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AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

Agency for Toxic Substances and Disease Registry

Purpose of the Presentation

- To communicate our assessment of the Spring Valley
  - Environmental and health data
  - Community concerns and surveys
  - Scientific literature related to diseases of community concern

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Overall Conclusion

- No community-wide adverse health effects expected as a result of American University Experiment Station (AUES) activities.
- Excluding burial pits/disposal areas, contaminants in Spring Valley are below levels that could cause adverse health effects.

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Arsenic

No Adverse Health Effects Expected

Soil Concentrations, Estimated Exposure Doses

Exposure Investigations:
Hair
Urine
Dust

DC DOH Arsenic-related Cancer Study

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Other (Non-Arsenic) Contaminants

No Adverse Health Effects Expected

Contaminants at low levels and infrequently detected outside of burials

Contaminants released more than 80 years ago have degraded and in general have become less toxic

Low environmental persistence of many AUES chemicals (except for some contaminants like metals)

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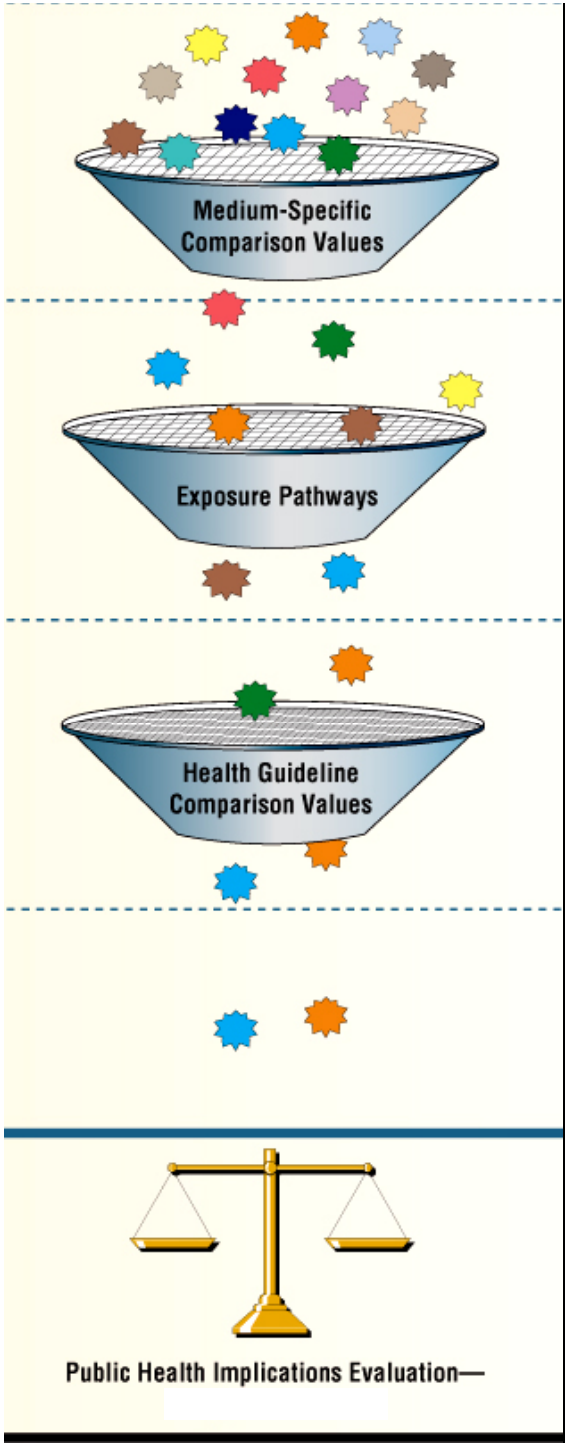


