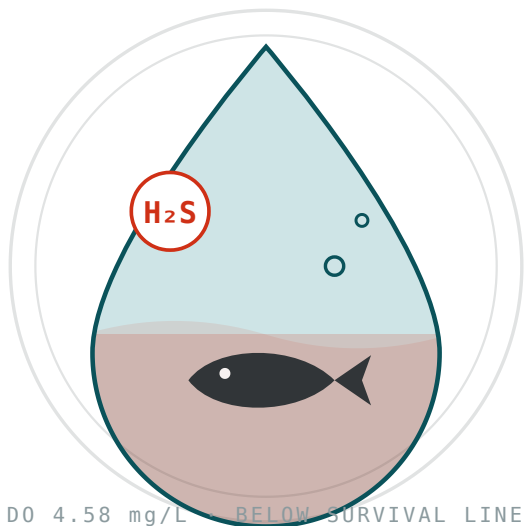


SCREENING-LEVEL ECOLOGICAL & HEALTH RISK ASSESSMENT

A river that can no longer *breathe*.

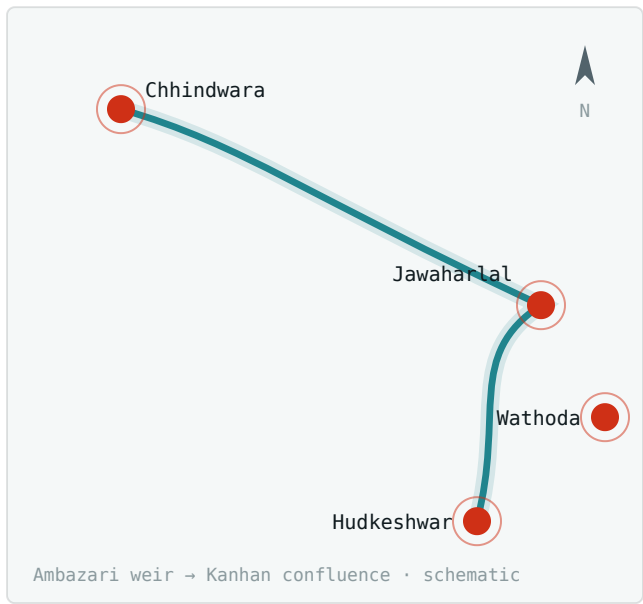
Four sampling runs along the Nag & Pili — once a drinking-water and migratory-bird habitat, now the stormwater drain for western Nagpur — were benchmarked against U.S. EPA aquatic-life criteria. Every site failed. The water now sits below CPCB Class E: **not fit for any use**.



<div>1,238×</div> <div>SULPHIDE</div> <div>over the 0.002 mg/L aquatic-life limit — the dominant toxic stressor</div>	<div>4 / 4</div> <div>SITES FAILING</div> <div>every location exceeds limits for TDS, TSS, BOD, sulphide & oil</div>	<div>2.8×</div> <div>DISSOLVED SOLIDS</div> <div>TDS averaged 1,415 mg/L against a 500 mg/L ceiling</div>	<div>~100</div> <div>MLD UNTREATED</div> <div>city sewage (420 MLD) outpaces treatment capacity</div>
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WHERE WE SAMPLED

