

Introduction to Environmental Technician

Introduction to Environmental Technician Problem Solving

Study guide – concise, organized, and ready for quick reference

1. What Is an Environmental Technician?

Aspect	Description
Role	Collects, analyzes, and interprets environmental data; implements field and laboratory procedures; supports compliance with regulations.
Typical Work Settings	• Government agencies (EPA, state health departments) • Consulting firms • Manufacturing plants • Waste management facilities • Observation & data recording
Core Competencies	• Instrument operation • Safety & regulatory awareness • Basic statistical analysis • Communication of findings

2. The Problem Solving Process (Six Step Model)

Step	Goal	Key Actions	Typical Tools
1. Identify the Problem	Clarify what needs to be solved.	• Review work orders, permits, or client requests. • Observe field conditions. • Ask “who, what, when, where, why, how?”	Checklists, field logs, GIS maps
2. Gather Information	Collect reliable data to define the scope.	• Sample water, soil, air, or waste. • Retrieve historical data & previous reports. • Interview stakeholders.	Sampling kits, calibrated meters, databases, SOPs

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Step	Goal	Key Actions	Typical Tools
Problem Solving			
1. Define the Problem	Identify the issue and its scope.	• Gather information and data (e.g., GC?	
2. Plan the Investigation	Determine what needs to be done and how.	• Develop a testing strategy (e.g., MS, spectrophotometry).	
3. Analyze Data	Turn raw numbers into meaningful insight.	• Use QA/QC procedures (blanks, duplicates). • Apply basic statistics (mean, SD, trend lines). • Compare results to standards (e.g., NPDES, OSHA).	Excel, R, EPA's BOD/TOC calculators, GIS
4. Develop Solutions	Generate feasible actions.	• Brainstorm corrective measures (treatment, source control, monitoring plan). • Prioritize by cost, effectiveness, and time. • Draft work plans or SOP updates.	Decision matrix, cost? benefit sheets
5. Implement the Solution	Put the chosen action into practice.	• Conduct field installation or remediation. • Train personnel on new procedures. • Re-sample and compare to baseline.	Project management software, safety permits
6. Evaluate & Document	Verify success and close the loop.	• Prepare technical reports & regulatory submissions. • Record lessons learned for future projects.	Report templates, audit checklists, electronic lab notebooks

3. Common Problem Types & Example Approaches

Problem Category	Typical Trigger	Example Scenario	Solution Sketch

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Problem Solving

Contaminated Soil

Unexpected exceedance in a site assessment. Soil samples show benzene > 5mg/kg (state limit).

1?? Confirm with duplicate samples.

2?? Map hotspot with GIS.

3?? Recommend excavation & off-site disposal or in-situ bioremediation.

4?? Verify post-remediation levels.

1?? Check BMP functionality (e.g., retention basin).

2?? Adjust discharge timing or add filtration.

3?? Install additional vegetative buffer.

4?? Monitor weekly for 30 days.

Stormwater Runoff Violations

NPDES permit exceedance.

Phosphate concentration in runoff = 0.4mg/L (limit 0.2mg/L).

**Air Emissions Spike