

**MASTER CONTENT OUTLINE  
FOR  
LICENSED SITE PROFESSIONAL EXAMINATION**

**1. SITE ASSESSMENT (31%, 50 Items)**

**A. GATHER AND INTERPRET APPROPRIATE HISTORICAL AND VISUAL SITE INFORMATION**

1. Ability to identify sources of information
  - a. Insurance maps and site plans
  - b. Deeds
  - c. Photographs
  - d. Historical business/site records
  - e. MassDEP files and databases
  - f. Regulatory (town and state) permits
  - g. USGS/GIS/geologic maps
  - h. Infrastructure records
  - i. Existing site reports
  - j. Zoning, master plans, and aquifer protection maps
2. Ability to conduct interviews
3. Ability to interpret historical site information
4. Ability to interpret observations at site

**B. DETERMINE AFFECTED MEDIA**

1. Knowledge of geology
  - a. Soil types
  - b. Depth of bedrock
  - c. Types of bedrock
  - d. Integrity of bedrock
2. Knowledge of hydrogeology
  - a. Types of aquifers
  - b. Presence of aquitards
  - c. Depth of groundwater
  - d. Direction of groundwater flow
  - e. Rates of groundwater flow
  - f. Groundwater discharge points
  - g. Groundwater recharge points
  - h. Presence of preferred pathways
  - i. Groundwater withdrawal points
3. Knowledge of surface hydrology
  - a. Precipitation characteristics
  - b. Topographical characteristics
  - c. Runoff and erosion
  - d. Sediment transport and deposition
  - e. Flow rate and dilution
  - f. Infiltration rate
4. Knowledge of chemistry and biochemistry

- a. Physical properties of oil and hazardous materials
  - (1) Density
  - (2) Specific Gravity
  - (3) Solubility
  - (4) Viscosity
  - (5) Volatility
  - (6) Henry's Law
- b. Chemical properties of oil and hazardous materials
  - (1) Reactivity
  - (2) Flammability
  - (3) Corrosivity
  - (4) Partition coefficients
  - (5) Degradation
  - (6) Speciation
  - (7) Oxidation reduction
- 5. Knowledge of underground storage tanks
  - a. Common construction materials
  - b. Corrosion processes
  - c. Leak detection methods
  - d. Age/integrity relationships
  - e. Operation and maintenance
  - f. Common failure or release modes
- 6. Knowledge of common industrial practices
  - a. Gas stations and petroleum storage industry
  - b. Dry cleaners
  - c. Electroplaters
  - d. Machining
  - e. Solvent cleaning
- 7. Knowledge of disposal practices
  - a. Dumps
  - b. Landfills
  - c. Cesspools
  - e. Septic fields
  - f. Injection wells
  - g. Floor drains
  - h. Sewers and storm drains
  - i. Stack emissions
  - j. Road spray
  - k. Waste tanks
  - l. Non-point sources
- 8. Knowledge of fate and transport processes
  - a. Air
  - b. Surface water
  - c. Groundwater
  - d. Soil
  - e. Sediment

- f. Bioconcentration
  - g. Soil gas
  - h. Non-aqueous phase liquids
9. Knowledge of biota
- a. Stressed vegetation
  - b. Food-chain transfers

**C. DETERMINE SAMPLING AND SITE EXPLORATION PLAN**

1. Ability to develop and utilize conceptual site models
  - a. Source identification
  - b. Nature, degree and extent
  - c. Risk characterization
  - d. Remedial design
  - e. Data quality objectives
2. Ability to develop appropriate spatial and temporal monitoring plans
  - a. Number of sampling locations
  - b. Sampling frequency
  - c. Sampling analytes
3. Knowledge of drilling techniques
  - a. Hollow stemmed auger
  - b. Drive and wash
  - c. Air rotary
  - d. Rotosonic
  - e. Mud rotary
  - f. Microwells
  - g. Direct push technology
4. Knowledge of well construction
  - a. Construction materials
  - b. Screened interval
  - c. Well diameter
  - d. Well packing and sealing
  - e. Well development
  - f. Well abandonment
  - g. Well security
  - h. Depth
5. Knowledge of sampling techniques and procedures
  - a. Bailers
  - b. Pumps
  - c. Split spoon samplers
  - d. Hand augers
  - e. In-situ techniques
  - f. Cores
  - g. Soil gas probes
  - h. Air/soil gas canisters/containers
  - i. Sorption tubes
  - j. Biota
  - k. Composite vs. discrete samples