Preliminary Screening of Chemicals

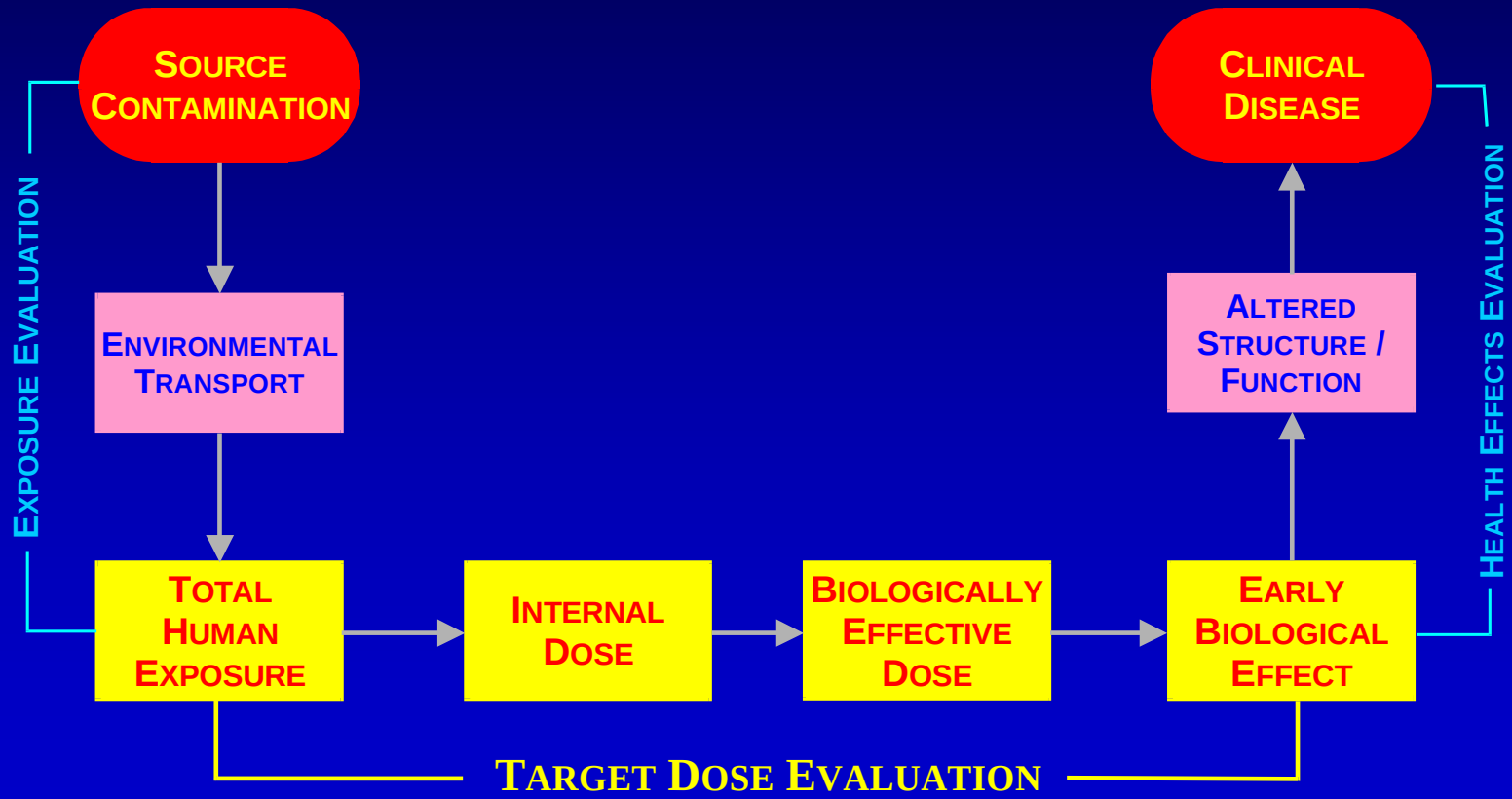
Pathway Evaluation

Exposure Dose Comparison

Contaminants of Concern

Public Health Implications

Continuum for Relating Environmental Contamination with Clinical Disease



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Spring Valley Soil Data

- Area-wide sampling for arsenic
- Central Testing Area- Sampling for chemical warfare agents (CWAs) and their breakdown products and/or explosives and their transformation products based on presence of a Point of Interest
  - A boring was taken from each property
  - Each boring was analyzed for arsenic; analysis for other constituents was dependent on Point of Interest
- Comprehensive Sampling Area- Sampling for CWA and their breakdown products on 15% of properties
  - Targeted soil borings also conducted at these properties
- AUES list sampling results for OU4 residences, Sedgwick Trench, the Child Development Center (CDC), and American University lot 12

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Additional Environmental Sampling

- Burial pits/disposal areas - soil, glassware, munitions
- Air data - indoor samples from two residences
- Water data - arsenic concentrations in municipal water system

