

**Construction of 4 Lane at Grade/ Elevated  
Ganga Path connecting Munger (Safiabad) –  
Bariyarpur – Ghorghat –Sultanganj – Bhagalpur  
– Sabour (Bihar) on Hybrid Annuity Mode**

**Feb - 2026**

**By  
Bihar State Road Development Corporation Limited  
(BSRDCL), Government of Bihar**

**MONITORING  
PLAN**

**Environmental Consultant**



**Building Environment (India) Pvt. Ltd**

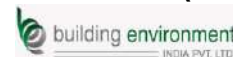
**801, 8th Floor, 64 One, Greenscape Shakti, Plot  
no. 12, Sector - 15, CBD Belapur, Navi Mumbai  
(India) 400614**

**Certificate No. NABET/EIA/25-28/RA 0409**

**Valid Till: May 28, 2028**

**By**

**Dr. Atul Vanerkar (FAE)  
Building Environment (India) Pvt. Ltd**



**801, 8th Floor, 64 One, Greenscape Shakti, Plot  
no. 12, Sector - 15, CBD Belapur, Navi Mumbai  
(India) 400614**

**MONITORING LABORATORY**

**Green Envirosafe Engineers & Consultant Pvt. Ltd, Pune, Maharashtra  
(Lab Approved by MoEF&CC, New Delhi)**

**STUDY PERIOD**

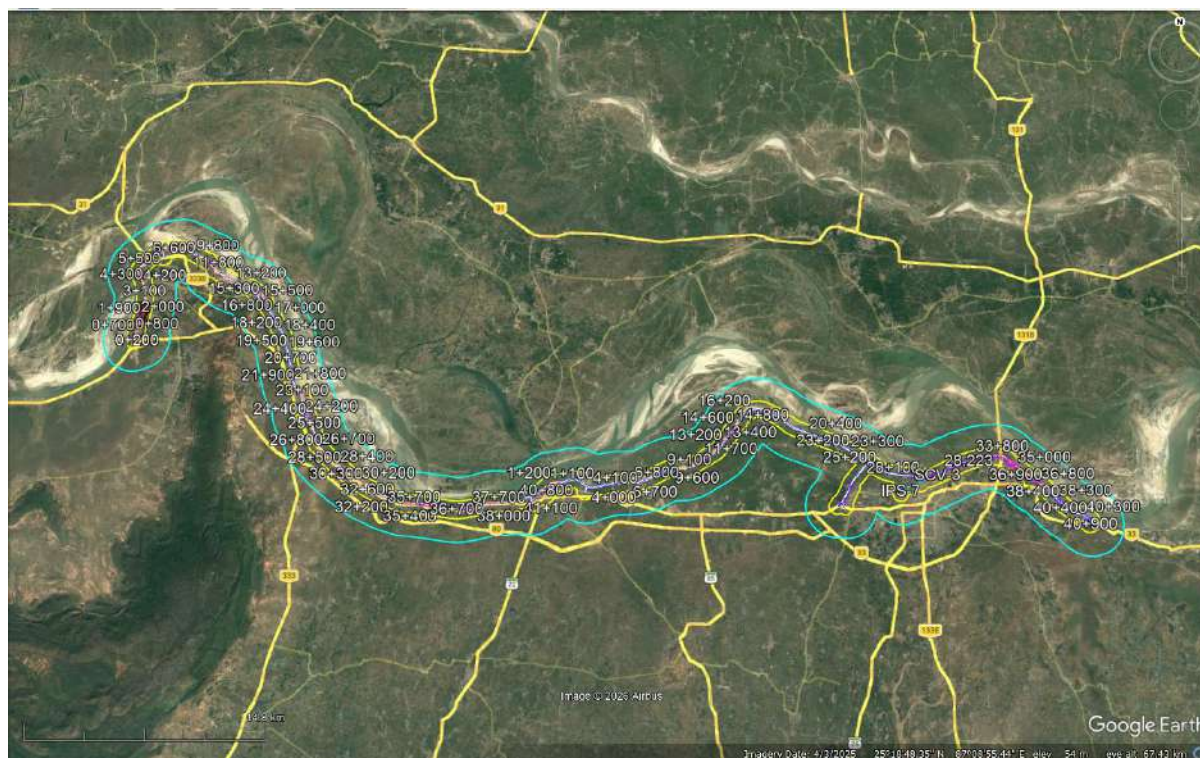
**(Summer Season) 2nd March 2026 to 26th May 2026**

## **Introduction:**

The proposed project involves the construction of a 4-Lane At-Grade/Elevated Ganga Path connecting Munger (Safiabad) – Bariyarpur – Ghorghat – Sultanganj – Bhagalpur – Sabour, being developed under the Hybrid Annuity Mode (HAM) by the Bihar State Road Development Corporation Limited (BSRDCL), Government of Bihar, in two contiguous packages.

The proposed corridor is a greenfield road project with a total length of approximately 83.33 km, comprising the Munger (Safiabad) – Bariyarpur – Ghorghat – Sultanganj stretch (42 km) and the Sultanganj – Bhagalpur – Sabour stretch (41.33 km). The alignment commences at Chainage 0+000 near Safiabad, Munger, at geographic coordinates 25°20'26.21" N, 86°27'51.07" E, and terminates near Sabour, Bhagalpur District, at geographic coordinates 25°13'39.91" N, 87°04'49.79" E, traversing the districts of Munger, Begusarai and Bhagalpur in the State of Bihar. The alignment generally follows the southern bank of the River Ganga, running through plain alluvial and riverine floodplain terrain.

The alignment passes adjacent to, and through portions of, the Eco-Sensitive Zone (ESZ) of the Vikramshila Gangetic Dolphin Sanctuary. As per the EIA Notification 2006 and its subsequent amendments, on account of its location within/adjacent to this ecologically sensitive area, the project falls under Category 'B' - Schedule 8(b), "Township and Area Development".



**Figure 1- 1: Google Image of Entire patch Road Project for Baseline Studies**

To establish the environmental conditions of the proposed site, baseline studies will be conducted. These studies will cover the land environment (soil), water environment, air environment, and meteorology within the impact zone. The assessment will be carried out at two levels: the project activity area and the surrounding areas not directly associated with the project.

The core zone is defined as the project boundary and an area of 0.5 km from the project center, within which soil, air, water, noise monitoring and ecology & biodiversity will be carried out. The buffer zone extends up to a 2 km along the chainage. The specific study area for each type of sampling has been illustrated in the respective sections using Google Earth images/pictures.

