

Contaminated Soils Forum

February 1, 2000
Jacksonville, Florida

DEP Staff Notes Revised

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Bob DeMott, Contaminated Soils Forum (CSF) Co-Chair, began the meeting with a summary of the October 1999 meeting and the outstanding issues that the Methodology Focus Group (MFG) addressed during the past several months. For a detailed explanation of these issues and MFG's directions from the CSF see the October 1999 staff notes. The group's findings and recommendations are summarized later in these notes.

Note: References to focus group papers, reports or presentation materials are found throughout these notes. If the individual or group responsible for generating the materials has provided an electronic copy to the DEP Staff, it has been placed on the DEP website at <http://www.dep.state.fl.us/dwm/programs/csf>. If you cannot locate the materials on the website, then please contact the presenter or group for a copy of their materials.

Next Meeting Scheduled:

Wednesday, May 17th was selected for the next CSF meeting. The location will be in Tallahassee at the DEP, Twin Towers Building, 2400 Blair Stone Road, Room 609. The meeting will convene at **9:30 a.m.** An agenda when available will be mailed before the May meeting.

Invited Guest Speaker for May Meeting:

Dr. Lena Ma was invited as a guest speaker for the May meeting. She will present an update on the research study: [Background Concentrations of Trace Metals in Florida Surface Soils](#) ((Continuation Study), Drs. [Lena Ma](#), Arthur Hornsby and Willie Harris, University of Florida.

For the latest on this research study, visit the website at:
http://www.floridacenter.org/publications/exec_97-7.pdf

Arsenic Task Force Meeting:

The Arsenic Task Force met in November 1999 at DEP in Tallahassee. The meeting's objective was to update the Department of Agriculture and others on arsenic issues that the task force has worked on or is presently working on:

- [Risk assessment of organic verses inorganic arsenic](#);
- The toxicity of [arsenite and arsenate](#); and
- Ongoing bioavailability study.

For copies of the technical reports on the first two issues visit the websites:
<http://www.floridatox.org> or <http://www.floridatox.org/techrept.htm>

Arsenic Update:

The CSF's morning sessions were scheduled for discussions and presentations on arsenic. Dr. Roberts, University of Florida presented an overview on arsenic. For a copy of his handouts and details of his presentation, visit: <http://www.dep.state.fl.us/dwm/programs/csf>.

Dr. George Parrish, American Wood Preservers Institute, presented a viewpoint on an approach to calculating a practical threshold level for arsenic and a historical perspective on the understanding and background for transformation of cells into a cancer cell. The presentation was titled: Arsenic Biochemistry and Risk Assessment. Dr. Parrish distributed a paper entitled Arsenic: Biochemistry and Risk Assessment of a Threshold Carcinogen. A copy of the paper or the handout may be obtained by contacting Dr. Parrish at the e-mail address: gparrish@awpi.org.

Dr. Bob DeMott commented on the national and state-specific arsenic research issues that Dr. Steve Roberts' presentation highlighted. The two national issues are: (1) the study used as the basis for the oral cancer slope factor and (2) the method used to extrapolate risks to low doses. The state-specific issues are: (1) the arsenic bioavailability from soils study currently underway and (2) the natural background levels of arsenic in soils in Florida (Dr. Ma's report). The arsenic bioavailability study results are expected later this summer. Dr. DeMott stated that the CSF and the DEP should continue their efforts and involvement in the two national issues.

Recommendations of MFG by Dr. Bob DeMott:

Dr. DeMott presented the MFG's recommendations on several issues researched since the October meeting of the CSF. The recommendations are:

1. Revise the acute toxicity soil cleanup target levels (SCTLs) for the following constituents: copper, fluoride, nickel, and vanadium.
 - Copper would increase from 110 mg/kg to 140 mg/kg due to new toxicity information (0.09 mg/kg/day).
 - Fluoride would increase from 500 mg/kg to 750 mg/kg due to a change in the uncertainty factor.
 - Nickel would increase from 110 mg/kg to 350 mg/kg. This change was the result of using a "modifying factor" of three instead of the uncertainty factor of 10.
 - Vanadium would increase from 15 mg/kg to 55 mg/kg due to using a "modifying factor" of three.
 - All final SCTLs changes are subject to verification of the calculations and for rounding.
2. Several constituents were not recommended for changes.
 - The SCTLs for cadmium, cyanide, and phenols will remain the same.
 - The SCTL for barium will remain the same. At this time the research is not conclusive as enough to make a change.
3. The MFG recommended continuing the research for any impact on SCTLs from the new Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance Dermal Risk Assessment, Interim Guidance, EPA 1999 (EPA/540/R-99/005) that is due out in June 2000. The UF team will report back to the MFG in April on any updates. It was agreed by key stakeholders who initially raised concerns during the brownfields cleanup rule adoption hearing that they were comfortable with delaying any changes based on dermal considerations

until further review by the UF team. However, everyone agreed that if the new EPA dermal guidance was not released by June that the DEP should go forward with rulemaking based on the new body weights, surface areas, and inhalation rates.

