

**Environmental Pollution at the
UCD - DOE LEHR National Superfund Site
&Its Implications for Adverse Impacts on
Public Health, Environment, and Groundwater Resources:
A Status Report**

G. Fred Lee, PhD, DEE and Anne Jones-Lee, PhD
Technical Advisors to the DSCSOC
G. Fred Lee & Associates
El Macero, CA

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Overview of Current Information on Pollution of Soils, Groundwater, and Putah Creek by
UCD/DOE LEHR Site Waste Disposal Practices

On-Site LEHR vs Off-Site Pollution and Impacts

What Is Known and What Needs to Be Known?

Possible Remediation Approaches

Deficiencies in Typical Superfund Approaches for Protection of Interests of Impacted
Public

**Summary of Pollution by
Waste-Disposal Activities at LEHR**

UCD Had Used LEHR Area for Campus Waste Disposal Prior to LEHR Research

- Campus Sewage Treatment Plant
- Campus Landfill

Research on Impact of Radioisotopes (Radioactivity) Led to Disposal of Radioactive
Chemicals, Hazardous Chemicals, and Otherwise Deleterious Chemicals as Wastes at
LEHR

LEHR Research Was Active for about 30 Years

Waste Disposed in Pits, Trenches, Landfills, Septic Tank, Cesspools, Dry Wells, Sewage
Treatment Plant, etc.

Pollution of Soils, Groundwater, and Surface Waters(?) with Tritium, Radium-226, Strontium-90, Carbon-14, Plutonium-241, Americium-221, Other Radioactivity, VOC's- Chloroform, Nitrate, Chlorinated Pesticides-Chlordane, Chromium, Salts, and Other Potentially Hazardous and/or Deleterious Chemicals

Some On-Site Individuals May Have Been Exposed to Excessive Radioactivity through External Exposure

**Did UCD and DOE Dispose of Wastes
at the LEHR Site in Accord with
Existing Regulations?**

Well-Known Since Late 1950's that UCD's and DOE's Waste Disposal Practices at LEHR Would Likely Lead to Groundwater Pollution

Good Waste Disposal Practices Ignored

Tried to Conduct Research at Less-Than-Real Cost -- Balance of Costs Must Now Be Paid

Regulatory Agencies Did Not Take Action That Should Have Been Taken to Protect Public Health, Environment, and Groundwater Resources

Public Has Not Required That Groundwaters Be Protected from Pollution by Landfills and Agriculture

Still a Problem Today

Status of Groundwater-Pollution Investigations

Pollution of Groundwater Known Since Mid-1980's

Pollution Well-Established in Late 1980's

Groundwater Pollution From LEHR Site Was under Adjacent Properties

UCD, DOE & Regulatory Agencies Did Not Take Action Then to Stop the Pollution

Groundwater Moving at 2 to 3 ft/day

UCD and DOE Still Have Not Developed Adequate Groundwater Monitoring Program to Define On-Site and Especially Off-Site Pollution

Errors Made by DOE in Water Quality Standards for Some Chemicals - Chloroform

Underestimated the Hazard of This Chemical

UCD/DOE Still Not Adequately Protecting Public Health from LEHR Site-Derived Wastes That Have Polluted Groundwaters under Site and Off-Site

DSCSOC Working to Get UCD and DOE to Place Higher Priority on Defining the Extent of Off-Site Groundwater Pollution

More Important to the Public Than On-Site Waste Removal

Second Aquifer under LEHR Site Used by City of Davis, El Macero, and Other Communities for Domestic Water Supply Not Yet Investigated for LEHR Pollution

Limited Funds Available Should First Be Used to Define the Magnitude of Off-Site Groundwater Pollution to Be Sure That No Off-Site Private or Public Production Wells Are Now Being Polluted by LEHR Site Wastes and Will Not Soon Be Polluted by Such Wastes



Unknowns

Aerial Extent & Degree of Off-Site Groundwater Pollution by LEHR Site Wastes

Past Pollution & Current Pollution of Putah Creek by LEHR Site Wastes

Pollution by LEHR Wastes of Second Aquifer under LEHR Site Used as Source of Water for Large Municipal and Private Water Supplies

Disposal Location of Imhoff Tank Sludge

Radioactive - Transported to Some Undefined Location

Location of the Disposal of Radioactive Wastes When UCD Landfill 3 Closed and the West Campus Landfill Opened

Should UCD West Landfill Be Made Part of LEHR Superfund Site?

Have Radioactive Wastes and Hazardous Chemicals Been Translocated (Taken Up) by Plant Roots at LEHR Site and Have Wildlife Been Exposed to Hazardous Conditions through Vegetation?

Needs to Be Investigated

Are There Other Hazardous Chemicals That Have Not Been Discovered at LEHR?