- l. Random vs. judgmental sample
  - m. Decontamination procedures
  - n. Sample disposal
  - o. Low-flow sampling
  - p. Diffusion sampling techniques
  - q. Water level measurements
  - r. NAPL measurements
  - s. Incremental Sampling Methodology (ISM)
  - t. Pressure differential determination
- 6. Knowledge of sample handling procedures
    - a. Sample containers
    - b. Sample preservation
    - c. Sample storage
    - d. Chain of custody procedures
    - e. Holding time
    - f. Sample quantity required
    - g. Transportation
    - h. Filtering
  - 7. Ability to recognize signs of contamination

**D. DETERMINE ANALYTES AND METHODS**

- 1. Knowledge of chemical composition of common OHM mixtures
  - a. Petroleum products
  - b. Waste oil
  - c. Manufactured gas plant waste
  - d. Plating waste
  - e. Landfill leachate
- 2. Knowledge of testing methods
  - a. Gas chromatography
  - b. Gas chromatography/mass spectroscopy
  - c. Infrared spectroscopy
  - d. Petroleum analytical methods including VPH/EPH and residual saturation
  - e. Applicability of different testing methods
  - f. Limitations of different testing methods
- 3. Knowledge of screening techniques
  - a. Headspace
  - b. Immunoassay
  - c. Colorimetric
  - d. pH/conductivity/temperature
  - e. X-ray fluorescence
  - f. Ultraviolet Fluorescence (UVF)
  - g. Laser-Induced Fluorescence (LIF)
- 4. Knowledge of QA/QC practices
  - a. Precision
  - b. Accuracy
  - c. Lab/trip blanks
  - d. Matrix spikes

- e. Reporting limits
- 5. Knowledge of data usability principles, procedures, and requirements
  - a. data quality objectives
  - b. Presumptive Certainty
  - c. appropriate use/limitations of testing methods and method modifications
  - d. utility and implications of QA/QC requirements and performance standards

**E. EVALUATE/INTERPRET DATA**

- 1. Ability to evaluate data representativeness
- 2. Ability to integrate data in a meaningful manner
- 3. Ability to determine adequacy of assessment
- 4. Ability to determine nature and extent of contamination
- 5. Ability to determine nature and extent of migration pathways
- 6. Ability to determine need for further assessment
- 7. Ability to determine background and local conditions
- 8. Ability to identify Substantial Release Migration
- 9. Ability to identify Critical Exposure Pathways

**F. PERFORM RISK ASSESSMENT**

- 1. Ability to identify/screen transport pathways, exposure points
  - a. Air
  - b. Water
  - c. Soils
  - d. Sediments
- 2. Ability to identify/screen exposure pathways
  - a. Ingestion
  - b. Inhalation
  - c. Dermal
- 3. Ability to identify/screen receptors
  - a. Human
    - (1) Children
    - (2) Adults
    - (3) Groups of sensitive receptors (e.g., pregnant, elderly)
  - b. Aquatic biota
  - c. Terrestrial biota
- 4. Determination of exposure point concentrations
  - a. Evaluation of hot spots
  - b. Evaluation of non-detects
  - c. Arithmetic averages
- 5. Knowledge of toxicology
  - a. Substances of concern
    - (1) Carcinogens
    - (2) Non-carcinogens
    - (3) Mutagens
    - (4) Teratogens
  - b. Effects

- (1) Acute
- (2) Subchronic
- (3) Chronic
- 6. Knowledge of ecological risk assessment techniques
  - a. Determination of complete and incomplete pathways
  - b. Stage I screening
  - c. Stage II comprehensive
- 7. Ability to identify current and foreseeable site uses
  - a. Zoning
  - b. Wetlands
  - c. Land use
  - d. Plans
  - e. Ownership
- 8. Ability to communicate risk to the public effectively
- 9. Knowledge of human risk assessment methods and models
  - a. Deterministic models
  - b. Probabilistic models
  - c. MassDEP short form risk assessment
- 10. Ability to determine need for and extent of risk reduction
  - a. Pathway elimination
  - b. Receptor relocation
  - c. Contaminant reduction
  - d. Estimation of cleanup targets
- 11. Ability to identify Imminent and Substantial Hazards
- 12. Ability to evaluate risks to public welfare