17 KM THROUGH THE CITY

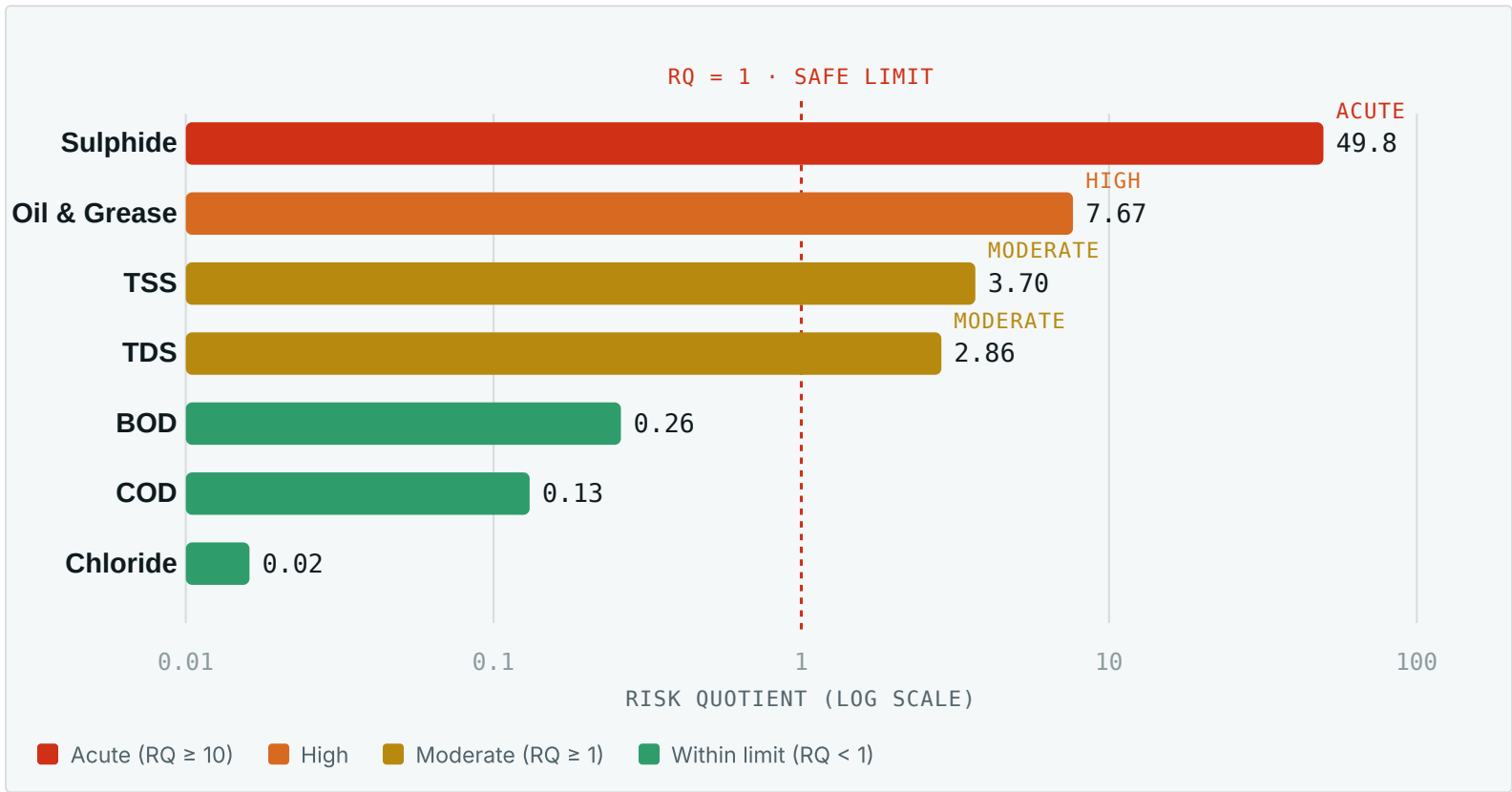


01 Chhindwara	21.2571°N · 79.0879°E
02 Jawaharlal	21.1622°N · 79.1385°E
03 Wathoda	21.1457°N · 79.1457°E
04 Hudkeshwar	21.0854°N · 79.1240°E

Surface-water grab samples at four urban discharge hotspots, analysed by APHA Standard Methods and benchmarked against EPA Ambient Water Quality & Effluent criteria where Indian numeric thresholds are absent.

WHAT WE FOUND

RISK QUOTIENT = OBSERVED ÷ SAFE LIMIT



PARAMETER	SITE AVG	EPA LIMIT	STATUS
Sulphide	2.475	0.002	Acute
Total Dissolved Solids	1,415	500	Exceeded
Total Suspended Solids	107.5	30	Exceeded
Oil & Grease	2.125	0.3	High
BOD	7.65	5*	Over eco-limit
Dissolved Oxygen	4.58	≥5	Below std
COD	32.3	250	Within
Chloride	3.7	230	Within

All values mg/L. *BOD stays below the 30 mg/L effluent limit but exceeds the 5 mg/L ecological threshold for healthy freshwater. Sulphide, suspended & dissolved solids and oil are the stressors driving the river past its ecological tipping point.

THE IMPACT

ONE CONTAMINATION CHAIN, THREE CASUALTIES

<div></div> <div>Aquatic collapse</div> <ul style="list-style-type: none">Hydrogen sulphide shuts down fish respiration — documented killsSensitive taxa (mayflies, stoneflies) displaced or lostHypoxia below 5 mg/L DO; eutrophication from organic load	<div></div> <div>Birds & wildlife</div> <ul style="list-style-type: none">Herons, kingfishers, painted storks feed on tainted fishOil films foul feathers; scum degrades nesting banksToxins bio-accumulate up the scavenger food chain	<div></div> <div>Human health</div> <ul style="list-style-type: none">Gastrointestinal illness & skin lesions from direct contactStagnant water breeds dengue & leptospirosis vectorsSubsistence fishing carries contaminants onto plates
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Feedback loop: Untreated sewage → river → aquatic life → birds & livestock → humans → shared habitat