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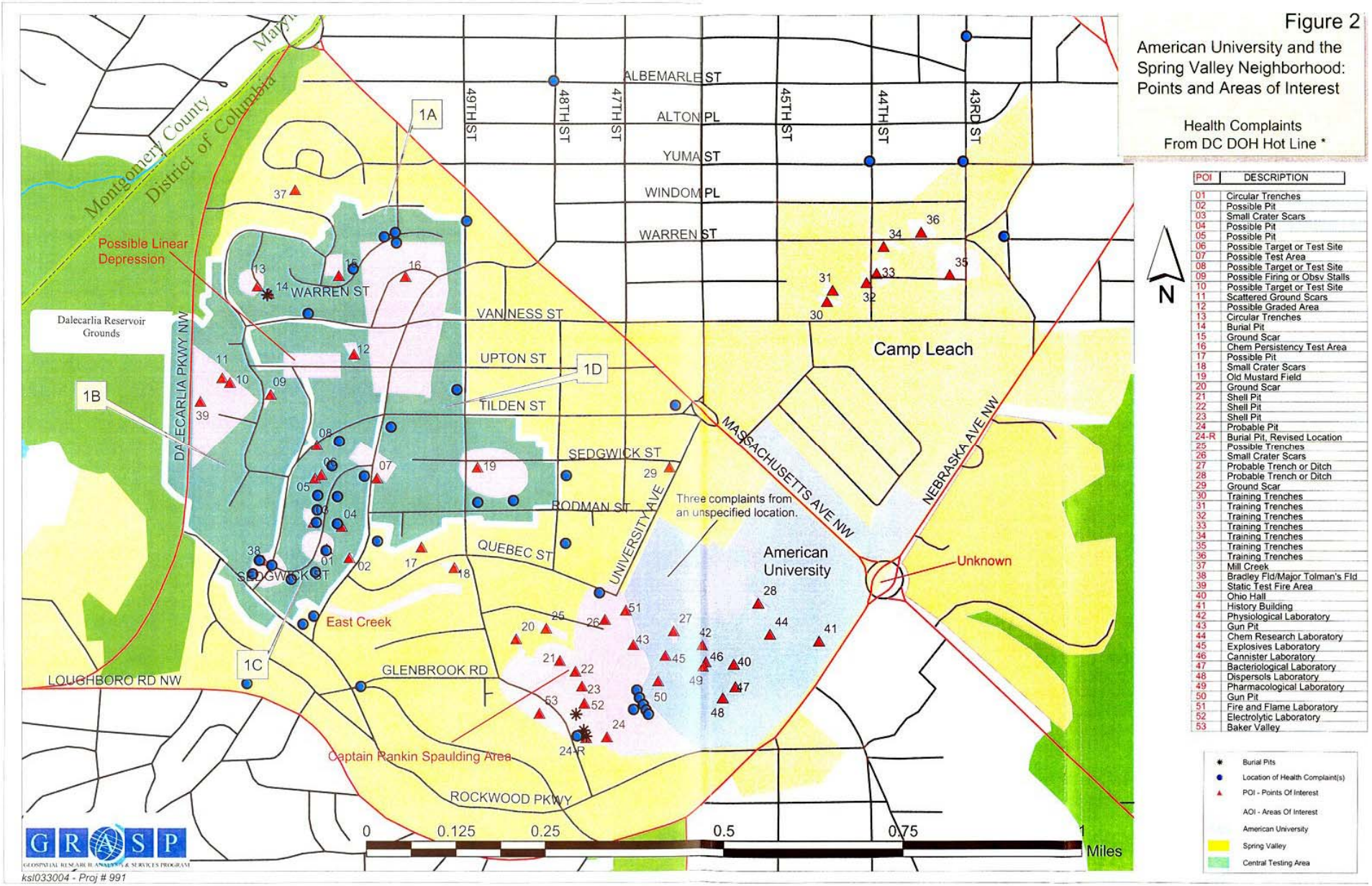
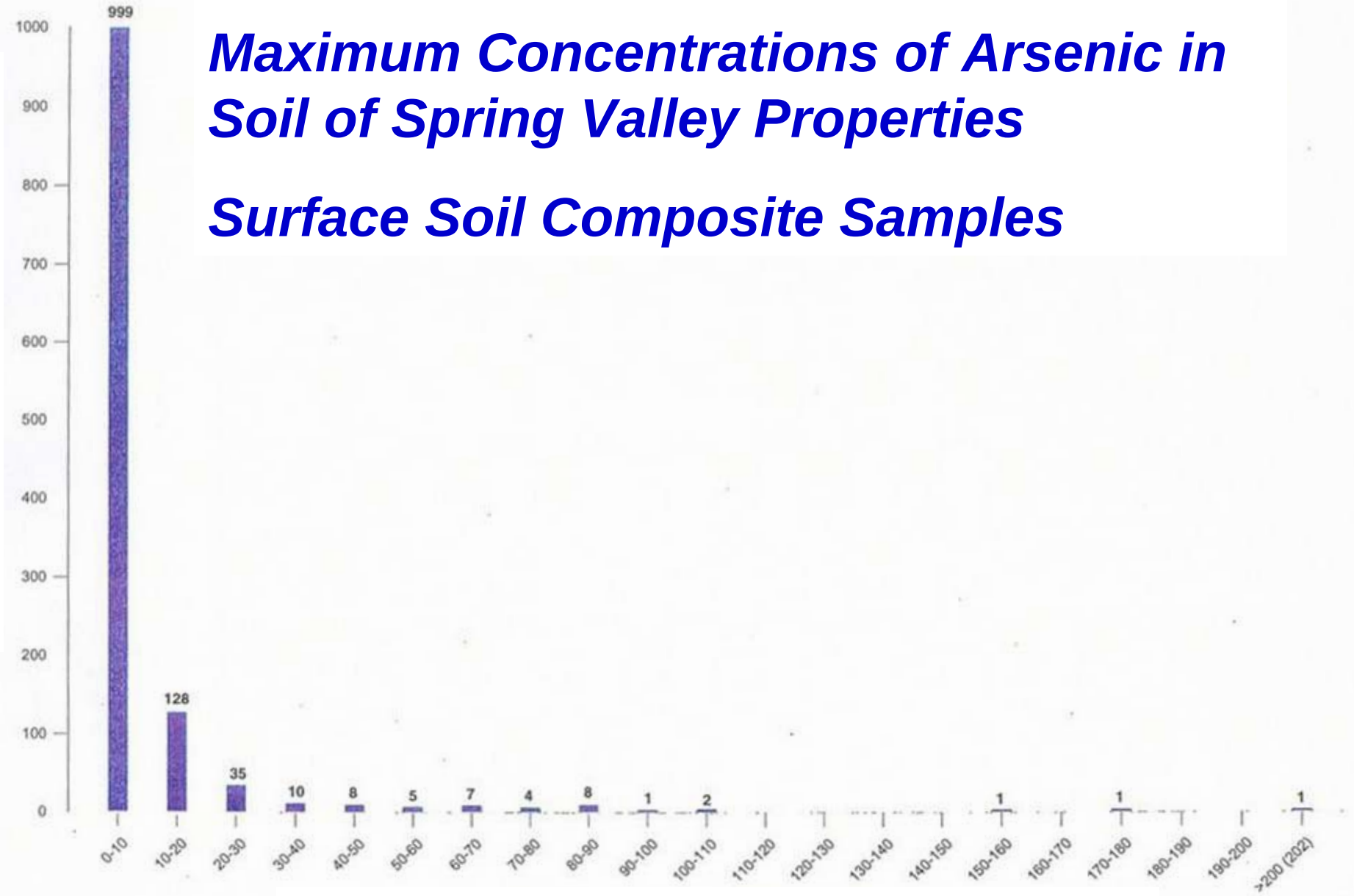


