CONCEPT

Contaminated Land Remediation and Brownfield Redevelopment: Investigation, Risk and Cleanup

15 – 19 August 2027
Dammam - Eastern Province five-star



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Ref: 450_14190 **Date:** 15 – 19 August 2027 **Location:** Dammam - Eastern Province five-star **Fees:** 19500 SAR

Introduction:

Contaminated land remediation fails when owners dig out soil before they understand the plume, choose a technology that cannot reach the contaminant, or close a site without proof that cleanup targets were met. Former fuel depots, refineries, workshops and chemical yards then stall redevelopment and carry open-ended liability. This Core Concept course trains practitioners to investigate hydrocarbon, metal and chlorinated solvent contamination in soil and groundwater, build a conceptual site model, set risk-based cleanup targets, appraise remediation options and verify results. Participants produce a Site Remediation Strategy and Verification Plan.

Course Objectives:

- Identify likely contaminant sources, types and release histories at a site through a Phase I desk study and site walkover
- Design a Phase II intrusive investigation with sampling locations, depths, analytical suites and laboratory quality checks that answer defined data needs
- Build and update a conceptual site model linking sources, migration pathways and receptors for soil, soil vapour and groundwater
- Derive risk-based remediation targets from exposure scenarios and screening levels for the intended end use of the land
- Appraise and select remediation technologies such as excavation, soil vapour extraction, bioremediation, pump-and-treat, in-situ chemical oxidation and stabilisation against site constraints, cost and timescale
- Plan verification sampling, closure evidence and long-term groundwater monitoring for a brownfield redevelopment in a Site Remediation Strategy and Verification Plan

Target Audience:

- Environmental engineering staff who scope and supervise site investigations and remediation works
- Consultancy staff who prepare desk studies, investigation reports and remediation options appraisals
- Development and property staff responsible for acquiring and preparing previously used industrial land for reuse
- Oil, gas and industrial HSE staff who manage legacy spills, leaking tanks and pipeline releases on operating or decommissioned sites
- Remediation contractor supervisors who operate treatment systems and collect verification samples

Course Outline:

Day 1: Contamination Sources, Contaminant Behaviour and the Phase I Desk Study

- Brownfield Land Definition, Former Land Uses and Redevelopment Drivers
- Petroleum Hydrocarbons, BTEX, PAHs and MTBE: Release Modes and Behaviour in the Subsurface
- Heavy Metals and Chlorinated Solvents: Mobility, Persistence and Dense Non-Aqueous Phase Liquids
- Phase I Desk Study Sources: Historical Maps, Site Records and Tank Registers
- Site Walkover Checklist and Preliminary Source-Pathway-Receptor Screening

Day 2: Phase II Intrusive Investigation and the Conceptual Site Model

- Phase II Investigation Layout: Targeted and Grid Sampling Strategies
- Trial Pits, Window Sampling Boreholes and Groundwater Monitoring Well Installation
- Soil Vapour Probes, Headspace Screening and Free-Product Thickness Gauging
- Laboratory Analytical Suites, Detection Limits and Data Quality Review
- Conceptual Site Model Diagram: Plume Delineation, Pathways and Receptors

Day 3: Risk-Based Assessment and Cleanup Target Setting

- Exposure Scenarios for Residential, Commercial and Industrial End Uses
- Human Health Exposure Pathways: Direct Contact, Vapour Intrusion and Groundwater Ingestion
- Generic Screening Levels Versus Site-Specific Remediation Goals
- Incremental Lifetime Risk and Hazard Quotient Calculation Worksheet
- Ecological Receptors and Groundwater Resource Protection Targets

Day 4: Remediation Technologies, Treatability and Options Appraisal

- Excavation and Off-Site Disposal Versus On-Site Biopiles and Thermal Desorption
- Soil Vapour Extraction and Air Sparging: Well Spacing, Airflow and Radius of Influence
- Enhanced Bioremediation and Monitored Natural Attenuation Lines of Evidence
- Pump-and-Treat with Air Stripping and Activated Carbon, and In-Situ Chemical Oxidation with Permanganate, Persulfate and Fenton's Reagent
- Solidification and Stabilisation of Metals, and a Weighted Remediation Options Appraisal Matrix

Day 5: Former Fuel Depot Case Work and the Remediation Strategy

- Former Fuel Depot Case: Interpreting Phase II Data and Refining the Model
- Chemical Yard Case: Solvent Plume Treatment Selection and Treatability Test Review
- Verification Sampling Plan and Closure Report Evidence Requirements
- Long-Term Groundwater Monitoring Network and Contingency Triggers for Redevelopment
- Site Remediation Strategy and Verification Plan Drafting and Peer Review

Skills You Will Gain:

- Desk Study Preparation
- Intrusive Investigation Planning
- Conceptual Site Modelling
- Human Health Risk Calculation
- Remediation Technology Screening
- Treatability Data Interpretation
- Verification Sampling Design
- Brownfield Redevelopment Planning

Why Attend This Course:

- Return with a Site Remediation Strategy and Verification Plan built from realistic fuel depot and chemical yard investigation data
- Avoid paying for excavation or treatment that misses the contaminant mass by basing every decision on a tested conceptual site model
- Explain to investors, planners and site owners why a cleanup target and technology were chosen and what evidence will close the site
- Compare investigation and cleanup practice with engineers, consultants and developers from energy, manufacturing and property sectors

Conclusion:

Contaminated land becomes usable again only when investigation, risk assessment and treatment are linked by one evidence trail. The one week move from contaminant sources and the Phase I desk study, through intrusive investigation and the conceptual site model, to risk-based cleanup targets and the appraisal of excavation, vapour extraction, biological, hydraulic, chemical and stabilisation treatments. The final day applies these methods to fuel depot and chemical yard cases and produces a Site Remediation Strategy and Verification Plan ready for a real redevelopment site.