**Environmental components will be studied as part of the baseline environment:**

-  Soil Quality
-  Air Quality
-  Noise Quality and
-  Water Pollution

## 1. SOIL ENVIRONMENT

Soil sampling location was chosen based on a reconnaissance survey of the project area. Sample was collected by hand sampling augurs from surface region. The soil sample was taken at depth of 60 cm (sub surface) from the upper surface.

| <b>Number of stations:</b>       | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
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| <b>Frequency &amp; Duration:</b> | Once in season (Summer season)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| <b>Parameters:</b>               | <table><tr><th>Sr. No.</th><th>Parameters</th><th>Unit</th></tr><tr><td>1.</td><td>pH at 25°C</td><td>---</td></tr><tr><td>2.</td><td>Colour</td><td>---</td></tr><tr><td>3.</td><td>Texture</td><td>---</td></tr><tr><td>4.</td><td>Sand</td><td>%</td></tr><tr><td>5.</td><td>Slit</td><td>%</td></tr><tr><td>6.</td><td>Clay</td><td>%</td></tr><tr><td>7.</td><td>Electric Conductance at 25°C</td><td>mS/cm</td></tr><tr><td>8.</td><td>Total Organic Matter</td><td>%</td></tr><tr><td>9.</td><td>Organic Carbon</td><td>%</td></tr><tr><td>10.</td><td>Bulk Density</td><td>g/cm<sup>3</sup></td></tr><tr><td>11.</td><td>Porosity</td><td>%</td></tr><tr><td>12.</td><td>Water Holding Capacity</td><td>%</td></tr><tr><td>13.</td><td>Sodium Adsorption Ratio (SAR)</td><td>---</td></tr><tr><td>14.</td><td>Available Nitrogen as N</td><td>kg/ha</td></tr><tr><td>15.</td><td>Available Potassium as K<sup>++</sup></td><td>kg/ha</td></tr><tr><td>16.</td><td>Available Sodium as Na<sup>++</sup></td><td>kg/ha</td></tr><tr><td>17.</td><td>Exchangeable Calcium as Ca<sup>++</sup></td><td>mg/kg</td></tr><tr><td>18.</td><td>Exchangeable Magnesium as Mg<sup>++</sup></td><td>mg/kg</td></tr><tr><td>19.</td><td>Available Phosphorus as P</td><td>kg/ha</td></tr><tr><td>20.</td><td>Cation Exchange Capacity</td><td>meq/100gm</td></tr><tr><td colspan="3">HEAVY METALS</td></tr><tr><td>21.</td><td>Lead (Pb)</td><td>mg/kg</td></tr><tr><td>22.</td><td>Cadmium (Cd)</td><td>mg/kg</td></tr><tr><td>23.</td><td>Chromium (Cr)</td><td>mg/kg</td></tr><tr><td>24.</td><td>Iron (Fe)</td><td>mg/kg</td></tr><tr><td>25.</td><td>Nickel (Ni)</td><td>mg/kg</td></tr><tr><td>26.</td><td>Zinc (Zn)</td><td>mg/kg</td></tr><tr><td>27.</td><td>Manganese (Mn)</td><td>mg/kg</td></tr><tr><td>28.</td><td>Copper (Cu)</td><td>mg/kg</td></tr><tr><td>29.</td><td>Arsenic (As)</td><td>mg/kg</td></tr><tr><td>30.</td><td>Mercury (Hg)</td><td>mg/kg</td></tr></table> | Sr. No.           | Parameters | Unit | 1. | pH at 25°C | --- | 2. | Colour | --- | 3. | Texture | --- | 4. | Sand | % | 5. | Slit | % | 6. | Clay | % | 7. | Electric Conductance at 25°C | mS/cm | 8. | Total Organic Matter | % | 9. | Organic Carbon | % | 10. | Bulk Density | g/cm <sup>3</sup> | 11. | Porosity | % | 12. | Water Holding Capacity | % | 13. | Sodium Adsorption Ratio (SAR) | --- | 14. | Available Nitrogen as N | kg/ha | 15. | Available Potassium as K <sup>++</sup> | kg/ha | 16. | Available Sodium as Na <sup>++</sup> | kg/ha | 17. | Exchangeable Calcium as Ca <sup>++</sup> | mg/kg | 18. | Exchangeable Magnesium as Mg <sup>++</sup> | mg/kg | 19. | Available Phosphorus as P | kg/ha | 20. | Cation Exchange Capacity | meq/100gm | HEAVY METALS |  |  | 21. | Lead (Pb) | mg/kg | 22. | Cadmium (Cd) | mg/kg | 23. | Chromium (Cr) | mg/kg | 24. | Iron (Fe) | mg/kg | 25. | Nickel (Ni) | mg/kg | 26. | Zinc (Zn) | mg/kg | 27. | Manganese (Mn) | mg/kg | 28. | Copper (Cu) | mg/kg | 29. | Arsenic (As) | mg/kg | 30. | Mercury (Hg) | mg/kg |
| Sr. No.                          | Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Unit              |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 1.                               | pH at 25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ---               |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 2.                               | Colour                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ---               |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 3.                               | Texture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ---               |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 4.                               | Sand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | %                 |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 5.                               | Slit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | %                 |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 6.                               | Clay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | %                 |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 7.                               | Electric Conductance at 25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | mS/cm             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 8.                               | Total Organic Matter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | %                 |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 9.                               | Organic Carbon                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | %                 |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 10.                              | Bulk Density                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | g/cm <sup>3</sup> |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 11.                              | Porosity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | %                 |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 12.                              | Water Holding Capacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | %                 |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 13.                              | Sodium Adsorption Ratio (SAR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ---               |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 14.                              | Available Nitrogen as N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | kg/ha             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 15.                              | Available Potassium as K <sup>++</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | kg/ha             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 16.                              | Available Sodium as Na <sup>++</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | kg/ha             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 17.                              | Exchangeable Calcium as Ca <sup>++</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 18.                              | Exchangeable Magnesium as Mg <sup>++</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 19.                              | Available Phosphorus as P                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | kg/ha             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 20.                              | Cation Exchange Capacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | meq/100gm         |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| HEAVY METALS                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 21.                              | Lead (Pb)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 22.                              | Cadmium (Cd)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 23.                              | Chromium (Cr)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 24.                              | Iron (Fe)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 25.                              | Nickel (Ni)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 26.                              | Zinc (Zn)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 27.                              | Manganese (Mn)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 28.                              | Copper (Cu)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 29.                              | Arsenic (As)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |
| 30.                              | Mercury (Hg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | mg/kg             |            |      |    |            |     |    |        |     |    |         |     |    |      |   |    |      |   |    |      |   |    |                              |       |    |                      |   |    |                |   |     |              |                   |     |          |   |     |                        |   |     |                               |     |     |                         |       |     |                                        |       |     |                                      |       |     |                                          |       |     |                                            |       |     |                           |       |     |                          |           |              |  |  |     |           |       |     |              |       |     |               |       |     |           |       |     |             |       |     |           |       |     |                |       |     |             |       |     |              |       |     |              |       |

Table 1- 1: Soil Sampling Locations

| Monitoring Location | Geo-coordinates (Lat, Long) | Chainage (approx., km) | Justification                                                                                                                                                            |
|---------------------|-----------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SQ1                 | 25.368138, 86.465100        | 0.00                   | Baseline point at start of corridor; establishes pre-construction soil quality reference (control point) against which impacts at downstream chainages can be compared   |
| SQ2                 | 25.348623, 86.550698        | 8.87                   | Represents agricultural stretch                                                                                                                                          |
| SQ3                 | 25.291125, 86.585951        | 16.18                  | Sampled to represent soil characteristics over an intermediate stretch of the alignment and to capture spatial variability in soil type/texture along the corridor       |
| SQ4                 | 25.242251, 86.701357        | 28.99                  | Covers alignment shift/curvature zone                                                                                                                                    |
| SQ5                 | 25.252052, 86.769520        | 35.94                  | Approach to Bhagalpur; peri-urban zone                                                                                                                                   |
| SQ6                 | 25.294700, 86.877384        | 47.77                  | Selected to capture soil conditions in the approach to a more densely settled/peri-urban stretch.                                                                        |
| SQ7                 | 25.262064, 86.961868        | 57.01                  | Close to Bhagalpur city; higher anthropogenic influence, proximity to sensitive receptors, and potential for existing soil contamination from urban/industrial activity. |
| SQ8                 | 25.249825, 87.053864        | 66.36                  | Baseline point at end of corridor                                                                                                                                        |

