1.19	0.40	8.43
	422	49775	18703	1.5	0.437	0.122	1.00	1.32	0.44	9.27
	423	50241	20405	1.5	0.043	0.012	0.10	0.13	0.04	0.84
	424	50582	20620	1.5	0.438	0.123	1.00	1.32	0.45	9.48
	425	50668	21140	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	426	49760	13792	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	427	49521	14631	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	428	49837	15268	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	429	50162	17601	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	430	49926	17956	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	431	49816	18701	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	432	50275	20380	1.5	0.561	0.157	1.30	1.71	0.57	12.01
	433	50618	20596	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	434	50710	21150	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ22	49979	15547	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S28	435	50668	21140	1.5	0.348	0.097	0.80	1.05	0.35	7.38
	436	50409	21481	1.5	0.494	0.138	1.20	1.58	0.50	10.54
	437	51030	22469	1.5	0.441	0.123	1.00	1.32	0.45	9.48
	438	51518	24665	1.5	0.471	0.132	1.10	1.45	0.48	10.12
	439	51763	25284	1.5	0.348	0.097	0.80	1.05	0.35	7.38
	440	51479	25568	1.5	0.468	0.131	1.10	1.45	0.48	10.12
	441	51661	25967	1.5	0.361	0.101	0.90	1.19	0.37	7.80
	442	51291	27052	1.5	0.352	0.099	0.80	1.05	0.36	7.59
	443	50433	28488	1.5	0.023	0.006	0.10	0.13	0.02	0.42
	444	50710	21150	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	445	50458	21483	1.5	0.002	0.001	0.00	0.00	0.00	0.00
	446	51067	22454	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	447	51556	24653	1.5	0.000	0.000	0.00	0.00	0.00	0.00

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NOx	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	448	51809	25293	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	449	51527	25577	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	450	51704	25965	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	451	51328	27069	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	452	50467	28509	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ21	51702	25562	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S29	453	50433	28488	1.5	0.321	0.090	0.80	1.05	0.33	6.96
	454	46499	34206	1.5	0.359	0.101	0.90	1.19	0.37	7.80
	455	45862	34231	1.5	0.383	0.107	0.90	1.19	0.39	8.22
	456	44378	38260	1.5	0.459	0.128	1.10	1.45	0.47	9.91
	457	44546	38683	1.5	0.334	0.093	0.80	1.05	0.34	7.17
	458	44257	38987	1.5	0.352	0.099	0.80	1.05	0.36	7.59
	459	42040	45578	1.5	0.369	0.103	0.90	1.19	0.38	8.01
	460	40370	48779	1.5	0.004	0.001	0.00	0.00	0.00	0.00
	461	50467	28509	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	462	46521	34245	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	463	45890	34270	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	464	44421	38260	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	465	44593	38692	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	466	44292	39009	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	467	42077	45593	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	468	40427	48755	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ18	44728	37857	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ19	46294	34362	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ20	49379	30412	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S30	469	40370	48779	1.5	0.348	0.097	0.80	1.05	0.35	7.38
	470	37137	54320	1.5	0.414	0.116	1.00	1.32	0.42	8.85
	471	37162	54694	1.5	0.375	0.105	0.90	1.19	0.38	8.01
	472	36378	56889	1.5	0.465	0.130	1.10	1.45	0.47	9.91
	473	36437	57143	1.5	0.339	0.095	0.80	1.05	0.34	7.17
	474	36195	57537	1.5	0.409	0.114	1.00	1.32	0.42	8.85
	475	36221	58118	1.5	0.356	0.100	0.80	1.05	0.36	7.59
	476	35763	58982	1.5	0.344	0.096	0.80	1.05	0.35	7.38
	477	34398	60774	1.5	0.279	0.078	0.70	0.92	0.28	5.90
	478	40401	48805	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	479	37178	54330	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	480	37203	54699	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	481	36419	56892	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	482	36480	57150	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	483	36236	57547	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	484	36261	58128	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	485	35797	59004	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	486	34424	60807	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ16	36258	56895	1.5	0.084	0.024	0.20	0.26	0.09	1.90
	AQ17	40329	49197	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S31	487	34398	60774	1.5	0.063	0.018	0.20	0.26	0.06	1.26
	488	34072	60922	1.5	0.366	0.102	0.90	1.19	0.37	7.80
	489	33850	61736	1.5	0.445	0.125	1.10	1.45	0.45	9.48