**2. REMEDIATION (16%, 25 ITEMS)**

**A. IDENTIFY OBJECTIVES**

- 1. Ability to interpret site and risk characterization

**B. IDENTIFY AND EVALUATE ALTERNATIVES WHICH MEET OBJECTIVES**

- 1. Knowledge of remediation techniques
  - a. Excavation and removal
  - b. Thermal desorption
  - c. Chemical fixation
  - d. Asphalt emulsion fixation
  - e. Incineration
  - f. Biological degradation
  - g. Soil vapor extraction
  - h. Sparging
  - i. Air stripping
  - j. Carbon adsorption
  - k. Capping/containment
  - l. Chemical oxidation
  - m. Reactive walls
  - n. Groundwater extraction/hydraulic containment

- o. Multi-phase extraction
- p. Monitored natural attenuation
- 2. Knowledge of remedial design considerations
  - a. Technical limitations
  - b. Regulatory limitations
  - c. Economic/financial limitations
  - d. Risk from remedial operations
- 3. Knowledge of permit requirements
- 4. Ability to perform cost effectiveness analysis
  - a. Capital costs
  - b. Operation and maintenance costs
  - c. Benefits analysis

**C. SELECT PREFERRED ALTERNATIVE**

- 1. Ability to select appropriate alternative
- 2. Ability to justify selection

**D. CONSTRUCT PREFERRED ALTERNATIVE**

- 1. Knowledge of health and safety standards
- 2. Knowledge of basic construction techniques/constraints

**E. OPERATE AND MAINTAIN PREFERRED ALTERNATIVE**

- 1. Ability to specify appropriate monitoring parameters and frequencies
  - a. Discharge effluent(s)
  - b. Site media
  - c. Mechanical systems

**F. MONITOR AND DOCUMENT EFFICACY**

- 1. Ability to evaluate effectiveness of remediation
  - a. Ability to interpret monitoring data
  - b. Comparison of actual performance to design performance
- 2. Knowledge of documentation requirements

**G. TERMINATE REMEDIATION**

- 1. Ability to interpret site data to document compliance with remediation objectives and cleanup requirements

**3. NOTIFICATION REQUIREMENTS AND PROCEDURES (7%, 11 ITEMS)**

**A. DETERMINE REPORTING REQUIREMENTS FOR RELEASE**

- 1. Ability to use and interpret MOHML
- 2. Knowledge of the reporting exemptions of the MCP
- 3. Knowledge of Adequately Regulated provisions
- 4. Ability to verify data
- 5. Knowledge of regulated media (e.g., groundwater vs. surface water)

**B. DETERMINE WHETHER REPORTING THRESHOLD IS MET**

- 1. Knowledge or reporting thresholds
  - a. Quantities
  - b. Concentration
  - c. Site conditions
- 2. Knowledge of notification timing
- 3. Knowledge of site characteristics (RCGW-1, etc.)

- a. Current use
- b. Proximity to groundwater and surface water resource areas
- c. Proximity to sensitive receptors

**C. INFORM CLIENT OF APPROPRIATE NOTIFICATION PROCEDURES**

1. Knowledge of whether client has duty to report
  - a. Determine whether client is potentially responsible party (e.g., owner or operator)
  - b. Determine whether client is otherwise required to report (e.g., fiduciaries, utilities)
2. Knowledge of notification requirements, procedures and forms
  - a. Type of notification (e.g., verbal, written)
  - b. Which regional office to notify
  - c. Off-hours notification procedures
  - d. Which form(s) to use and eDEP filing procedures
  - e. eDEP alternative filing procedure
  - f. Timing for submittal of completed forms

**D. DETERMINE LSP's NOTIFICATION REQUIREMENTS**

1. Knowledge of imminent hazard requirements of LSP regulations
  - a. Timing of notification to DEP
2. Knowledge of notification requirements for termination of LSP
  - a. Definition of LSP of Record
  - b. Timing of notification

**4. RESPONSE ACTION REQUIREMENTS (15%, 24 ITEMS)**

**A. DETERMINE NEED FOR RISK REDUCTION MEASURES**

1. Knowledge of LRA provisions
2. Knowledge of URAM provisions
3. Knowledge of RAM provisions
4. Knowledge of IRA provisions
5. Knowledge of Critical Exposure Pathway provisions

**B. PERFORM APPROPRIATE RISK REDUCTION MEASURES**

1. Knowledge of response action requirements and limits
  - a. Quantities of remediation waste
  - b. Objectives and restrictions of specific risk reduction measures
  - c. Financial assurance
2. Knowledge of plans, status reports, completion reports and forms
  - a. Requirement for
  - b. Timing
  - c. Type of approvals
  - d. Submittal requirements