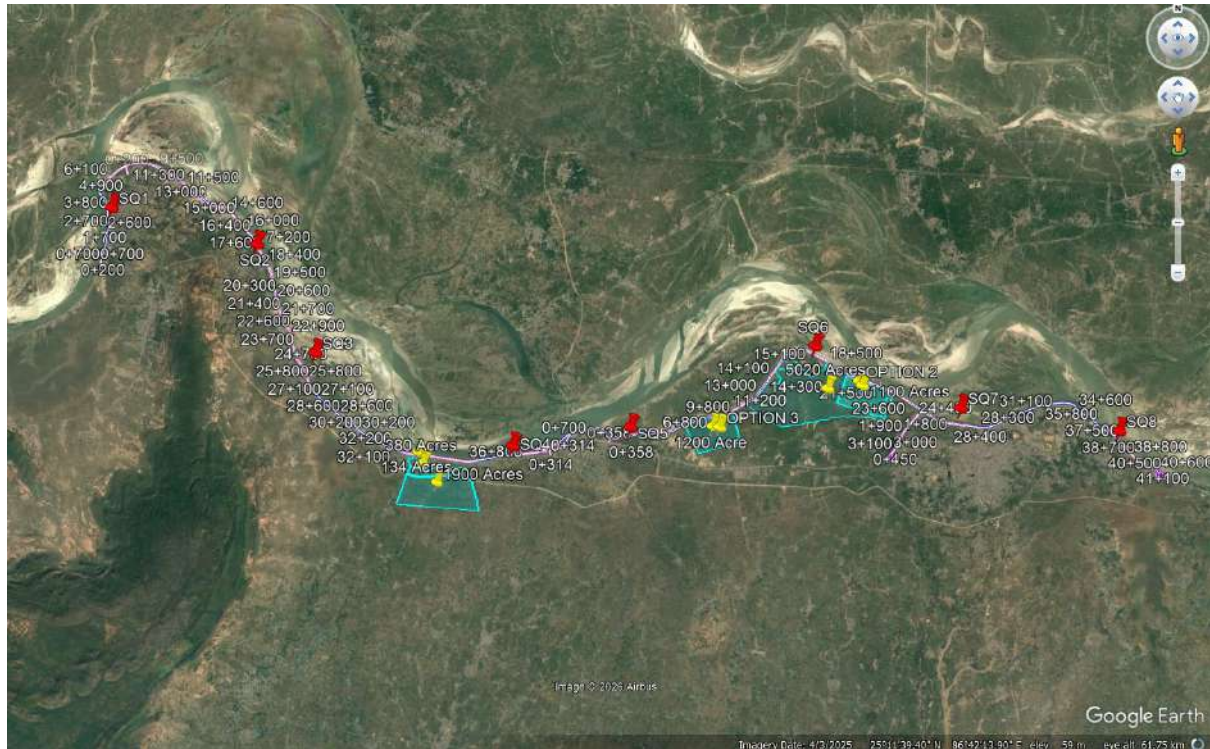


Figure 1- 2: Soil Sampling locations in and around (0.5 Km study area) from proposed site

## 2. METEOROLOGY

Assessment of micro and macro meteorology is important from the standpoint of understanding the nature and extent of air pollution in the study area. Building of pollution may impact climate irreversibly. Winter is critical for air pollution build-up because of frequent calm conditions with temperature inversions resulting in poor atmospheric mixing, natural ventilation resulting in an increased emission load. The impact on air environment would depend and has been identified based on identification of sources of air pollution from various process operations; the nature of pollutants and their quantities likely to be discharged to the atmosphere.

In India, the year may broadly be divided into four seasons:

- ✚ Winter: December to February
- ✚ Summer: March to May
- ✚ Monsoon: June to September
- ✚ Post-Monsoon: October to November

### Climate

The Bhagalpur and Munger districts of Bihar have a humid subtropical climate with three major seasons and a short transition (post-monsoon) period. For EIA studies, baseline environmental monitoring, and impact assessment, the following seasonal classification is generally adopted.

| Season                                          | Months              | General Characteristics                                                                                             | Average Temperature |
|-------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Winter</b>                                   | December – February | Cool, dry weather with occasional fog during mornings. Lowest rainfall.                                             | 8–25°C              |
| <b>Summer (Pre-monsoon)</b>                     | March – May         | Hot and dry. High solar radiation, dust, and occasional thunderstorms ("Kalbaisakhi/Nor'westers") during April–May. | 25–42°C             |
| <b>South-West Monsoon</b>                       | June – September    | Heavy rainfall, high humidity, frequent cloud cover, and occasional flooding along the Ganga and low-lying areas.   | 26–35°C             |
| <b>Post-Monsoon (Retreating Monsoon/Autumn)</b> | October – November  | Rainfall decreases rapidly, humidity reduces, pleasant weather begins.                                              | 18–32°C             |

### Approximate Climatic Characteristics

| Parameter               | Winter   | Summer                           | Monsoon                                | Post-Monsoon |
|-------------------------|----------|----------------------------------|----------------------------------------|--------------|
| Temperature             | 8–25°C   | 25–42°C                          | 26–35°C                                | 18–32°C      |
| Relative Humidity       | 45–70%   | 35–60%                           | 75–95%                                 | 50–75%       |
| Rainfall                | Very low | Low to moderate (thundershowers) | High (about 80–90% of annual rainfall) | Low          |
| Dominant Wind Direction | NW–NE    | W–NW                             | SE–SW                                  | NE–NW        |

### Annual Rainfall

- Bhagalpur: Approximately 1,100–1,300 mm/year
- Munger: Approximately 1,000–1,200 mm/year
- Nearly 80–90% of the annual rainfall occurs during the South-West Monsoon (June to September).