Figure 2
American University and the Spring Valley Neighborhood: Points and Areas of Interest
Health Complaints From DC DOH Hot Line *
Montgomery County
District of Columbia
Possible Linear Depression
Dalecarlia Reservoir Grounds
DALECARLIA PKWY NW
1A
1B
1C
1D
ALBEMARLE ST
ALTON PL
YUMA ST
WINDOM PL
WARREN ST
VAN NESS ST
UPTON ST
TILDEN ST
SEDGWICK ST
RODMAN ST
QUEBEC ST
49TH ST
48TH ST
47TH ST
45TH ST
44TH ST
43RD ST
MASSACHUSETTS AVE NW
NEBRASKA AVE NW
UNIVERSITY AVE
Camp Leach
American University
Three complaints from an unspecified location.
Unknown
East Creek
GLENBROOK RD
LOUGHBORO RD NW
Captain Rankin Spaulding Area
ROCKWOOD PKWY
N
0 0.125 0.25 0.5 0.75 1 Miles
GRASP
GEOSPATIAL RESEARCH ANALYSIS & SERVICES PROGRAM
ksl033004 - Proj # 991
POI DESCRIPTION
01 Circular Trenches
02 Possible Pit
03 Small Crater Scars
04 Possible Pit
05 Possible Pit
06 Possible Target or Test Site
07 Possible Test Area
08 Possible Target or Test Site
09 Possible Firing or Obsv Stalls
10 Possible Target or Test Site
11 Scattered Ground Scars
12 Possible Graded Area
13 Circular Trenches
14 Burial Pit
15 Ground Scar
16 Chem Persistency Test Area
17 Possible Pit
18 Small Crater Scars
19 Old Mustard Field
20 Ground Scar
21 Shell Pit
22 Shell Pit
23 Shell Pit
24 Probable Pit
24-R Burial Pit, Revised Location
25 Possible Trenches
26 Small Crater Scars
27 Probable Trench or Ditch
28 Probable Trench or Ditch
29 Ground Scar
30 Training Trenches
31 Training Trenches
32 Training Trenches
33 Training Trenches
34 Training Trenches
35 Training Trenches
36 Training Trenches
37 Mill Creek
38 Bradley Fld/Major Tolman's Fld
39 Static Test Fire Area
40 Ohio Hall
41 History Building
42 Physiological Laboratory
43 Gun Pit
44 Chem Research Laboratory
45 Explosives Laboratory
46 Cannister Laboratory
47 Bacteriological Laboratory
48 Dispersols Laboratory
49 Pharmacological Laboratory
50 Gun Pit
51 Fire and Flame Laboratory
52 Electrolytic Laboratory
53 Baker Valley
Burial Pits
Location of Health Complaint(s)
POI - Points Of Interest
AOI - Areas Of Interest
American University
Spring Valley
Central Testing Area