**C. UNDERTAKE PRELIMINARY RESPONSE ACTIONS**

1. Knowledge of required investigations and reports
  - a. Determine whether a Phase I report is necessary
  - b. Content of Phase I report
2. Knowledge of time frame
3. Knowledge of resulting options
  - a. Permanent Solution
  - b. Requirement for Tier Classification
4. Knowledge of Downgradient Property Status
  - a. Generation and evaluation of empirical lines of evidence
    - (1) hydrogeological
    - (2) contaminant releases and media concentrations
    - (3) analytical test data/forensics
  - b. Discussion and articulation of weight-of-evidence opinion

**D. TIER CLASSIFY**

1. Knowledge of Tier Classification Process
  - a. Massachusetts Geographic Information Systems (GIS) maps
  - b. Tier I criteria
  - c. Public and Written Notice requirements
  - d. Eligible Persons and Tenants

**E. FOLLOW APPROPRIATE TIER REGULATIONS**

1. Knowledge of Tier ID requirements
2. Knowledge of Tier reclassification requirements and process
3. Knowledge of Tier extension process

**F. CONFORM TO COMPREHENSIVE RESPONSE ACTION REQUIREMENTS**

1. Knowledge of required investigation and reports
  - a. Phase II: Comprehensive Site Assessment
    - (1) Determine whether a Phase II report is necessary
    - (2) Content of Phase II report
    - (3) Knowledge of time frame
    - (4) Knowledge of resulting options
      - (a) Permanent Solution
      - (b) Requirement for Phase III
  - b. Phase III: Comprehensive Feasibility Study
    - (1) Determine whether a Phase III report is necessary
    - (2) Content of Phase III report
    - (3) Knowledge of time frame
    - (4) Knowledge of resulting options
      - (a) Permanent or Temporary Solution
      - (b) Requirement for Phase IV
  - c. Phase IV: Comprehensive Remedial Actions
    - (1) Determine whether a Phase IV report is necessary
    - (2) Content of Phase IV report
    - (3) Knowledge of time frame

- (4) Knowledge of resulting options
  - (a) Permanent or Temporary Solution
  - (b) Requirement for Phase V
- d. Phase V: Operation and Monitoring
  - (1) Content of Phase V report
  - (2) Knowledge of time frame
  - (3) Knowledge of resulting options
    - (a) Permanent or Temporary Solution
    - (b) Phase V Operation and Maintenance
    - (c) Re-evaluate need for additional response actions
    - (d) Remedy Operation Status applicability and requirements
- 2. Knowledge of conditions that require reclassification

**5. RESPONSE ACTION STANDARDS (15%, 24 ITEMS)**

**A. USE APPROPRIATE METHOD TO DETERMINE AND/OR ACHIEVE NO SIGNIFICANT RISK”**

- 1. Knowledge of applications and limitations of Methods 1, 2 and 3
- 2. Ability to apply Method 1 standards
  - a. Knowledge of soil classification categories
  - b. Knowledge of groundwater classification categories
- 3. Ability to develop and then apply Method 2 standards
  - a. Knowledge of fate and transport processes and mathematical model
  - b. Knowledge of Method 2 ceiling concentrations
- 4. Ability to conduct or interpret Method 3 risk characterization
  - a. Knowledge of DEP guidance documents
  - b. Knowledge of MCP risk management standards
- 5. Knowledge of Upper Concentration Limits and their applicability
- 6. Knowledge of performance standards to achieve Temporary or Permanent Solution

**B. COMPLY WITH RESPONSE ACTION PERFORMANCE STANDARD (RAPS)**

- 1. Ability to demonstrate appropriate standard of care

**C. DETERMINE WHETHER PERMANENT OR TEMPORARY SOLUTION IS ACHIEVED**

- 1. Knowledge of performance standards to achieve temporary or permanent solution Source Elimination or Control
  - a. Migration Control
  - b. NAPL
  - c. Background Levels of OHM
  - d. Active Exposure Pathway Mitigation Measures
- 2. Knowledge of Categories of Permanent Solution
- 3. Knowledge of Activity and Use Limitations (AULs)
  - a. When AULs are required
  - b. When AULs are allowed