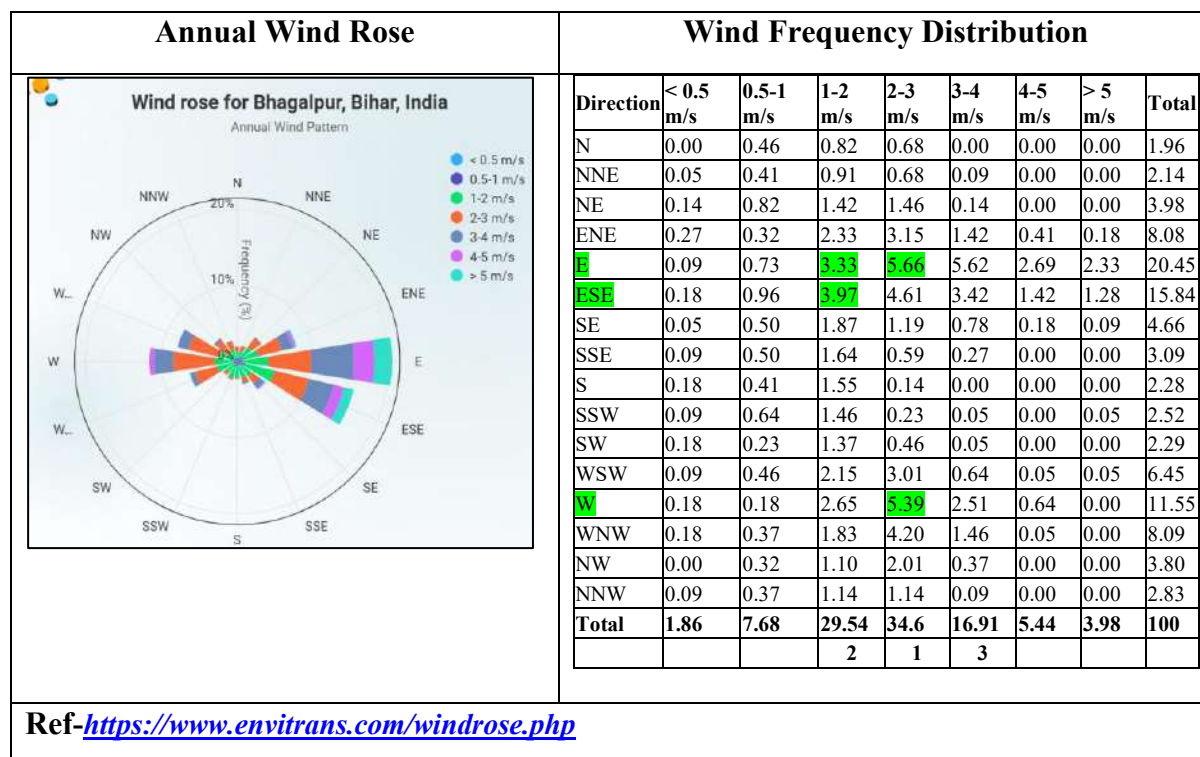
### Recommended Seasons for EIA Baseline Monitoring

| Environmental Component | Preferred Monitoring Season                                                       |
|-------------------------|-----------------------------------------------------------------------------------|
| Air Quality             | Summer (March–May) or Winter (December–February), avoiding heavy monsoon rainfall |
| Surface Water           | Pre-monsoon and post-monsoon                                                      |
| Groundwater             | Pre-monsoon and post-monsoon                                                      |
| Noise                   | Any season except periods of heavy rainfall                                       |
| Soil                    | Pre-monsoon or post-monsoon                                                       |
| Ecology                 | Monsoon and post-monsoon for vegetation assessment                                |

This seasonal classification is consistent with the climatology of the middle Ganga basin and is suitable for environmental baseline studies and EIA reports for projects in the Bhagalpur–Munger corridor.

## Wind Rose

### 1. Annual Wind Rose



Based on the wind frequency tables provided in your Bhagalpur Wind Rose Diagram document, the wind rose can be interpreted as follows

### Annual Wind Rose Description

The annual wind rose indicates that the easterly (E) wind is the predominant wind direction in the Bhagalpur region, accounting for 20.45% of the total observations, followed by east-south-easterly (ESE) winds (15.84%). Moderate contributions are also observed from the westerly (W) direction (11.55%), while ENE (8.08%) and WNW (8.09%) directions contribute almost equally. Winds from the northern and southern sectors occur less frequently, each generally contributing less than 5% of the annual observations.

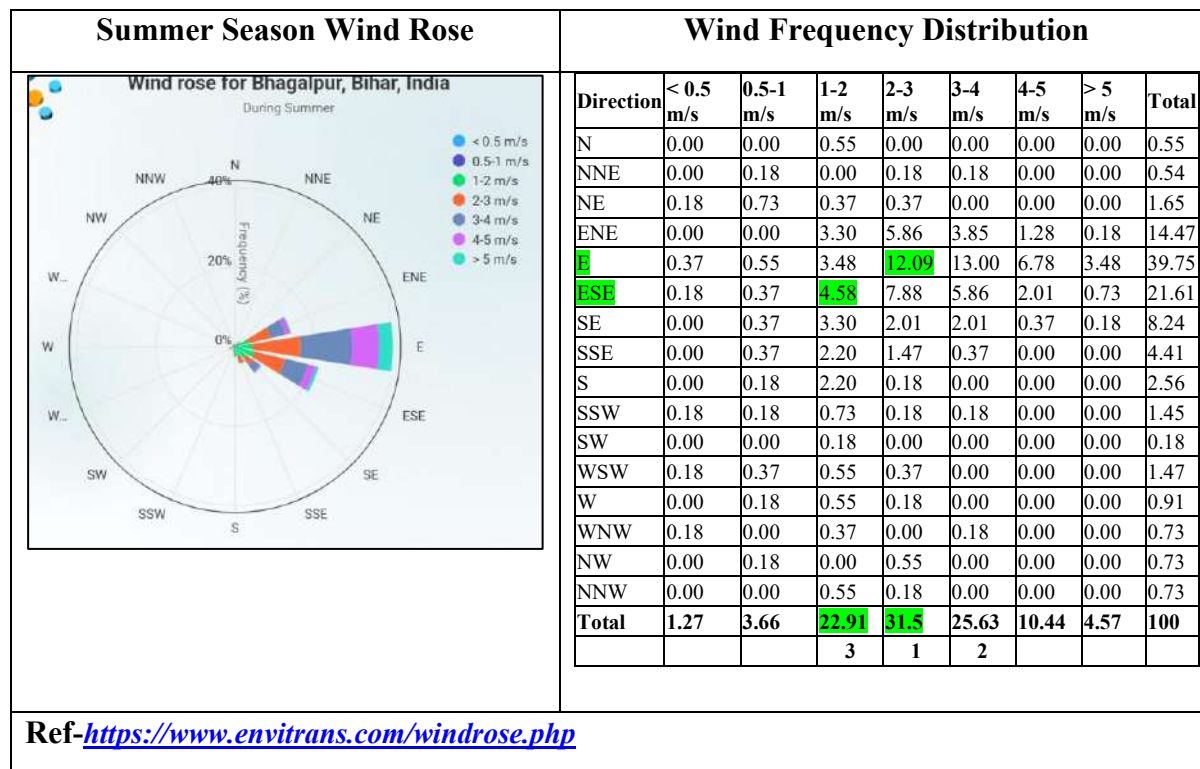
The majority of the recorded wind speeds fall within the 2–3 m/s (34.60%) and 1–2 m/s (29.54%) classes, together accounting for approximately 64% of the annual observations. Higher wind speeds of 3–4 m/s constitute 16.91%, whereas wind speeds exceeding 5 m/s are relatively infrequent (3.98%). These observations indicate that Bhagalpur generally experiences light to moderate winds, providing moderate atmospheric dispersion conditions throughout the year.

### Interpretation

The predominance of easterly winds indicates that any emissions generated from the project site are likely to be transported towards the western sector during most of the year. Therefore, sensitive receptors located west of the project site should receive particular attention during impact assessment and air quality modelling.