WAYS TO RESOLVE

SOURCE CONTROL, NOT CLEAN-UP THEATRE

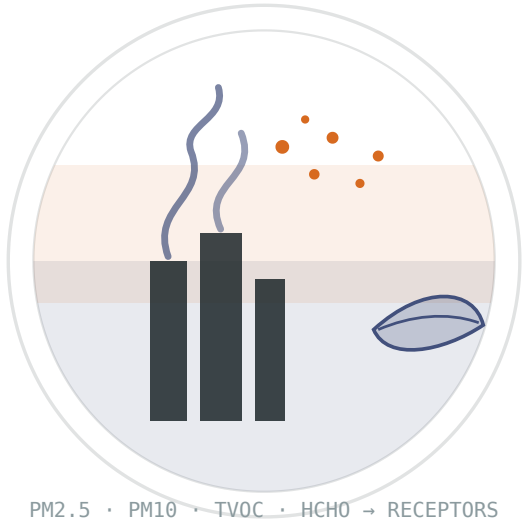
01 Decentralised sewage treatment Community-scale treatment first at Hudkeshwar & Chhindwara, where loads peak.	02 Stormwater–sewage separation Stop raw sewage mixing into stormwater drains across the western catchment.
03 Riparian bio-shields Mandated buffer green zones along banks for natural filtration & reaeration.	04 Live risk mapping High-risk zones piped into Nagpur Smart City dashboards for public oversight.
05 Public-health advisories Contact warnings & community hygiene stations to cut secondary illness.	06 Seasonal monitoring & wetland zoning Diurnal sampling with universities; Ramsar urban-wetland protection.

Source: Meshram & Shelke (2026), *Urban river pollution affects biodiversity, ecosystem integrity and human health in the Nag and Pili Rivers of Nagpur, India* — Discover Environment 4:330. Screening-level assessment (n = 4 sites); Risk Quotients are hazard flags, not regulatory determinations. Benchmarks used solely for screening comparison.

ONGOING · AUG 2026 – FEB 2027 · GOING LIVE

The pollution you *can't* see settling.

At MIDC Butibori — one of central India's largest industrial estates, on Nagpur's southern edge — we've begun a six-month air-monitoring campaign. Street-level sensors paired with satellite retrievals, calibrated against the CPCB reference station, streaming to a public live dashboard. The goal: trace the **silent effects** of industrial air on weather, biodiversity and people.



<div>6 mo</div> <div>CAMPAIGN</div> <div>continuous monitoring, Aug 2026 → Feb 2027</div>	<div>Live</div> <div>PUBLIC FEED</div> <div>readings streamed to an open dashboard</div>	<div>2-way</div> <div>METHOD</div> <div>ground sensors × satellite, CPCB-calibrated</div>	<div>3</div> <div>RECEPTORS</div> <div>weather, biodiversity & human health tracked together</div>
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THE SIX-MONTH ARC

STARTED AUGUST 2026

<div>AUG – SEP 2026</div> <div>NOW</div> <div>Deploy & calibrate</div> <div>Sensors sited across Butibori; co-located against the CPCB reference station.</div>	<div>OCT – NOV 2026</div> <div>Winter campaign</div> <div>Peak-season capture as cool, stagnant air traps particulates near ground.</div>	<div>DEC – JAN 2027</div> <div>Go live</div> <div>Readings published to a public dashboard; weather & exposure overlays.</div>	<div>FEB 2027</div> <div>Synthesis</div> <div>Health & biodiversity signal analysis; open dataset & findings release.</div>
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WHAT WE'RE MEASURING

STREET LEVEL × ORBIT

<div>PM2.5</div> <div>Fine particulates that reach deep into the lungs</div> <div>MG/M³ · GROUND</div>	<div>PM10 · PM1</div> <div>Coarse & ultrafine dust loads</div> <div>MG/M³ · GROUND</div>	<div>TVOC · HCHO</div> <div>Volatile organics & formaldehyde from industry</div> <div>PPB · GROUND</div>	<div>NO₂ · AOD</div> <div>Column pollutants from Sentinel-5P & MODIS</div> <div>SATELLITE</div>
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Portable monitors log PM, TVOC, HCHO, temperature & humidity in the field; satellite retrievals (Sentinel-5P TROPOMI, MODIS AOD) extend coverage; WHO AirQ+ translates exposure into health burden. Every sensor is calibrated against government reference instruments before its data counts.

THE SILENT EFFECTS WE'RE TRACING

WHAT THE NUMBERS DON'T SAY OUT LOUD

<div></div> <div>Weather coupling</div> <div><ul style="list-style-type: none">How temperature inversions & humidity trap pollution near groundWind direction carrying the industrial plume into neighbourhoodsSeasonal swings between monsoon washout & winter build-up</div>	<div></div> <div>Biodiversity</div> <div><ul style="list-style-type: none">Particulate films on leaves suppressing photosynthesisShifts in insect & bird activity near the industrial edgeSoil & water deposition far downwind of the stacks</div>	<div></div> <div>Human health</div> <div><ul style="list-style-type: none">Chronic low-dose exposure for workers & nearby residentsRespiratory & cardiovascular burden via WHO AirQ+ modellingWho is most exposed — mapped street by street</div>
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WHY IT MATTERS

EVIDENCE BEFORE IRREVERSIBILITY

Butibori's air has never been measured this closely, in public, with the weather and the wildlife read alongside the pollution. By the time the campaign closes in early 2027, Nagpur will have its first open, calibrated baseline of an industrial airshed — built, like our river work, to be copied by other cities.

Study: Climate Sentinel Foundation — MIDC Butibori Air Monitoring Campaign (Aug 2026 – Feb 2027), ongoing. Instruments calibrated against the CPCB National Ambient Air reference station, Nagpur. Figures on this page describe scope & method; results will publish openly on completion.