UCR Pesticide Waste Pits
Site Remediation

ETOX Seminar

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Laboratory/Research Safety Manager
UCR Environmental Health and Safety
UCR Project Managers

- Lynn Beckmann
  - Now Self Employed
- Ken Borngrebe
  - Now at SoCal Edison
- Maggie Souder
  - Now at UCSD
Overview

- Location
- History
- Initial clean-up efforts
- New “discoveries” & litigation
- DTSC, SCAQMD, Cal/OSHA
- The second clean-up effort
- Closure
- Groundwater monitoring
The Site
Location

[Map of the location with University of California Riverside marked and other relevant locations nearby.]

UCR Botanic Gardens
Belvedere Heights
W Big Springs Rd
Mt Vernon Ave
Islander Park
Palos Verdes
Wendover Ave
Aliso Rd
Mastina Ave
History of UC Riverside

- **February 14, 1907**
  - The Riverside Citrus Experiment Station, the forbearer of the University, opens for business.

- **1940**
  - Researchers begin disposal of pesticide waste in trenches as it is safer than sending it to the local municipal landfill.

- **April 21, 1948**
  - Governor Earl Warren signs legislation authorizing the University of California to open campuses in Riverside and Davis, earmarking $2 million for initial planning and design costs.

- **July 30, 1952**
  - UCR holds ground-breaking ceremonies. Construction begins immediately on Webber Hall, Geology, Physical Education, Watkins Hall and Life Sciences.
December 7, 1953
- The first library building is completed and opens on Dec. 24 stocked with 33,000 volumes.

February 15, 1954
- One hundred and twenty-seven students and 65 faculty members arrive for their first day of classes. The next day, Charles Young is elected student body president. He later becomes chancellor of UCLA.

June 20, 1954
- The first 20 students graduate from UCR.

October 19, 1954
- UCR is officially dedicated.
August, 1955
- The big "C" on Box Springs Mountain is made with cement and equipment donated by the E.L. Yeager Construction Co. Surveying work is done by students. At 132 feet long, it is the largest concrete block letter on record.

1955
- “Highlanders” is adopted as the campus mascot following a vote of the student body. The Scottish theme is embraced for several campus groups and buildings.

April 18, 1959
- UC Regents vote to make UCR a "general" campus, complete with graduate instruction and professional schools.
1960
- The College of Agriculture is founded, successfully combining the work done at the Agricultural Experiment Station with undergraduate and graduate teaching.

October 2, 1966
- The carillon tower is dedicated.

February 2, 1967
- UCR offers a Bachelor of Science degree for the first time to students majoring in chemistry, geology or physics.

December 2, 1970
- U.S. Environmental Protection Agency opened its doors in downtown Washington, D.C.
Discovery of the Site

- **1972**
  - The ‘Pesticide Pits’ disposal site is capped and abandoned

- **Early 1970’s**
  - EPA sends our questionnaires looking for hazardous waste sites
  - Someone affiliated with UCR reports a “Boiling Acid Toxic Waste Pits” site in Ag Ops
  - UCR site bumps to the top of the federal superfund list
  - Three years later EPA lawyers visit site and downgrade it to a State Superfund Site

- **May 16, 1984**
  - Chancellor Tomás Rivera suffers a heart attack and dies. On Feb. 19, 1985, the library is officially named for him.
Initial Clean-up Effort

- **November 1989**
  - Investigation and remediation activities at the Site were implemented with DTSC guidance and approval under an enforceable agreement.

- **June 1997**
  - McLaren/Hart, Inc. was selected as the primary remediation contractor to perform on-site soil remediation using its specially designed and patented Low Temperature Thermal Desorption (LTTD) technology.

- **September 1997**
  - McLaren/Hart suspended remedial activities at the Site based on its allegations that: (1) two polynuclear aromatic hydrocarbon compounds (PAHs) – benzo(a)pyrene and dibenzo(a,h)anthracene – were present on Site soil but had not been disclosed and could not be treated by its LTTD system, and (2) elevated total urinary arsenic had been detected in four McLaren/Hart employees.
Lawsuit

December 1997
- McLaren/Hart filed a lawsuit against the University. During the litigation, McLaren/Hart added allegations that asbestos and elevated mercury may be present at the Site.

1997-1998
- DTSC required additional characterization work to be performed.
- The assessment showed results consistent with those detected during previous investigations and it was concluded that the original remedial approach was appropriate, but the limits of the affected areas were extended.

April, 1998
- Students approve a plan for UCR’s athletics teams to join NCAA Division I. In March 2000, UCR is accepted into the Big West Conference.
Final Clean-up Began

- **December 21, 1998**
  - McLaren/Hart lawsuit was settled, and McLaren/Hart’s involvement in the project was terminated.

- **February 1, 1999**
  - Opening bid meeting for completing the remediation is held

- **December 17, 1999**
  - The project resumed with a new contractor, American Integrated Services.

- **June 23, 2000 through February 1, 2002**
  - Excavation of soil and waste
  - Excavated material was classified either as soil with no visible waste, soil containing chemical waste, or soil containing debris.
  - Soil suspected or known to contain chemical concentrations above Site cleanup goals was treated on-site using the TTU.
Recent UCR History

- **April 15, 2005**
  - The UCR Palm Desert Graduate Center opens.