## Seasonal Wind Rose

### 2. Summer Wind Rose Description



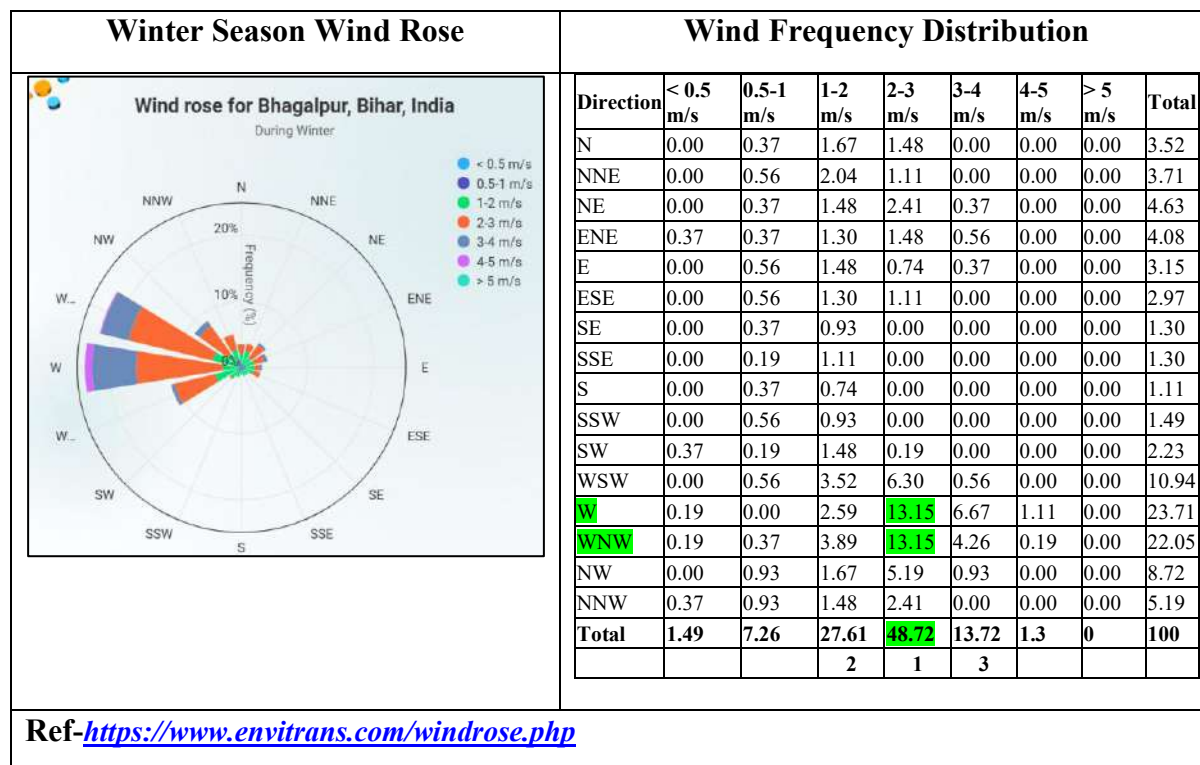
The summer wind rose shows a pronounced dominance of easterly (E) winds, representing 39.75% of the total observations, followed by east-south-easterly (ESE) winds at 21.61% and east-north-easterly (ENE) winds at 14.47%. Together, these easterly sectors account for more than 75% of the observed wind directions during summer, indicating a highly consistent seasonal airflow from the east.

Wind speeds during summer are comparatively stronger than the annual average. The 2–3 m/s category remains dominant (31.50%), followed by 3–4 m/s (25.63%), while 10.44% of observations occur within the 4–5 m/s range and 4.57% exceed 5 m/s. This indicates enhanced atmospheric mixing and pollutant dispersion during the summer months.

### Interpretation

During summer, pollutants emitted from the project area will predominantly disperse towards the western and north-western sectors due to persistent easterly winds. The relatively higher wind speeds favour better dilution of pollutants, thereby reducing the likelihood of localized pollutant accumulation.

### 3. Winter Season Wind Rose Description



The winter wind rose demonstrates a marked shift in the prevailing wind direction compared to summer. During winter, westerly (W) winds dominate with a frequency of 23.71%, closely followed by west-north-westerly (WNW) winds (22.05%). West-south-westerly (WSW) winds contribute 10.94%, while north-west (NW) winds account for 8.72%. Collectively, the western sector represents the predominant airflow during the winter season.

Most winter wind speeds are concentrated within the 2–3 m/s class (48.72%), followed by the 1–2 m/s class (27.61%). Higher wind speeds are relatively uncommon, with only 1.30% of observations occurring within the 4–5 m/s range and no observations exceeding 5 m/s. These conditions indicate generally light to moderate winds, which, when combined with the relatively stable winter atmosphere, may reduce pollutant dispersion efficiency.

#### Interpretation

During winter, emissions from the project are expected to be transported mainly towards the eastern sector because of the predominance of westerly winds. Although wind speeds are mostly moderate, winter atmospheric stability may lead to comparatively higher ground-level pollutant concentrations than in summer. Consequently, sensitive receptors located east of the project site should be carefully evaluated during air quality impact assessment.

### Overall Interpretation for Air Dispersion Modelling

| Season | Prevailing Wind Direction       | Dominant Wind Speed | Expected Pollutant Transport    |
|--------|---------------------------------|---------------------|---------------------------------|
| Annual | East (E), East-South-East (ESE) | 2–3 m/s             | Towards the west                |
| Summer | East (E), ESE, ENE              | 2–4 m/s             | Towards the west and north-west |
| Winter | West (W), WNW, WSW              | 2–3 m/s             | Towards the east                |

### Conclusion:

The wind rose analysis indicates a clear seasonal reversal in wind direction over the Bhagalpur region. Easterly winds dominate during the annual and summer periods, whereas westerly winds prevail during winter. This seasonal variation should be incorporated into air dispersion modelling (e.g., AERMOD) and considered while identifying sensitive receptors and interpreting predicted ground-level concentrations in the Environmental Impact Assessment (EIA).