Maximum Concentrations of Arsenic in Soil of Spring Valley Properties

Surface Soil Composite Samples



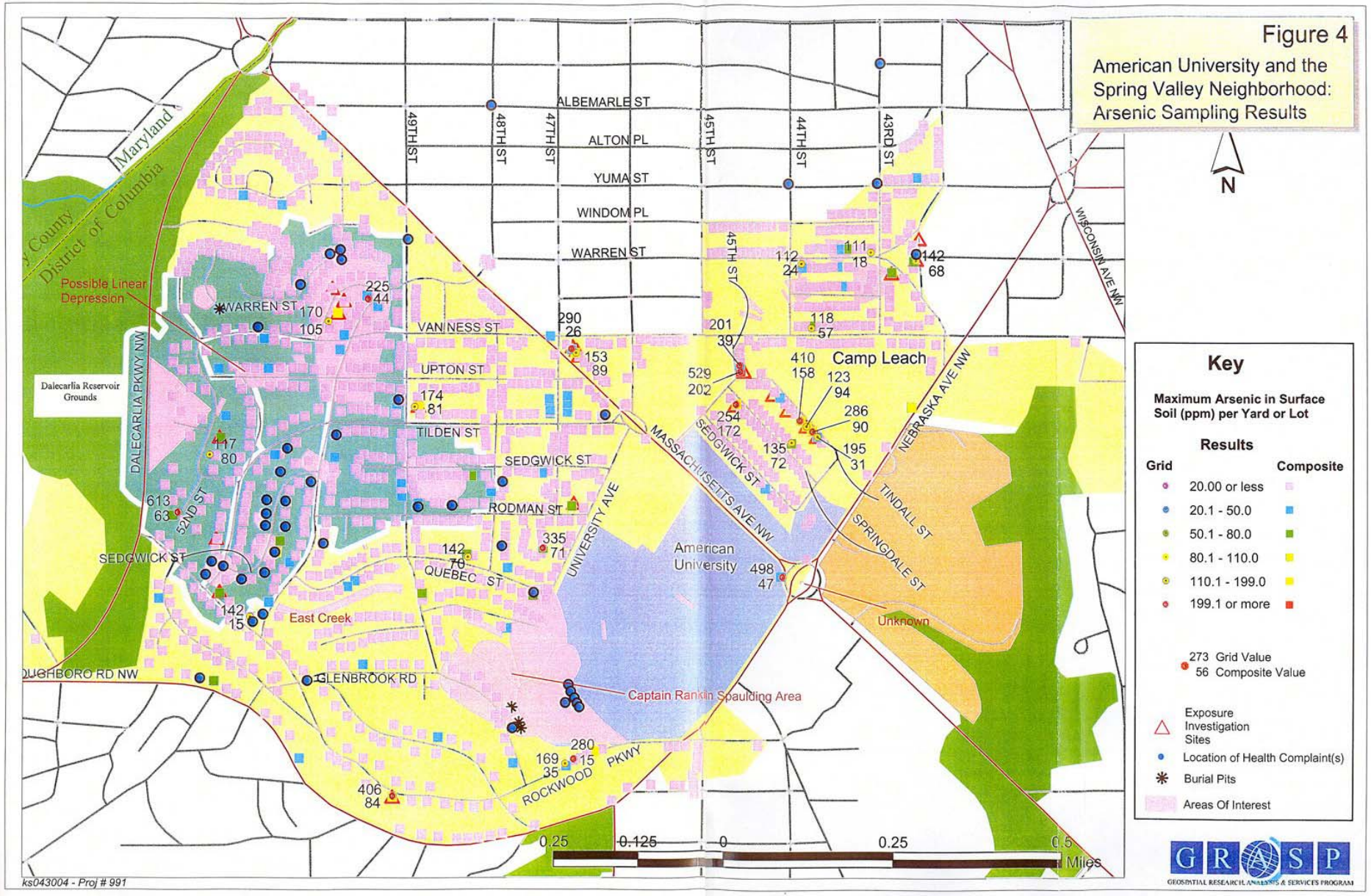


Figure 4
American University and the Spring Valley Neighborhood: Arsenic Sampling Results
N
Maryland
District of Columbia
Possible Linear Depression
Dalecarlia Reservoir Grounds
DALECARLIA PKWY NW
WARREN ST
VAN NESS ST
UPTON ST
TILDEN ST
SEDGWICK ST
RODMAN ST
QUEBEC ST
ALBEMARLE ST
ALTON PL
YUMA ST
WINDOM PL
49TH ST
48TH ST
47TH ST
45TH ST
44TH ST
43RD ST
WISCONSIN AVE NW
NEBRASKA AVE NW
MASSACHUSETTS AVE NW
UNIVERSITY AVE
52ND ST
TINDALL ST
SPRINGDALE ST
GLENBROOK RD
ROCKWOOD PKWY
East Creek
American University
Camp Leach
Captain Rankin Spaulding Area
Unknown
0.25 0.125 0 0.25 0.5 Miles
Key
Maximum Arsenic in Surface Soil (ppm) per Yard or Lot
Results
Grid
Composite
20.00 or less
20.1 - 50.0
50.1 - 80.0
80.1 - 110.0
110.1 - 199.0
199.1 or more
273 Grid Value
56 Composite Value
Exposure Investigation Sites
Location of Health Complaint(s)
Burial Pits
Areas Of Interest
GRASP
GEOSPATIAL RESEARCH, ANALYSIS & SERVICES PROGRAM
ks043004 - Proj # 991

Exposure Investigations

Sampling results indicate that harmful exposures are not occurring:

- February 2001, Child Development Center (CDC) [hair]
- February 2001, Washington Occupational Health Association Investigation, CDC [hair, urine]
- March 2002, Spring Valley residents with the highest concentrations of arsenic in their yards [hair, urine, indoor dust]
- Summer 2002, Spring Valley residents who participated in March 2002, conducted during soil removals [urine]

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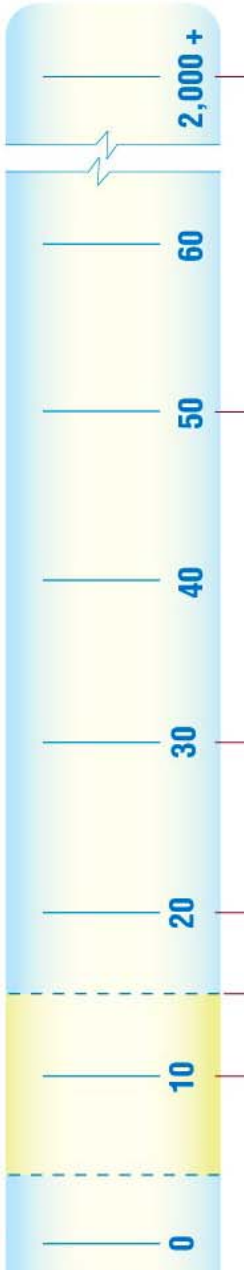
Comparison of Spring Valley Arsenic Doses with *Lowest* Levels Reported to Cause Illness / Disease

Units: (10-3 mg/kg/day)

* Assumes possible acute exposure of up to 529 ppm arsenic in soil and possible longer-term exposure of up to 202 ppm arsenic in soil.