4. It was recommended to use the new body weights, surface areas, and inhalation rates for any future rulemaking calculations of SCTLs.
 - The revised body weights are for: a child - - 17.1 kg; a resident - - 52.5 kg.; and a worker - - 76.9 kg.
 - The new surface areas are for: a child - - 1770 cm²; a resident - - 4080 cm²; and a worker - - 2490 cm².
 - The new inhalation rates are for: a child - - 8.1 m³; a resident - - 12.2 m³; and a worker - - 20 m³.

NOTE: For future copies of or updates to the Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance Dermal Risk Assessment, Interim Guidance, EPA 1999 (EPA/540/R-99/005) contact the EPA's Hotline at hotline_oswer listserv (electronic mailing list). Information about electronic mailing list (listserv) subscriptions is available at the following URL:

<http://www.epa.gov/epaoswer/hotline/listsrv.htm>

For additional questions regarding Federal EPA regulations developed under RCRA, UST, CERCLA/Superfund, OPA, EPCRA, and Section 112(r) of the Clean Air Act, the Hotline is available at:

(800) 424-9346 -- Toll Free
(800) 553-7672 -- Toll Free TDD

The MFG reported that any changes in the disassociation constant for equations used to develop new default leachability SCTLs for some metals (i.e., lead) were not useful. Also, the MFG reported that the "aggregate" person was protective of women.

The UF toxicology team prepared and passed out [comments](#) on the "Proposed Modifications to Identified Acute Toxicity-Based Soil Cleanup Target Levels (SCTLs)", (prepared by Hazardous Substance and Waste Management Research, Inc., on behalf of the Florida Electric Power Coordinating Group).

Dr. DeMott continues to research the "uncertainty factor" used in the derivation of toxicity variables.

The **MFG next meeting** is scheduled for **April 13, 2000**, in Gainesville on the University of Florida's campus. For future updates, directions, and a copy of the agenda visit the CSF website at: <http://www.dep.state.fl.us/dwm/programs/csf>.

Cleanup Focus Group (CFG) Update:

Discussion on "[Global](#)" [RBCA](#) and its application were deferred to Doug Jones' presentation.

Updates on Global RBCA:

Doug Jones presented the status of where the DEP is with proposing [Global RBCA](#) legislation. A bill has been proposed to apply RBCA principles to the “non-program” sites including RCRA. Several issues were raised by stakeholders: (1) Applicability Section; (2) definitions such as “discharges, hazardous substances, and the use of RCRA terminology; (3) application of legally applied pesticides and herbicides; and (4) “grandfathering” of existing sites. Mr. Jones stated the DEP was not attempting to increase the department’s authority outside the present regulatory authority only to apply the same cleanup target levels and RBCA principles to all contaminated sites regardless of the type of site - - program or non-program. One stakeholder stated he would like for the draft bill to clearly state that no new liability was created, only that the draft bill created a process for remediation where existing liability existed. Mr. Jones indicated that the comments received would be helpful in redrafting the [Global RBCA](#) bill and he appreciated the opportunity to receive everyone’s comments in the forum.

Communication Focus Group (CommFG):

Dr. Joe Sekerke presented the CommFG update. The group’s draft paper [Proposal to Design, Develop, and Deliver A Framework for Effective Communication with an Emphasis on Risk Communication](#) was handed out. The proposal outlines a process. The CommFG is searching for a funding source to assist in production of the video and travel expenses. A pilot project is anticipated to cost \$20, 000 to \$30,000.

Ecological Risk (EcoRisk) Focus Group:

Ed Zillioux presented an update and summary. On 1 October 1998, the EcoRisk Focus Group provided the following principal recommendation to the CSF:

- "Develop Florida-specific ecological risk assessment guidelines for contaminated soils that use, as a framework or point of departure, the USEPA Guidelines for Ecological Risk Assessment."