### 3. AMBIENT AIR ENVIRONMENT

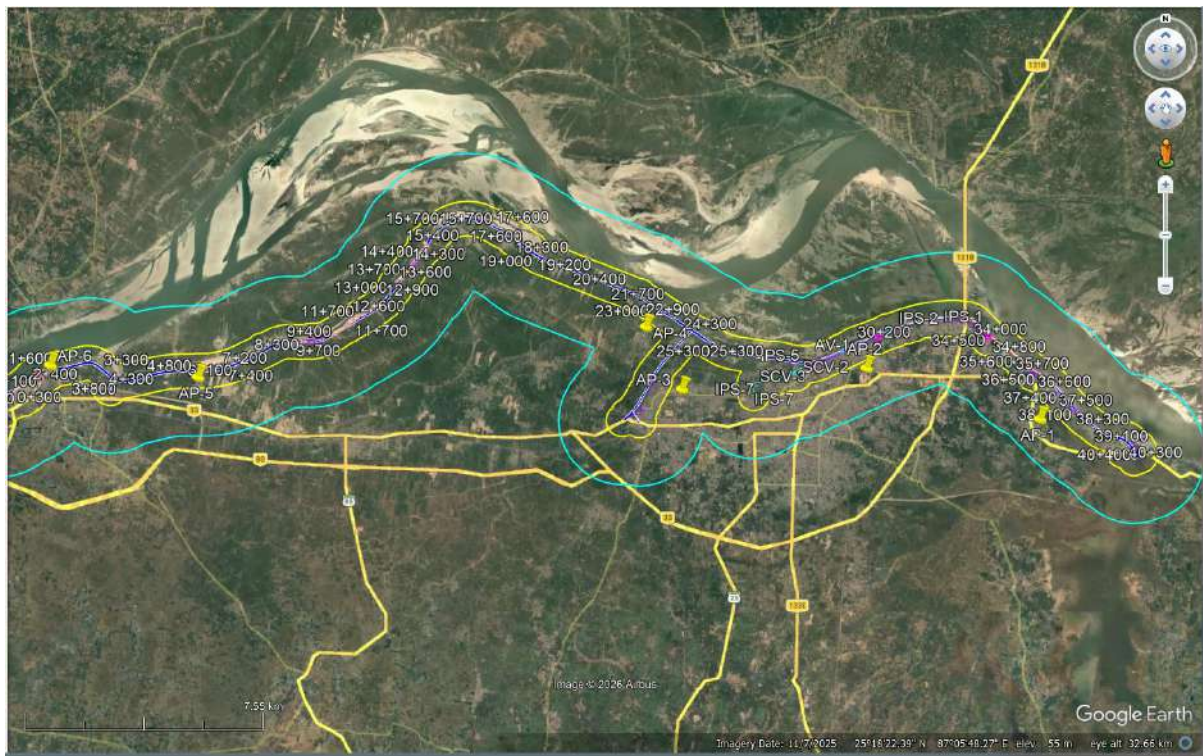
Details of ambient air quality monitoring to be carried out and details are mentioned below:

|                                        |                                                                                                                                                                                             |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Number of stations:</b>             | 8 locations in & around project site                                                                                                                                                        |
| <b>Duration and Sampling Frequency</b> | Twice in week on consecutive days throughout the monitoring period i.e., Summer Season (for three months period from- 2nd March 2026 to 26th May 2026)                                      |
| <b>Parameters</b>                      | Selected parameters [PM10, PM2.5, SO <sub>2</sub> , NO <sub>2</sub> , O <sub>3</sub> , CO] mentioned under National Ambient Air Quality Standards through Notification Dt- 18 November-2009 |
| <b>Method of sampling and Analysis</b> | As per the methods suggested by CPCB under NAAQS/ Standard Methods                                                                                                                          |
| <b>Other Details</b>                   | Identification of air pollution sources, significant environmental features, location of sensitive features.                                                                                |

**Table 1- 2: Details of AAQ Monitoring Stations / Locations**

| Moni Location | Locations                                                                         | Geo Coordinates                | Chainage | Remarks                                                                         |
|---------------|-----------------------------------------------------------------------------------|--------------------------------|----------|---------------------------------------------------------------------------------|
| AP-1          | Bihar Agricultural University<br>Bhagalpur Rd<br>Bhagalpur-813210(Bihar)          | 25°14'17.61"N<br>87° 2'57.43"E | 38+000   | Bihar Agri. University<br>Bhagalpur                                             |
| AP-2          | Sandy's Compound<br>NH-80, Katahalbari,<br>Khanjarpur,<br>Bhagalpur-812001(Bihar) | 25°15'9.55"N<br>86°59'41.64"E  | 30+300   | Residential areas, at<br>Bhagalpur                                              |
| AP-3          | CTS Field - Athletic field<br>Nathnagar,<br>Bhagalpur-812004                      | 25°14'47.98"N<br>86°56'13.68"E | 25+400   | St. Paul's School,<br>Regional forensic sci.<br>lab, MTN Ghosh Rd.              |
| AP-4          | Near Mansa Devi Mandir<br>Ajmeri pur, Gosaidas Pur-<br>812004 (Bihar)             | 25°15'51.41"N<br>86°55'33.02"E | 23+700   |                                                                                 |
| AP-5          | Tilakpur-813213 (Bihar)                                                           | 25°14'59.71"N<br>86°47'8.20"E  | 6+300    | RMC plant and<br>HEMM maintenance<br>yard                                       |
| AP-6          | Namami Ganga Ghat,<br>Sultanganj- 813213 (Bihar)                                  | 25°15'11.59"N<br>86°44'21.09"E | 1+500    | Namami Ganga Ghat<br>+Ajaivinath Temple<br>Ghat Rd, Sultanganj,<br>Bihar 813213 |
| AP-7          | Near Shiv mandir - Hindu<br>temple<br>Masdi-813213, (Bihar)                       | 25°14'30.83"N<br>86°42'59.62"E | 40+800   | Residential area<br>Bhagalpur-Munger<br>Rd-NH-33                                |

|              |                                                                                        |                                |        |                                                               |
|--------------|----------------------------------------------------------------------------------------|--------------------------------|--------|---------------------------------------------------------------|
| <b>AP-8</b>  | Akki Cricket - Cricket ground<br>Kamarganj, Sultanganj-813213 (Bihar)                  | 25°14'20.95"N<br>86°41'3.45"E  | 37+500 | Near Ma Durga Temple, Yatra Place                             |
| <b>AP-9</b>  | Near Bhagwati ashthan paswan tola<br>ghorghat - Hindu temple<br>Katgala-811211 (Bihar) | 25°14'35.81"N<br>86°38'4.11"E  | 32+600 | NH-33 + Coal yard+ Proposed elevated road portion             |
| <b>AP-10</b> | Near Badi Durga Mandir, Kalyanpur, Karhariya (South), Gangania, (Bihar) 811211         | 25°15'15.01"N<br>86°36'48.25"E | 30+100 | Durga Temple+ NH-33 + Munger-Mirzachauki Highway              |
| <b>AP-11</b> | Government Hospital Bariyarpur Block-811211, Bihar                                     | 25°17'1.71"N<br>86°34'30.37"E  | 25+500 | Brick Klins, NH-33, SH-333, Bariyarpur Stn,                   |
| <b>AP-12</b> | Munger Forestry Govt. College<br>Industrial area, Munger, Sikandrapur-811202 (Bihar)   | 25°22'16.51"N<br>86°30'19.95"E | 12+500 | Industrial area, Forestry College, ITI college Rd., 333B Rd., |
| <b>AP-13</b> | Near Hanuman Mandir, Fauzdari Bazar, Munger, Maksuspur<br>Munger-811201, (Bihar)       | 25°21'32.24"N<br>86°28'11.35"E | 2+500  | Munger Rd., Kasim Bazar Rd.,Brick Klins                       |



AAQ Monitoring Stations (Stations AP-1 to AP-6).



AAQ Monitoring Stations (Stations AP-7 to AP-13).