- c. Type, content and formats of AULs
- d. How to modify or remove AULs
- e. Filing and notification requirements
- 4. Knowledge of temporary solution requirements
  - a. Periodic evaluation of site conditions, technologies and exposures
  - b. Feasibility of achieving permanent solution
- 5. Knowledge of requirements to determine feasibility of restoration to or approaching background
- 6. Knowledge of regulatory provisions for remedial actions conducted after a Permanent or Temporary Solution has been achieved
- D. COMPLY WITH REMEDIATION WASTE, REMEDIAL WASTE WATER, AND REMEDIAL AIR EMISSIONS MANAGEMENT STANDARDS**
  - 1. Knowledge of applicability
  - 2. Knowledge of classification criteria
  - 3. Knowledge of storage/disposal deadlines
  - 4. Knowledge of tracking/BOL criteria
  - 5. Knowledge of disposal/recycling alternatives, requirements and limitations
    - a. On-site
    - b. Off-site
    - c. Testing criteria
    - d. Record keeping and reporting
- E. COMPLY WITH HEALTH AND SAFETY REQUIREMENTS**
  - 1. Knowledge of worker health and safety issues and standards
    - a. Familiarity with federal laws and regulations
    - b. Familiarity with state laws and regulations
    - c. Personal protective equipment
  - 2. Knowledge of public health and safety issues and standards
    - a. Potential receptors
    - b. Pathways
    - c. Mitigation techniques
  - 3. Knowledge of monitoring techniques

**6. SUBMITTAL REQUIREMENTS (5%, 8 ITEMS)**

**A. UTILIZE APPLICABLE DEP FORMS**

- 1. Knowledge of when forms are required
- 2. Knowledge of which forms are required
- 3. Knowledge of electronic submittal procedures
- 4. Ability to complete forms properly

**B. COMPLY WITH REPORTING AND SUBMITTAL FORMATS**

- 1. Knowledge of content and format of required report submittals

**C. COMPLY WITH REPORTING AND SUBMITTAL SCHEDULES**

- 1. Knowledge of reporting requirements and schedules

**D FEES**

- 1. Knowledge of when fees are required

- 2. Knowledge of fees
- 7. PUBLIC INVOLVEMENT REQUIREMENTS (3%, 5 ITEMS)**
- A. NOTIFY APPROPRIATE PARTIES PER REGULATIONS**
    - 1. Ability to advise client of public involvement requirements
      - a. Identify appropriate parties
      - b. Knowledge of format and timing of required notification
  - B. COMPLY WITH PUBLIC INVOLVEMENT PLAN (PIP) PROVISIONS IF APPLICABLE**
    - 1. Ability to advise client of PIP requirements
      - a. Knowledge of when PIP applies
      - b. Knowledge of PIP process
- 8. STATUTES AND REGULATIONS (3%, 5 ITEMS)**
- A. COMPLY WITH MGL c. 21E and 21A, sections 19 through 19J**
    - 1. Knowledge of administrative sanctions
    - 2. Knowledge of civil sanctions
    - 3. Knowledge of criminal sanctions
  - B. COMPLY WITH APPROPRIATE FEDERAL REGULATIONS**
    - 1. Ability to advise client as to applicability of federal regulations that pertain to response actions
      - a. NPDES
      - b. RCRA
      - c. TSCA
      - d. CERCLA
  - C. COMPLY WITH APPROPRIATE STATE REGULATIONS**
    - 1. Ability to advise client as to applicability of state regulations that pertain to response actions
      - a. Wetlands
      - b. Groundwater discharge permits
      - c. Underground injection control
      - d. Underground storage tanks
      - e. Sewer extension/discharge permits
      - f. Air quality
- 9. LSP STANDARDS OF PROFESSIONAL CONDUCT (5%, 8 ITEMS)**
- A. ADDRESS CONFLICTS OF INTEREST**
    - 1. Ability to identify potential conflicts of interest
    - 2. Knowledge of how to resolve conflicts of interest
  - B. ADDRESS ISSUES OF PROFESSIONAL RESPONSIBILITY**
    - 1. Knowledge of situations requiring client notification
    - 2. Knowledge of limited confidentiality rules
    - 3. Knowledge of ethical standards for business or professional practices
  - C. ADDRESS ISSUES OF PROFESSIONAL COMPETENCE**
    - 1. Knowledge of criteria for rendering Opinions

**D. COMPLY WITH LSP BOARD'S RULES OF PROFESSIONAL CONDUCT**

1. Knowledge of LSP Board's rules of professional conduct
2. Knowledge of LSP Board's advisory rulings