Chromium 6 Workshop

Special Board Meeting (Glendale)
November 13, 2000

California Regional Water Quality Control Board
Los Angeles Region
Chromium

Chromium in the environment
– exists in three principal forms

• Chromium metal (0)
• Chromium Three (trivalent chrome)
  – common mineral
  – essential nutrient in very small quantities
• Chromium Six (hexavalent chromium)
  – toxic chemical
  – forms soluble non-reactive compounds (readily moves in groundwater)
  – may occur naturally in very small concentrations
Sources of Chromium 6 Contamination

- Metal plating
- Steel making
- Bricks in furnaces
- Dyes and pigments
- Chrome plating
- Leather tanning
- Wood preservation
Chromium Contamination

- Chromium 6 contamination:
  - is widespread in the San Fernando Valley, especially along the eastern section
  - is predominantly the result of industrial practices that occurred from the 1940s through the early 1980s
San Fernando Valley Basin

- Large unconfined aquifer composed of alluvial deposits.

- Groundwater flows from west and north to the SE.

- Major aquifer for Los Angeles, Burbank and Glendale.
Several significant active sites have been under Regional Board oversight for some time

- Lockheed Aeronautics
- ITT Industries
- Allied Signal
- Menasco (Division of Coltech Industries)
- Courtaulds Aerospace
- Drilube Company
As pointed out earlier, Chromium 6 contamination has also been found in the South Bay and in San Gabriel Valley, e.g.

- one recent site was discovered as a result of excavation of the Alameda transportation corridor
  - Barkens Corporation
    - 810,000 ppb in shallow groundwater
    - site currently being assessed for extent of contamination
South Bay Chromium Sites

- Barkens Corporation (Compton)
- Fairchild Industries (Manhattan Beach)
- Mondo Chrome (South Gate)
- US Chrome
- Boeing (McDonnel Douglas-Long Beach)
- Anadite Corporation (South Gate)
- Voi Shan, Inc. (Paramount)
San Gabriel Valley Sites

• SGV Watermaster has begun a regional chromium 6 groundwater quality assessment

• 18 suspected chromium 6 sites known

• Xerox site in Pomona almost cleaned up
Chromium Contamination (continued)

- Typically, chromium 6 contamination is initially found at very high levels in the soil and shallow groundwater
  - Regional Board directed/oversight cleanups are producing results
    - Anadite (Southgate)
      - shallow groundwater ranged from 43,000 ppb to 5,000 ppb
    - Lawry’s (Los Angeles)
      - shallow groundwater reduced from 34,000 ppb to 110 ppb
- Each site requires extensive staff involvement to review technical reports
Chromium Contamination (continued)

- Chromium 6 contamination in deeper drinking water aquifers results from long-term contaminant spreading
  - through pathways such as improperly abandoned wells
  - contaminant migration to lower aquifers over time

- While drinking water aquifers show relatively small amounts of contamination,
  - it is imperative that existing sources of contamination be identified and the contamination remediated as quickly as possible to protect the resource
Remediation Approach

• After contamination is delineated in the soil, excavation and chemical fixation techniques are used to remove or immobilize residual contamination.

• These steps are followed by verification sampling and leachability tests to assure diminished threat to groundwater.
• Regional Board staff designs site-specific cleanup goals based on threat or depth to groundwater & proximity to water supply well(s). Cleanup to total chromium MCL is recommended.

• Groundwater is best treated using ion exchange at a cost of $0.30 to $0.80 per 1,000 gallons.
Local Groundwater Supply

- Groundwater pumped locally is
  - treated and blended with imported water from MWD or other wells before being distributed to customers
  - in effect, this reduces the concentration of chromium being delivered

- All distributed water meets Federal and State drinking water standards or is removed from supply
USEPA/Regional Board
San Fernando Valley
Chromium 6 Investigation

Goal
- Identify all sites that have used chromium - develop a multi-agency database.
  - Over 200 RB chromium sites identified.
  - 6 active sites impacted with chromium 6.
- Inspections will identify all chromium 6 sites in phases.
  - Inspections will start beginning of November 2000.
- Require soil assessment and groundwater assessment, if necessary.
SFV Cooperative Agreement
Under the 1999 Work Plan

- Identify sites that have used chromium - develop database
  ✓ 6 active sites contaminated with chromium
- Develop chemical use database (for all chemicals)
- Write case summaries for identified chromium 6 sites
- Develop geographical information system (GIS) maps
- Develop quality assurance project plan (QAPP)
- Develop a database system to input chromium data
- Continue work on active solvent and chromium sites
SFV Cooperative Agreement
Under the 2000 Work Plan

- Complete identification of potential chromium sites
  ✓ Over 200 potential chromium sites identified
- Conduct site inspections on identified sites
  ✓ Inspections will start beginning of November 2000
- Require soil and groundwater assessment, if needed
- Require soil and groundwater cleanup, if needed
- Complete Quality Assurance Project Plan (completed)
- Provide public outreach/workshops for dischargers and community
California Toxics Rule (CTR)

California Toxics Rule (CTR) imposes Numerical Limits for continuous surface water discharge:

- Freshwater (e.g. LA River) is 11 ppb
- Saltwater (e.g. Ocean) is 50 ppb

Limits driven by aquatic toxicity which can differ from human drinking water MCL levels
SUMMARY

- Regional Board authority is to ensure that contamination is prevented and/or identified and remediated
  - Maintain consistent enforcement policy
    - Issue CAOs for soil/groundwater assessments and cleanup
      - reduce threat/impact to water supply wells
      - reduce long-term cost of groundwater cleanup
  - Without regional groundwater cleanup
    - difficult to protect uncontaminated water supply wells.