Figure 1- 3: Air Sampling location in and around (2 Km study area) from proposed site

#### 4. AMBIENT NOISE ENVIRONMENT

|                                        |                                                                             |
|----------------------------------------|-----------------------------------------------------------------------------|
| <b>Number of stations:</b>             | 13 locations in & around project site                                       |
| <b>Duration and Sampling Frequency</b> | Monthly basis for monitoring period i.e., Summer Season (20-24 April- 2026) |
| <b>Parameters</b>                      | 24 hourly Day & Night Noise Levels [Lmin, Lmax, Lavg, L10, L50, and L90]    |
| <b>Method of sampling and Analysis</b> | IS: 4954 as adopted by CPCB                                                 |

Table 1- 3: Noise Monitoring Locations

| Location code | Name of Monitoring Locations                                                                       | Noise Zone                  | Latitude/ Longitude            | Distance (in Km) / Direction                                              |
|---------------|----------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------|---------------------------------------------------------------------------|
| N-1           | Shastri General and kirana store<br>Farka, Sabour, Bihar 813205                                    | Residential                 | 25°13'59.44"N<br>87° 4'30.82"E | 275m / (205 <sup>0</sup> ) (from Chainage 40+100)                         |
| N-2           | Rajandipur Kapuri<br>Shiv Mandir<br>Deekshapuram<br>Bhagalpur-813210, (Near Ganga Ghat Rajandipur) | Residential/<br>Commercial  | 25°14'37.40"N<br>87° 3'34.32"E | 148m/ (235 <sup>0</sup> ) (from Chainage 38+200)                          |
| N-3           | Near Barari Ghat,<br>Barari Rd<br>Bhagalpur, Bihar 812003                                          | Residential /<br>Commercial | 25°16'2.84"N<br>87° 1'31.29"E  | 330m/(215 <sup>0</sup> ) (from Chainage 33+800)                           |
| N-4           | Mayaganj Govt. Hospital, Mayaganj<br>Bhagalpur, Bihar 812001                                       | Silent                      | 25°15'50.97"N<br>87° 0'6.80"E  | 200m/(168 <sup>0</sup> ) (from Chainage 31+100)                           |
| N-5           | Shankerpur Bind Tola, Parnathpur, Bihar 812002                                                     | Silent                      | 25°15'17.94"N<br>86°57'44.71"E | 424m/(198 <sup>0</sup> ) (from Chainage 27+100)<br>Near Construction yard |
| N-6           | Bishanpur<br>Shahzadpur, Bihar 812004                                                              | Residential                 | 25°17'26.96"N<br>86°52'57.57"E | 308m/(205 <sup>0</sup> ) (from Chainage 18+100) In villege                |
| N-7           | Ajaigaivinath<br>Parvati temple<br>Sultanganj, Bihar 813213                                        | Silent /<br>Commercial      | 25°15'7.74"N<br>86°44'4.33"E   | 124m/(170 <sup>0</sup> ) (from Chainage 0+900)<br>beside the Temple       |

|      |                                                                               |                      |                                |                                                                              |
|------|-------------------------------------------------------------------------------|----------------------|--------------------------------|------------------------------------------------------------------------------|
| N-8  | Kamarganj Viilage, Sultanganj, Bihar 813213                                   | Residential          | 25°14'24.51"N<br>86°41'16.64"E | 105m/(153 <sup>0</sup> ) (from Chainage 37+800) in Villege                   |
| N-9  | Adarsh Higher secondary school Karhariya (South), Bihar 811211                | Silent / Residential | 25°14'35.04"N<br>86°37'56.94"E | 376m/(200 <sup>0</sup> ) (from Chainage 32+300) in Villege                   |
| N-10 | Mahavir Mandir Fulkiya, Nurpur, Gangania-811211, Bihar                        | Silent / Residential | 25°15'42.26"N<br>86°36'4.79"E  | 237m/(210 <sup>0</sup> ) (from Chainage 28+600) in Villege                   |
| N-11 | Philip High School Bariarpur-811211 (Bihar)                                   | Silent               | 25°17'9.42"N<br>86°34'39.84"E  | 436m/(230 <sup>0</sup> ) (from Chainage 25+100) in School premises           |
| N-12 | Madhya Vidyalaya Terasi Devatola Ajodhya Sikandrapur-811202 (Bihar)           | Silent               | 25°22'43.03"N<br>86°30'51.90"E | 284m/(210 <sup>0</sup> ) (from Chainage 12+200) near school premises         |
| N-13 | Near Hanuman Mandir, Fauzdari Bazar, Munger, Maksuspur Munger-811201, (Bihar) | Silent / Residential | 25°21'31.82"N<br>86°28'11.29"E | 536m/(99 <sup>0</sup> ) (from Chainage 2+500) near temple / residential area |



Ambient Noise Monitoring Stations (Stations N-1 to N-6).



Ambient Noise Monitoring Stations (Stations N-7 to N-13).

Figure 1- 4: Noise monitoring locations in and around (0.5km study area) Parallel to proposed road site

## 5. WATER QUALITY

Details of surface sampling locations of Ganga River, are given in **Table no-1-4** whereas presented in **Figure no – 1-5** and GW details are given in **Table no-1-4** whereas presented in **Figure no – 1-6**.

07 nos. of Surface water samples taken from Ganga River from different places whereas 04 nos. Ground Water locations will be selected based on availability (in and around the project site) and conveyed to the laboratory for sampling at the time of other samplings.

Suggested Parameters for Water Quality Monitoring are mentioned in **Table 1-5**.

**Monitoring Period-** 13-17 April- 2026.

**Table 1- 4: Surface Water Quality Monitoring Location**

| Location Code                                                                               | Criteria                                                                            | Latitude      | Longitude     | Distance from project site                                                                       |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------|---------------|--------------------------------------------------------------------------------------------------|
| <b>Surface Water Quality Monitoring Location</b>                                            |                                                                                     |               |               |                                                                                                  |
| SW-1                                                                                        | Upstream of Munger / Proposed project                                               | 25°19'46.81"N | 86°26'57.88"E | 1.7 km/N (221 <sup>0</sup> )                                                                     |
| SW-2                                                                                        | Beside the city                                                                     | 25°22'34.38"N | 86°27'37.14"E | 216m/ (266 <sup>0</sup> ) (from Chainage 4+400)<br>Near pumping station, Babua Ghat, Munger Fort |
| SW-3                                                                                        | Downstream of Munger                                                                | 25°19'35.38"N | 86°34'25.83"E | 959m/ (88 <sup>0</sup> ) (from Chainage 20+400)                                                  |
| SW-4                                                                                        | Upstream of Sultanganj                                                              | 25°15'7.63"N  | 86°43'33.53"E | 381m/(331 <sup>0</sup> ) (from Chainage 0+100)                                                   |
| SW-5                                                                                        | Downstream of Sultanganj                                                            | 25°16'4.17"N  | 86°46'8.54"E  | 381m/(331 <sup>0</sup> ) (from Chainage 0+100)                                                   |
| SW-6                                                                                        | Upstream of Bhagalpur (VSS)                                                         | 25°17'28.34"N | 86°54'28.07"E | 956m/(19 <sup>0</sup> ) (from Chainage 20+500)                                                   |
| SW-7                                                                                        | Downstream of Bhagalpur (VSS)                                                       | 25°14'4.89"N  | 87° 5'40.33"E | 1.4km/(770) (from Chainage 40+700)                                                               |
| <b>Ground Water Quality Monitoring Location</b>                                             |                                                                                     |               |               |                                                                                                  |
| Will consider after discussion with project proponent and related survey / ground troughing |                                                                                     |               |               |                                                                                                  |
| GW-1                                                                                        | Near Purani Ghat Fatehpur, Gangania - Hindu temple NH 33 Bihar Sharif, Bihar 811211 | 25°14'23.99"N | 86°39'41.05"E | 178m/(1970) (from Chainage 35+200)                                                               |
| GW-2                                                                                        | Prathmik Vidyalaya Sarswati Nagar Nurpur, Gangania, Bihar 811211                    | 25°15'55.26"N | 86°35'45.95"E | 253m/(2250) (from Chainage 28+000)                                                               |