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NO _x	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	490	34185	63548	1.5	0.027	0.008	0.10	0.13	0.03	0.63
	491	34645	63748	1.5	0.378	0.106	0.90	1.19	0.38	8.01
	492	34521	64352	1.5	0.347	0.097	0.80	1.05	0.35	7.38
	493	34280	64743	1.5	0.457	0.128	1.10	1.45	0.47	9.91
	494	34362	65079	1.5	0.380	0.106	0.90	1.19	0.39	8.22
	495	34030	66101	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	496	34424	60807	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	497	34106	60951	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	498	33891	61738	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	499	34221	63520	1.5	0.500	0.140	1.20	1.58	0.51	10.75
	500	34691	63725	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	501	34559	64367	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	502	34323	64750	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	503	34403	65081	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	504	34069	66112	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ15	33895	62965	1.5	0.093	0.026	0.20	0.26	0.09	1.90
S32	505	34030	66101	1.5	0.384	0.107	0.90	1.19	0.39	8.22
	506	33397	68813	1.5	0.351	0.098	0.80	1.05	0.36	7.59
	507	32513	69659	1.5	0.348	0.097	0.80	1.05	0.35	7.38
	508	32059	69970	1.5	0.398	0.111	0.90	1.19	0.41	8.64
	509	32018	70738	1.5	0.371	0.104	0.90	1.19	0.38	8.01
	510	31230	73221	1.5	0.446	0.125	1.10	1.45	0.45	9.48
	511	31366	73689	1.5	0.374	0.105	0.90	1.19	0.38	8.01
	512	31181	74606	1.5	0.344	0.096	0.80	1.05	0.35	7.38
	513	30717	75054	1.5	0.001	0.000	0.00	0.00	0.00	0.00
	514	34069	66112	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	515	33433	68834	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	516	32538	69691	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	517	32098	69991	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	518	32058	70745	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	519	31272	73222	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	520	31407	73687	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	521	31218	74626	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	522	30754	75073	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ13	31900	70390	1.5	0.075	0.021	0.20	0.26	0.08	1.69
	AQ14	34038	66790	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S33	523	30717	75054	1.5	0.376	0.105	0.90	1.19	0.38	8.01
	524	30466	76644	1.5	0.358	0.100	0.90	1.19	0.36	7.59
	525	30022	76958	1.5	0.456	0.128	1.10	1.45	0.46	9.70
	526	30233	77847	1.5	0.374	0.105	0.90	1.19	0.38	8.01
	527	30104	78490	1.5	0.354	0.099	0.80	1.05	0.36	7.59
	528	29022	80268	1.5	0.375	0.105	0.90	1.19	0.38	8.01
	529	28245	84090	1.5	0.359	0.100	0.90	1.19	0.37	7.80
	530	25431	87985	1.5	0.351	0.098	0.80	1.05	0.36	7.59
	531	30754	75073	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	532	30503	76667	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	533	30067	76975	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	534	30274	77846	1.5	0.000	0.000	0.00	0.00	0.00	0.00

ANNEXURE : 6 Contd..

Sec. No.	Receptor No	CO-Ordinates (m)			PM ₁₀ µg/m ³	PM _{2.5} µg/m ³	SO ₂		NO _x	
		X	Y	Z			PPM**	µg/m ³	PPM*	µg/m ³
	535	30142	78504	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	536	29060	80283	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	537	28282	84106	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	538	25438	88043	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ10	27893	84863	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ11	28877	80380	1.5	0.078	0.022	0.20	0.26	0.08	1.69
	AQ12	29995	78244	1.5	0.065	0.018	0.20	0.26	0.07	1.48
S34	539	53516	47127	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	540	53392	47169	1.5	0.459	0.128	1.10	1.45	0.47	9.91
	541	53418	47246	1.5	0.354	0.099	0.80	1.05	0.36	7.59
	542	51477	48211	1.5	0.361	0.101	0.90	1.19	0.37	7.80
	543	50549	47990	1.5	0.451	0.126	1.10	1.45	0.46	9.70
	544	48731	48190	1.5	0.384	0.107	0.90	1.19	0.39	8.22
	545	46778	47644	1.5	0.438	0.122	1.00	1.32	0.45	9.48
	546	46318	47749	1.5	0.378	0.106	0.90	1.19	0.38	8.01
	547	44837	47721	1.5	0.420	0.117	1.00	1.32	0.43	9.06
	548	53529	47164	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	549	53443	47194	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	550	53467	47266	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	551	51482	48254	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	552	50546	48030	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	553	48728	48231	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	554	46777	47685	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	555	46322	47789	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	556	44830	47761	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ27	53568	47311	1.5	0.000	0.000	0.00	0.00	0.00	0.00
S35	557	44837	47721	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	558	44175	47504	1.5	0.463	0.130	1.10	1.45	0.47	9.91
	559	43271	47602	1.5	0.389	0.109	0.90	1.19	0.40	8.43
	560	42006	48005	1.5	0.362	0.101	0.90	1.19	0.37	7.80
	561	40876	48619	1.5	0.362	0.101	0.90	1.19	0.37	7.80
	562	40427	48755	1.5	0.367	0.103	0.90	1.19	0.37	7.80
	563	44830	47761	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	564	44170	47544	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	565	43279	47642	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	566	42022	48042	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	567	40892	48656	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	568	40401	48805	1.5	0.000	0.000	0.00	0.00	0.00	0.00
	AQ26	44445	47485	1.5	0.101	0.028	0.20	0.26	0.10	2.11
MAX					0.614	0.172	1.5	1.98	0.62	13.07

