

Short answer: this is serious. Multiple volatile organic compounds (VOCs) at very high concentrations (including benzene up to ~6,200 µg/L), plus hydrocarbon/oil, dissolved methane and a range of toxic metals, phenols and sulphides in groundwater create clear risks to human health, buildings (vapour intrusion and explosion risk), and the environment. The site needs urgent professional assessment and likely remediation.

Key reasons why this is serious

- Benzene and other BTEX/metropolitan hydrocarbons at the concentrations reported are many times higher than typical drinking-water standards and represent a high human-health hazard (benzene is a known carcinogen). Even short-term high-level exposure can cause acute effects, and long-term exposure increases cancer risk.
- A mix of VOCs and oil in groundwater creates a vapour-intrusion risk to nearby enclosed spaces (offices, homes, basements): people can be exposed by breathing indoor air contaminated by soil gas; showering and household use also increase inhalation exposure.
- Dissolved methane in groundwater and soil gas can cause explosion/ignition hazards in confined spaces (buildings, service ducts, trenches).
- Metals such as arsenic, lead, mercury, cadmium, chromium and nickel cause chronic toxicity (neurological, renal, developmental and carcinogenic effects depending on metal and dose). Even if some metals were only "above detection" in the samples you quoted, combined contamination is a concern.
- Surface-water receptors (Birchenwood Brook) and ecological receptors are at risk from runoff, seeps and plume migration.
- Presence of phenols, sulphides and oil/grease increases smell/odour, toxicity and ecological harm, and complicates treatment.

Health effects — concise summary by contaminant group

- Benzene (very concerning): bone marrow suppression, anemia, immune suppression, increased lifetime risk of leukemia (carcinogenic). Acute high doses cause dizziness, unconsciousness.
- Other BTEX (toluene, ethylbenzene, xylenes): central nervous system effects (headache, dizziness), irritation; some are suspected reproductive/toxicants at high doses.
- Chlorinated hydrocarbons (e.g., dichloroethane, dichloropropane, chlorobenzenes): liver, kidney and nervous-system effects; some are probable/possible carcinogens with long-term exposure.
- Metals: arsenic (skin lesions, cancer, cardiovascular), lead (neurodevelopmental harm, especially children), mercury (neurological), cadmium (kidney damage), chromium VI (carcinogen), nickel (respiratory cancer risk with some forms) — chronic, serious effects depending on dose and exposure route.
- Methane: asphyxia in enclosed spaces at very high concentrations, and explosion/ignition hazard well before asphyxiation concentrations are reached if gas accumulates in structures.
- Phenols/sulphides/oil: skin and mucous membrane irritation, odour nuisance, toxicity to aquatic life.

Relative magnitude

- Drinking-water quality standards and guidance values for VOCs and metals are typically in the low micrograms per litre (µg/L) or even sub-µg/L range. The benzene value you quoted (thousands of µg/L) is therefore hundreds to thousands of times higher than typical limits — that is a severe exceedance.
- Even where exact guideline numbers vary by agency, the reported values are far above what's considered safe for potable water or for unrestricted use of the site.

Primary exposure pathways of concern

- Ingestion of contaminated groundwater (drinking).
- Inhalation of vapours from groundwater or contaminated soils entering buildings (vapour intrusion).
- Inhalation/dermal contact during site works (excavation, well sampling) or recreational contact.
- Ecological exposure via discharge to surface water/sediments.

Immediate practical precautions

- Do not use groundwater from the site for drinking, irrigation or domestic use until formal testing/mitigation is done.
- Prevent access to wells and shallow excavations; post warnings. Ensure workers use appropriate PPE and air monitoring.
- Test nearby potable supplies (domestic wells, supplies at risk) and provide alternate water if any contamination is found.
- If buildings are present, carry out a soil-gas / vapour-intrusion assessment before occupancy or reuse; ventilate/evacuate if strong odours or gas readings occur.
- Monitor methane and other combustible gases in confined spaces and during intrusive works.

Recommended next steps (technical response)