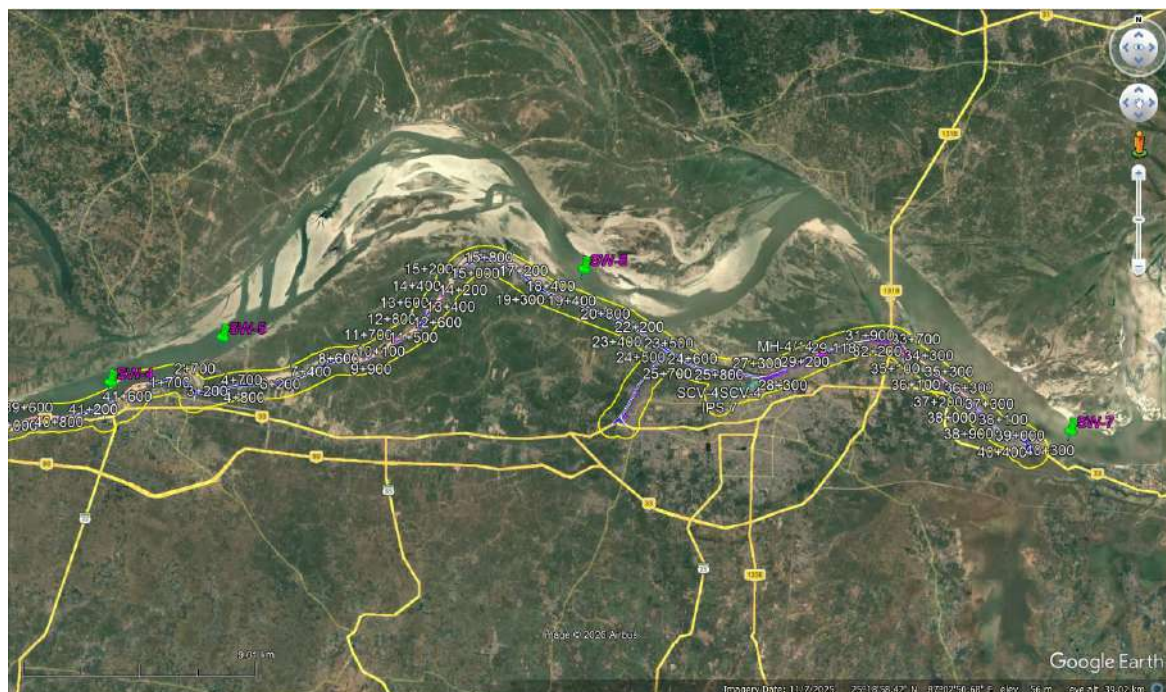
| Location Code | Criteria                                                     | Latitude     | Longitude     | Distance from project site         |
|---------------|--------------------------------------------------------------|--------------|---------------|------------------------------------|
| GW-3          | Near Sitla mandir,Bochahi Tilakpur Rd Tilakpur, Bihar 811211 | 25°20'4.89"N | 86°33'30.24"E | 351m/(2660) (from Chainage 19+400) |
| GW-4          | Near Ekanteshwar Mahadev Maksuspur Munger, Bihar 811202      | 25°21'1.26"N | 86°27'57.60"E | 349m/(1130) (from Chainage 1+600)  |

**Table 1- 5: Parameters for Surface & Ground Water Quality Analysis**

|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Number of stations:</b>             | Surface Water: 7<br>Ground Water: 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Frequency</b>                       | Two grab samples per location                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Duration</b>                        | Once in summer season (13-17 April- 2026)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Parameters</b>                      | <p><b>Surface Water: As per IS: 2296-1982</b><br/>           Colour, Odour, pH, Conductivity, TDS, Nitrite as NO<sub>2</sub>, Nitrates as NO<sub>3</sub>, Ortho Phosphate, Total Phosphate, Dissolved Oxygen, Chemical Oxygen Demand (COD), BOD, Potassium as K, Sodium as Na, Calcium as Ca, Magnesium as Mg, Cadmium as Cd, Selenium as Se, Arsenic as As<sup>+5</sup>, Lead as Pb<sup>+2</sup>, Zinc as Zn<sup>+2</sup>, Aluminum as Al<sup>+3</sup>, Boron as B, Mercury as Hg<sup>+2</sup>, Mineral Oil, Chromium as Cr<sup>+6</sup>, Total Hardness as CaCO<sub>3</sub>, Alkalinity as CaCO<sub>3</sub>, Carbonates as CO<sub>3</sub>, Bicarbonates as HCO<sub>3</sub>, Chlorides as Cl, Sulphates as SO<sub>4</sub>, Fluorides as F, E. Coli, and Fecal Coliform</p> <p><b>Ground Water: As per IS 10500: 2012/2018, (Drinking Water - Specification)</b><br/>           pH, Color, Odour, Taste, Turbidity, Total Hardness, Iron as Fe<sup>+2</sup> and Total, Chlorides, TDS, Residual Chlorine as Cl, Sodium as Na, Potassium as K, Calcium as Ca, Magnesium as Mg, Copper as Cu, Manganese as Mn, Sulphates as SO<sub>4</sub>, Nitrate as NO<sub>2</sub>, Total Phosphate Ortho Phosphate, Fluoride as F, Phenolic Compounds, Sulphide as (H<sub>2</sub>S), Cadmium as Cd, Selenium as Se, Arsenic as As<sup>+5</sup>, Lead as Pb<sup>+2</sup>, Zinc as Zn<sup>+2</sup>, Alkalinity as CaCO<sub>3</sub>, Aluminum as Al<sup>+3</sup>, Boron as B, Mercury as Hg<sup>+2</sup>, Mineral Oil, Total Chromium as Cr<sup>+6</sup>, Chloramines as Cl<sub>2</sub>, Nickel as Ni, Molybdenum as Mo, Barium as Ba, Silver as Ag, Calcium as Ca, Magnesium as Mg, E. Coli, and Fecal Coliform</p> |
| <b>Method of sampling and Analysis</b> | Standard methods for Examination of Water and Wastewater published by American Public Health Association (APHA)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



Surface Water Monitoring Stations (Stations SW-1 to SW-3).



Surface Water Monitoring Stations (Stations SW-4 to SW-7).

Figure 1- 5: Surface Water Quality Monitoring Locations (In Ganga River) Parallel to proposed Road Site



Figure 1- 6: Ground Water Quality Monitoring Locations