Results are 100 times magnified

** Results are 1000 times magnified

SUMMARY OF MAXIMUM RESULTS

Section	Magnified	Actual (µg/m ³)	Receptor No.	Section
PM ₁₀	61.4, µg/m ³	0.614	86	S07
PM _{2.5}	17.2, µg/m ³	0.172	86	S07
SO ₂	1.5, PPM	1.98	86	S07
NO _x	0.62, PPM	13.07	86	S07

BACKGROUND NOTES**Emissions from trucks as per norms**

Emission standards for new heavy-duty engines—applicable as per Bharat Stage IV (applicable nation wide since April 2017).

EU Emission Standards for Heavy-Duty Diesel Engines: Steady-State Testing

Stage	Date	Test	CO g/kWh	HC	NOx	PM	PN 1/kWh	Smoke 1/m
Euro III	1999.10 EEV only	ESC & ELR	1.5	0.25	2	0.02		0.15
	2000.1		2.1	0.66	5	0.10a		0.8
Euro IV	2005.1		1.5	0.46	3.5	0.02		0.5
Euro V	2008.1		1.5	0.46	2	0.02		0.5
Euro VI	2013.01	WHSC	1.5	0.13	0.4	0.01	8.0×10 ¹¹	

a- PM = 0.13 g/kWh for engines < 0.75 dm³ swept volume per cylinder and a rated power speed > 3000 min⁻¹

Calculation for Emission from tipping trucks of 20 T capacity which will be plying

Truck capacity 20 Te. 16 or 24 Hours/day (operational)
vehicle speed 40 Km/hr 178 HP/truck

	Units	NOx	PM	SO ₂
		g/kWh (Stage : Euro IV)		
		3.5	0.02	
Capacity of Diesel Engine	KWH	135.28	135.28	135.28
Emission permitted				
Resultant KWH	KWH	135.28	135.28	135.28
Emission from one truck	g/truck/hour	473.48	2.7056	67.284
Emission from 1 truck/km	g/km	11.84	0.06764	1.6821
Emission from 1 truck/mile	g/mile	18.9392	0.10822	2.6914

As per AP-42, 5th Edition of US EPA, Section 13.2.1.3, the quantity of particulate emissions from re-suspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

$$E = [k (sL)^{0.91} \times (W)^{1.02}] \times (1-P/4N)$$

- where: E = particulate emission factor (having units matching the units of k),
 k = particle size multiplier for particle size range and units of interest, which will be 0.62 g/VKT for PM₁₀ and 0.15 g/VKT for PM_{2.5} as per Table 13.2.1-1 of AP-42, US EPA.
 sL = road surface silt loading (grams per square meter) (g/m²). The average silt content has been taken as 0.03 g/m² as on page 13.2.1-5 of AP-42, US EPA.
 W = average weight (tons) of the vehicles travelling the road, which is 20 (average of loaded and empty trucks of 20 Tonne capacity) for the traffic.
 P = Total wet days with at least 0.254 mm (0.01 in) of precipitation during the averaging period which is 42 days at IMD Khandwa (avg. from 1981-2010), and
 N = Number of days in the averaging period which is 365 days

Standards for Ambient air quality (CPCB Notification, Delhi, 18th November 2009)

Pollutants	24 hourly Concentration in Ambient Air (µg/m ³)	
	Industrial, Residential, Rural and other area	Ecologically Sensitive area (notified by Central Govt.)
Sulphur Dioxide (SO ₂)	80	80
Oxides of Nitrogen as NO ₂	80	80
Particulate Matter <10µm (PM ₁₀)	100	100
Respirable Particulate Matter <2.5µm (PM _{2.5})	60	60
Ozone (O ₃)	100 (8 hourly)	100 (8 hourly)
Lead (Pb)	1.0	1.0
Carbon Monoxide (CO)	2 (8 hourly)	2 (8 hourly)
Ammonia (NH ₃)	400	400
Benzene (C ₆ H ₆)	5 (Annual)	5 (Annual)
Benzo(a)Pyrene (BaP), particulate phase only	1 (ng/m ³ annual)	1 (ng/m ³ annual)

ANNEXURE : 6 Contd..

Pollutants	24 hourly Concentration in Ambient Air ($\mu\text{g}/\text{m}^3$)	
	Industrial, Residential, Rural and other area	Ecologically Sensitive area (notified by Central Govt.)
Arsenic (As)	6 (ng/m^3 annual)	6 (ng/m^3 annual)
Nickel (Ni)	20 (ng/m^3 annual)	20 (ng/m^3 annual)