- Death
- Blood / Bone Marrow Effects (Anemias)
  More Notable GI Effects
- Peripheral Neuropathy
- Cardiovascular Effects
- Skin Effects

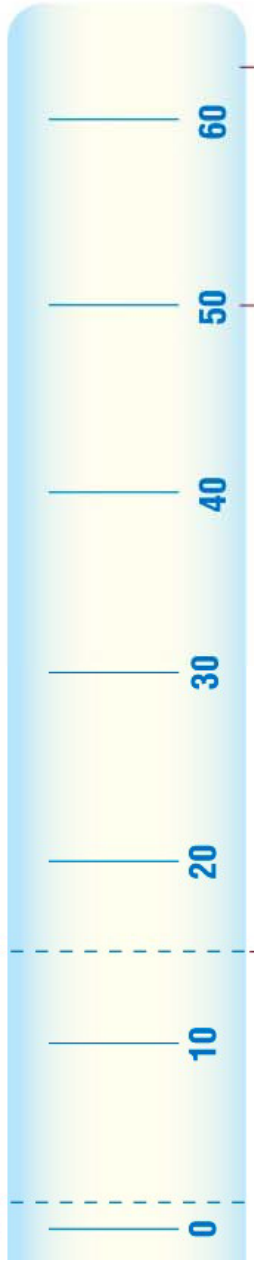
Poss. Detoxification Range -

Site Dose Estimates* -

- Mild GI Effects

Comparison of Spring Valley Arsenic Doses with *Lowest* Reported Cancer Effect Levels

Units: (10^{-3} mg/kg/day)



- Liver Cancer

- Bladder, Kidney, Urethral Cancer

- Skin, Lung Cancer

Range of Uncertainty -

Site Dose Estimates* -

* Assumes possible exposure at up to 202 ppm arsenic in soil

DC DOH Study on Arsenic-related Cancers

- Cancers evaluated: urinary bladder, melanoma skin, lung, liver, and kidney
- Compared Spring Valley area with
  1. an adjacent tract, and
  2. a tract in Potomac, MD
- No excesses of arsenic-related cancer incidence and mortality during the study period 1987-1998

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Other Contaminants in Soil (ppm)

Contaminant	Max. Value Residences Surface	Max. Value CDC AU Lot12 Subsurface
Benzo(a)-pyrene	0.720J	1.1J
Phosphorus	1,530	678
Thiodigylcol TDG	0.813J	0.732J

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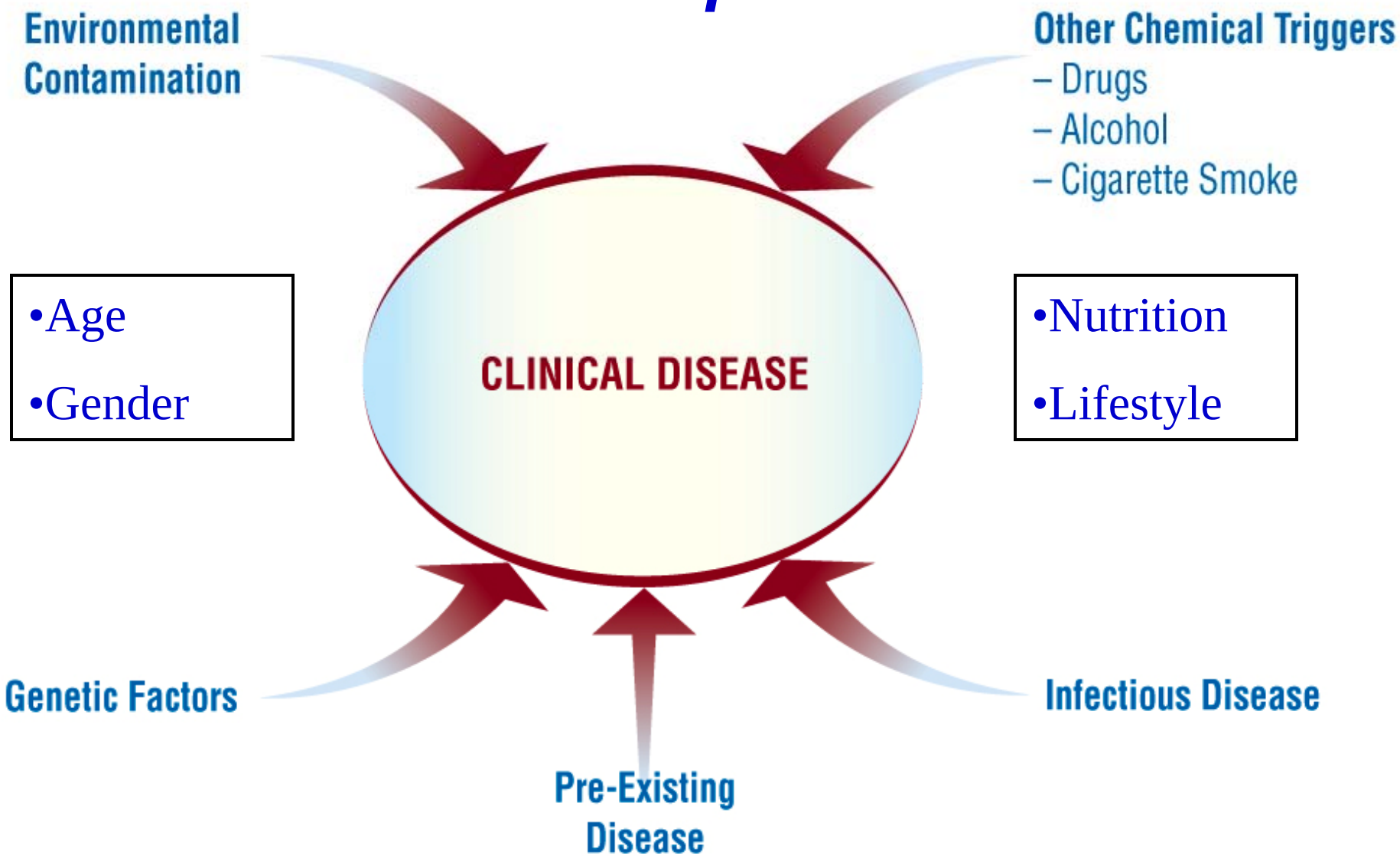
Multiple Factors Associated with Disease Development



