



## School Sites with Naturally Occurring Asbestos Role of Department of Toxic Substances Control

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Sharon Fair, Branch Chief  
School Property Evaluation & Cleanup  
Division  
Department of Toxic Substances Control  
California Environmental Protection Agency  
(818)551-2821  
[sfair@dtsc.ca.gov](mailto:sfair@dtsc.ca.gov)  
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## Role of Department of Toxic Substances Control at Schools

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- Under Education Code, DTSC identifies environmental contaminants prior to school construction or expansion financed by state bonds
- DTSC oversees environmental assessments and response actions at prospective, expanding, and existing school sites
- DTSC evaluates environmental health risks, protects children and adults from exposure to hazardous materials

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## Role of DTSC at School Sites with Naturally Occurring Asbestos

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- DTSC requires identification and investigation of NOA:
  - A) serpentine (chrysotile mineral)
  - B) amphibole (actinolite, amosite, anthophyllite, crocidolite, tremolite minerals)
- Mitigation (barriers to prevent or reduce exposures)
- Monitoring for long-term protection
- Maintenance of engineering, administrative and institutional controls

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## Health Effects from Asbestos

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- Airborne asbestos fibers can lodge in lungs
- Lung cancers, e.g., mesotheliomas; synergistic impacts associated with cigarette smoking
- Asbestosis (respiratory disease)
- Short and long-term hazards; the longer the exposure, the greater the potential risk

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## Geologic Occurrence of Asbestos in California

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- Ultramafic rock formations (90% dark, iron-magnesium-silicate minerals)
- Serpentine, California's state rock
- Fault shear zones, alluvial deposits, in surfacing and fill materials
- Downstream sediments
- Almost all counties in California
  - See Geologic Survey Maps

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## DTSC Process for School Sites with NOA

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- **Step 1- Identification:**
  - Phase I Environmental Site Assessments
- **Step 2 -Investigation:**
  - Preliminary Environmental Assessments
- **Step 3 -Mitigation:**
  - Response Actions
- **Step 4 -Monitoring:**
  - Long-Term Protection

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## Step 1: Identification of NOA at School Sites

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- Phase I Environmental Site Assessment
- Map review
- Site inspection by qualified professional consultant
- If no evidence of NOA or other recognized environmental conditions, DTSC will issue “No Action” determination

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## Step 2: Investigation of NOA at School Sites

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- PEA Required if NOA identified in Phase I
- Environmental Oversight Agreement
- Qualified professional consultant
- Scoping Meeting
- PEA Workplan for testing and analysis
  - DTSC approval required

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## Step 2: Investigation of NOA at School Sites, Continued

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- **Soil samples from:**
  - Areas suspected of NOA
  - Soils or aggregate with NOA, even if no visible presence of NOA
  - Imported fill or surfacing materials
- **Sites with identifiable geologic formations**
  - Focused Sampling
- **Sites with homogeneous topography and lithology**
  - Trenching
  - Identification of each mineral type at soil lithology interface
- **Existing schools**
  - Evaluate exposed areas, consider activity pattern sampling
  - Collect surface and subsurface samples if future excavation is likely

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## Step 2: Investigation of NOA at School Sites, Continued

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- **Analysis by:**
  - Polarized Light Microscopy (PLM)
  - Transmission Electron Microscopy (TEM)
- **Data validation:**
  - Specify In PEA Workplan and PEA Report
  - Preparation methods and counting rules
- **Strategy:**
  - Analyze all samples by PLM (CARB 435 method) to screen site
  - Analyze some samples by TEM (USEPA Method 600/R-93/116) if PLM results are non-detect or trace

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## Step 2: Risk Management Approach for NOA at School Sites

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- PEA: No Health Risk Assessment for NOA
  - **Difficult to model, predict airborne fiber concentrations from asbestos fibers in soil**
- Further Action depends on frequency and location of soil samples with NOA concentrations exceeding thresholds:
  - PLM Criteria: NOA greater than 0.25 % (number of asbestos structures)
  - TEM Criteria: NOA greater than or equal to 0.001% (asbestos fibers by weight)

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## Step 3: Mitigation at School Sites with NOA

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- **Mitigation (response actions)**
  - Require DTSC approval
  - Performed under Health and Safety Code
- **Voluntary Cleanup Agreement**
- **Major elements of Removal Action Workplans:**
  - Cleanup objectives
  - Site background and investigation
  - Nature, source, and extent of NOA
  - Applicable or Relevant and Appropriate Requirements
  - Evaluation of remedial alternatives; selection of remedy
  - Public Participation
  - Implementation plans, control measures
  - Long-term administrative, institutional, and engineering controls

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## Step 3: Applicable Remedies for NOA at School Sites

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- Removal and offsite disposal
  - All surfacing or fill materials containing NOA
- Cap or Cover with:
  - Clean fill (properly tested)
  - Buildings
  - Hardscape
  - Sod or landscaping
- Marker between fill and native soils
- Operation & Maintenance Plan
- Land Use Restrictions

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## Step 3: Considerations for Remedy Selection for NOA at School Sites

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- School design and land uses
  - Hardscape Areas
  - Landscape Areas
  - Playfields
  - Utility Corridors
  - Embankments
- Cleanup criteria may vary depending on uses:
  - 0.001% TEM in high use areas where soil disturbance is likely
  - 0.01% TEM in areas where heavy activities are not anticipated, such as planter boxes or landscaped areas

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## Implementation Plan

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- Transportation
- Health and Safety
- Disposal
- Air Monitoring
- Dust Mitigation
- Storm Water Pollution Prevention
- Imported fill material testing

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## Air and Dust Monitoring during Mitigation/Construction

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- Air Monitoring
  - Ambient/Fenceline
  - TEM analysis
  - Comply with Air Toxic Control Measure
- Worker Protection
  - Personal monitors
  - PCM analysis
- Dust
  - Direct read or integrated dust meters
  - No visible dust

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## Step 3: Public Participation for School Sites with NOA

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- PEA: Education Code and CEQA requirements for public hearing and public comment period
- RAW: DTSC develops strategy under H&SC:
  - Community Profile and Survey
  - Fact Sheets (with translations)
  - Public Notice in local newspapers
  - Public Participation Plan
  - Public meetings
  - 30 day public comment period
  - Response to Comments; possible RAW revisions

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## After Mitigation: Leaving Hazardous Materials Behind

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- Administrative, Institutional, and Engineering Controls
  - Minimize potential exposure
  - Protect remedies when hazardous materials left in place
- Administrative Controls:
  - Periodic inspections and reports; Affirmative Statement of Owner; Deed Restriction Registry, Worker Training
- Institutional Controls:
  - Land Use Covenants, Zoning Restrictions, Building/Excavation Permits, Easements
- Engineering Controls:
  - Installation of cap or cover, protective cover; monitoring of fill

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## Operation and Maintenance Agreements, Plans

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- Required for Site Certification
- O&M Plan
  - Schedules periodic inspections & reports
  - Parameters for reviews of operation, monitoring, data collection, & maintenance
- O&M Agreement implements O&M Plan
  - Enforceable Agreement
  - If remedy fails, requires additional investigation and remediation
  - Requires O&M throughout life cycle of remedy, may extend 30 years or more

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## For Further DTSC Information

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- **See DTSC's Website [dtsc.ca.gov](http://dtsc.ca.gov) for:**
  - Fact Sheet #4: Further Action/Response Actions at School Sites
  - Interim Guidance – Naturally Occurring Asbestos at School Sites
  - Importing Clean Fill

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