60,000 Chemicals In Use - Only about 200 Regulated

Pollution of Putah Creek by LEHR Site Activities

LEHR Waste Discharges to Putah Creek

Overflow from LEHR Site Waste Treatment Systems along Old Davis Road

Stormwater Discharge to Putah Creek

Indirect Discharges of LEHR Wastes to Current UCD Wastewater Treatment Which Discharges to Putah Creek

Drainage Ditch Cut through UCD Landfill 3 Which Has Exposed Hazardous Waste to Water in Ditch That Drains to Putah Creek

DOE Studies on Putah Creek Pollution Not Reliably Done

Incorrect Approach

Inappropriate Data Interpretation

Pollution Needs to Be Properly Investigated

DSCSOC Working to Improve Quality of Investigation on LEHR Site Impact on Putah Creek Water Quality

Note: Independent of LEHR Site Discharges, UCD Is Polluting Putah Creek by Its Wastewater Discharges and Stormwater Runoff

LEHR Is Likely Contributing to This Pollution

CVRWQCB Does Not Now Require Adequate Investigation and Treatment of Polluted Groundwater before Discharge to Putah Creek

Incorrect Chromium Standards

Inadequate Monitoring for Water Quality Impacts

Remediation Approaches Wastes and Contaminated Soils

Remove All Residual Wastes and Contaminated Soils for Off-Site Management

Best for Future Use of Site - Most Expensive

May Not Be Funds Available for Removal of Wastes

Construct On-Site RCRA Landfill and Move Residual Wastes and Contaminated Soils to New Landfill

RCRA Landfills Only Postpone Further Groundwater Pollution by Residual Wastes

Environmental Activists Misled Congress on How to Design a Landfill

California Water Resources Control Board Landfilling Regulations Are More Protective than Federal/US EPA Standards

Prevent Pollution/Use-Impairment for as Long as Wastes Are Threat

Will the CA Landfilling Standards Be Used at the LEHR Site?

How Will the Potentially Impacted Public Ensure That the Necessary Funds Will Be Available Forever to Properly Maintain and Monitor the Landfill?

Will UCD and DOE Develop a Dedicated Trust Fund of Sufficient Magnitude to Maintain and Monitor the Landfill to Be Sure That the Landfill Does Not Lead to Further Groundwater Pollution?

Cover Existing Waste Disposal Areas and Contaminated Soils With Low-Permeability Cover

Reduce Moisture Entering the Wastes and Stop Transport of Waste Components from Area

Typical Covers Not Reliable

Should Use Leak-Detectable Cover - New Technology

Must Have Funds Available Forever to Operate and Maintain Cover

Remediation of Polluted Groundwater at LEHR Site

Extensive Pollution of On-Site Groundwater by LEHR Wastes

Full Extent of This Pollution Not Now Known

Off-Site Pollution Not Reliably Investigated or Defined

Incorrect Chloroform Standard Used by DOE

Problem Not Detected by RPM's

Common Problem with Regulatory Agencies

Groundwater Monitoring Program for Nearby Neighbors' Wells Not Reliably Done by UCD

Did Not Measure One of the Most Hazardous Chemicals - Chloroform

Problem Corrected as Result of Its Being Pointed Out by DSCSOC

Inadequate Investigation of Off-Site Groundwater Pollution by DOE/UCD

Remediation of Groundwater Pollution near Waste Sources Could Be Initiated Now

Reduce Further Off-Site Transport of Wastes

Eventually, When Remediation of On-Site and Off-Site Groundwater Pollution Initiated, Will Require Many Years of Groundwater Pump and Treat

Must Avoid Situation That Developed with UCD West Landfill, i.e., Inadequate Investigation of the Potential of the Chemicals in the LEHR Site-Derived Waste-Polluted Groundwaters to Pollute Putah Creek

Groundwater Investigation and Remediation Issues

Will UCD and DOE Reassign Funding Priorities to Give Higher Priority to Off-Site Public Health and Groundwater Resource Protection Than On-Site Waste Characterization and Removal?

Will California Water Resources Control Board Groundwater Protection Standard Be Used to Establish Groundwater Remediation Goals of Protection from All Use-Impairment or Will the Federal US EPA Standard of Cleanup Only of Regulated "Hazardous" Chemicals Be Used?

Will All Chemicals That Impair Use of Groundwaters Be Remediated?

Total Salts

Taste and Odors

Until Reliable Information Available on Position of the Off-Site Groundwater Pollution Plume, UCD/DOE Should Conduct Comprehensive Monitoring of Off-Site Production Wells to Detect LEHR-Site Waste Components in Groundwater

Early Warning - Important for Public Health Protection

Groundwater near LEHR Naturally Polluted by Chromium and Selenium and by Ag Fertilizers - Nitrate

UCD's and DOE's Inappropriate Waste Management Practices at LEHR Should Not Cause the Public to Experience Further Impairment of the Use of the Groundwaters under Their Property

LEHR Site Investigation and Remediation Should Provide This Level of Protection

Bottom-Line Issues

- Has UCD, through Its Campus Waste Disposal Activities and Inappropriate UCD/DOE LEHR Waste Disposal Practices, Caused Extensive Pollution of LEHR Site and Possibly of Off-Site Groundwater? **Yes**
- Is There Evidence That This Pollution Has Caused Significant Public Health Harm? **No**
- Could Past and Current Wastewater Discharges of UCD to Putah Creek Have Caused, and currently Be Causing, Impairment of the Beneficial Uses - Water Quality - of Putah Creek? **Yes**
- Is There Need to Aggressively Proceed to Define the Extent of Off-Site Groundwater Pollution by LEHR-Site-Derived Wastes? **Yes**

Reference as: "Lee, G. F., 'Environmental Pollution at the UCD - DOE LEHR National Superfund Site & Its Implications for Adverse Impacts on Public Health, Environment, and Groundwater Resources: A Status Report,' Report G. Fred Lee & Associates, El Macero, CA (1996)."

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