DC DOH Hotline Records

- March 2001-2002
- one or more reported illnesses or health conditions from 46 separate residences
- a wide range of conditions reported
- more than one-third of the conditions were disorders of the blood and bone marrow
- ATSDR evaluated brain cancer mortality rates: SV Ward 3 rates similar to DC area and to national rates

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Community Surveys of Self-reported Health Conditions

- Adverse health conditions reported in 61 residences (expanded to 161 residences). Results similar to DC DOH hot-line reports (reporting from additional residents provided additional cases of leukemias and peripheral neuropathy)
- ATSDR evaluated the 1999 leukemia mortality rate for SV Ward 3: approximately twice as high as the DC rate and the national rate

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Community Concerns

- Do contaminants associated with American University Experiment Station cause the types of disease found in Spring Valley?
  - Yes.
- Are contaminant levels in the environment high enough to cause these diseases?
  - No. Except for burial pits/disposal areas, contamination in site soil, air, and water are below levels that would cause harm to children and adults.

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Conclusions

- *Soil*- not expected to result in adverse health effects
- *Burial pits and shallow disposal areas*- potential for exposure to hazardous materials if their contents are tampered with or disturbed
- Arsenic and other chemicals are below levels that could cause adverse health effects

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Environmental Recommendations

- Targeted surface-soil sampling of selected residential yards
- Continue soil gas sampling near burial pits/disposal areas
- Monitor groundwater near burial pits/disposal areas

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Recommendations to Residents

- Call USACE (410-962-0157 or 800-434-0988) if suspicious objects are found in your yard
  - If there is any concern regarding an item possibly being a munition, you should call 911
- Do not collect or handle such objects - remove any such objects presently in the home
- Follow the guidance in the brochure *Safe Gardening, Safe Play, and a Safe Home*
- Report suspect illnesses to your physicians and direct them to ATSDR's healthcare providers link at www.atsdr.cdc.gov/sites/springvalley

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Health Follow-up

- Although no exposure to contamination that would lead to leukemia has been found, the DC DOH could determine any excess rates by evaluating the incidence and mortality of these diseases.

- ATSDR recommends that contaminant levels in exposure pathways continue to be addressed.

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ATSDR Contacts

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- **Loretta Bush, Community Involvement**

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- **Richard Sullivan, Health Education and Promotion**

  404-498-0521 rsullivan@cdc.gov

- **Dr. Alden Henderson, Health Investigations Branch**

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Comments on Public Health Assessment

- Mail comments to:

  Records Center
  ATSDR
  ATTN: Spring Valley Chemical Munitions
  1600 Clifton Road, N.E. (MS E-60)
  Atlanta, GA 30333

- Comments Due Date Extended
  - now due by April 29, 2005

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