- **November, 2006**
  - The University’s plans for a medical school are accepted

- **February 3, 2006**
  - Department of Toxic Substances Control approval of the Site Remediation and Closure Report was received

- **December 20, 2006**
  - DTSC sends UCR closure letter with deed restrictions and monitoring requirements
Agencies Involved

- Department of Toxic Substances Control (DTSC)
- South Coast Air Quality Management District (AQMD)
- California Occupational Safety & Health Administration (Cal/OSHA)
Soil

- Thousands of glass, metal, cardboard, and plastic containers were removed and samples were analyzed. Samples were taken from both chemical containers and pure chemical product found in the soil.
- February 2002 Soil excavation concluded
- October 3, 2000 → July 30, 2002 Soil treatment
- Thermally treated soil from the site was reused
- The remaining excavated soil met human health risk assessment goals without treatment and was also used as backfill at the Site
- ~ 2074 tons of clean soil was imported to the Site
- December 2002. Backfilling and grading operations completed
Volumes

- ~ 38,400 tons of soil were excavated, of which approximately 21,240 tons were treated on-site using low temperature thermal desorption (LTTD).
  - The remaining soil either met the approved Site cleanup criteria or was transported off-site to a licensed disposal facility.
- ~ 732 tons of hazardous chemical waste was transported off-site for incineration.
- ~ 846 tons of hazardous debris was transported off-site for land disposal.
- ~ 18 tons of municipal waste was transported to a local municipal landfill for disposal.
Site Photo February 2001
Thermal Treatment Unit

2000 - 2001

- Problems fixed
  - Water re-circulation
    - New clarifier
  - Oxidizer build-up
    - Expanded treatment chamber
- Productivity increased
TTU rates

UCR On-Site Soil Treatment

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Discoveries

- New areas containing bottles/chemicals were found
  - Confirmation samples exceeded clean-up goals
    - Over-exavcation reveals more chemical containers
  - Exploratory trenches
    - Trenching to delineate the pits reveal more containers
  - Sloping excavation walls
    - Fetal Pigs discovered between the Northern Chemical Pits and the Central Trash Zone
    - Small pocket of chemicals
Regulatory Developments

- **Risk Model Approach**
  - Why?
    - Treated soil not meeting clean-up criteria
      - PCB concentrations higher than previously reported
    - Re-treatment would increase costs/time
    - Soil from Southern Trash Zone
    - Areas 3 & 4 may be left in place

- **Reduced number of analytical methods**
  - Discontinued or limited 3 test methods
Costs

Factors

- Increases:
  - Areas of chemical excavation increased
  - Incineration material cost increased from new chemical discoveries
  - Amount of material to hazcat increased

- Cost savings:
  - Less soil needing treatment
  - Reduced analytical cost
  - Moved hazcating to lab (fume hood)
The Site
Chemical Disposal Areas
HazCat
Hazcat Area inside Compounding Bldg
New Chemical Disposal Areas

Pesticide Pits Remediation

UCR EH&S
Biological Pit Discovered
July 2001 Site Photo
February 3, 2006

Ms. Maggie Souder  
Health and Safety Department  
University of California Riverside  
600 University Avenue  
Riverside, California 92521-0306.

APPROVAL OF SITE REMEDIATION AND CLOSURE REPORT, FORMER PESTICIDE WASTE PITS SITE, UNIVERSITY OF CALIFORNIA RIVERSIDE

Dear Ms. Souder:

The Department of Toxic Substances Control (DTSC) has reviewed the revised pages for the Site Remediation and Closure Report, revised in January 2006. DTSC approves the Report. This satisfies the requirement for finalizing a remedial action completion report. DTSC appreciates the cooperation of the UCR Health and Safety Department, Geomatix Consultants, and the Regents of the University of California throughout this challenging process. We look forward to the signing and recording of the Land Use Covenant as soon as possible. Please contact me if there are any questions regarding the latest, hopefully final, draft of the Land Use Covenant.

One minor housekeeping item remains regarding the subject Report. The cover page to the Health and Safety Plan is labeled as Appendix A, but Appendix A contains the "Investigation of Geophysical Anomalies" section, in the single-volume version. I suggest you create an Appendix K for the Health and Safety Plan. If you agree, please send a cover page labeled "Appendix K" and a revised page iii for the Table of Contents.

If you have any questions, please contact me at (714) 484-0401.

Sincerely,

Greg Holmes  
Unit Chief  
Southern California Cleanup Operations Branch — Cypress Office

cc: See next page
GROUNDWATER ELEVATION CONTOUR MAP
February 1, 2008
UC Riverside Pesticide Waste Pits
Riverside, California

By: Ira
Date: 3/27/08
Project No: 4528.002

Geomatrix

Note:
1. All locations are approximate.
2. Groundwater elevations in feet above mean sea level.
Water Contamination?

Never found chemical in the groundwater about closure limits

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<th>Analytical Parameter</th>
<th>EPA Method</th>
<th>Monitoring Wells</th>
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<tr>
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Costs

- Total costs for Pits Project ~ $20 million
- Annual costs for Site maintenance ~ $35,000 to $40,000 for the next 5 years
- Beyond 5 years costs will be dependant upon ground water monitoring results.