In response to an FDEP question on whom would develop these guidelines, the EcoRisk Focus Group polled its members and a core group was identified whose members would be willing to serve on a Guidelines Development Committee on a volunteer basis. At the June 1999 CSF meeting, the EcoRisk Focus Group reported that it was preparing a Position Paper to support its principal recommendation to develop Florida-specific EcoRisk guidelines. At the February 2000 CSF meeting a status report on the Position Paper added the following draft recommendations, all relating to Ecological Soil Screening Levels, or EcoSSLs:

- 1) Before making a blanket endorsement of the Region IV Recommended Eco-SSLs, FDEP should carefully consider their applicability to the State of Florida.
- 2) Eco-SSLs in Florida should be based on ecological-effects data for terrestrial species known to occur within the state. Critical data gaps, such as reptilian dose-response data, need to be filled in order to make the ERA guidelines more protective of Florida ecosystems.
- 3) Eco-SSLs should consider the issue of bioavailability associated with the variable soil characteristics throughout the state.
- 4) Eco-SSLs should not be adopted by Florida regulatory agencies prior to the adoption of a tiered ERA framework (i.e., an EcoRBCA).

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- 5) Eco-SSLs should be used during the screening-level risk assessment process as one of several lines of evidence. They should not be used as cleanup goals.

The draft EcoRisk Assessment Focus Group Position Paper is scheduled for completion and distribution to CSF members by 1 April 2000.

Discussion re: Short-term Goals for the CSF and for Focus Groups

The MFG continues to work on previously identified issues regarding the new EPA Dermal Guidance. The MFG meets on April 13 to finalize the issues.

The writing and distribution of a paper on the application and derivation of the “uncertainty factors” used in toxicity variables should be finalized.

The issue on how RBCA should apply to reuse and recycling is still ongoing.

The DEP continues its development of a “Registry of Institutional Controls.”



Arsenic Update

- Toxic effects of arsenic are well described. Clinical arsenic poisoning is associated with gastrointestinal, cardiovascular and neurological symptoms.
- Arsenic is classified as a “known human carcinogen” (USEPA Group A; IARC Group I).
- Arsenic is carcinogenic by inhalation. Evidence comes from studies of lung cancer in workers.
- Arsenic is also carcinogenic by ingestion. Evidence comes from studies of people exposed to arsenic in drinking water in Taiwan, Mexico, Argentina, and Chile. There is also evidence from people who used Fowler’s solution medicinally (contains arsenic).
- Arsenic ingestion associated with cancer of the skin, bladder, lung, kidney, and liver.



Arsenic Update

- USEPA has developed a cancer slope factors (CSFs) for both arsenic ingestion and inhalation.
- For exposure to soil, ingestion is usually the dominant pathway.
- USEPA oral CSF for arsenic is based on risk of skin cancer among a large (approx. 40,000 individuals) population in Taiwan exposed via drinking water.
- Using the USEPA oral CSF, a 1×10^{-6} risk, and standard exposure assumptions, the SCTL for arsenic in FL is 0.8 ppm; the analogous USEPA SSL is 0.4 ppm.
- Arsenic risk assessment has received a great deal of attention, brought into focus by a Congressional mandate to revise the arsenic drinking water standard.



Arsenic Update

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- Areas of contention include the study on which the oral CSF is based (Tseng et al., 1968) and the method for extrapolating cancer risk for low-dose exposures.
 - Primary criticisms of Tseng et al. (1968) have been with the dose estimates and the nutritional status of the subjects in the study.
 - Issue of extrapolation to low doses not unique to arsenic. However, some have suggested that arsenic is among the chemicals for which the linear extrapolation method used by the USEPA is inappropriate.
 - For soil exposure, there are two other issues: 1) bioavailability of arsenic from soils; and 2) comparison with natural background levels.



Arsenic Update

- Four basic areas of contention in arsenic risk assessment are:
 - » 1) study used as the basis for the oral CSF
 - » 2) method used to extrapolate risks to low doses
 - » 3) arsenic bioavailability from soils
 - » 4) natural background levels of arsenic in soils
- First two are national in scope (should apply no matter where the arsenic contamination occurs); second two include regional considerations.
- Approach by FDEP has been to monitor national debate and USEPA actions on the national issues (1&2) and conduct pro-active research on the second issues (3&4).



Arsenic Update

- Research on natural background levels of arsenic (and other inorganics) in Florida soils.
 - » Dr. Lena Ma at UF is PI
 - » Provides data on arsenic concentrations in various soil types in various locations throughout Florida
 - » Results indicate that majority of sites (70-80%) have natural arsenic concentrations at or below the 0.8 ppm residential SCTL.
- Research on bioavailability of arsenic in soils
 - » Drs. S. Roberts and R. Bergeron at UF are PIs
 - » Study is ongoing
 - » Measuring arsenic bioavailability from different types of contaminated sites in Florida
 - » Also evaluating correlation with inexpensive test methods for estimating bioavailability.



Arsenic Update

- Monitoring the debate includes:
 - » Following the scientific literature
 - » Attending major symposia and conferences on arsenic
 - » Following relevant reports;
 - “Guidelines for Carcinogen Risk Assessment” (1996, 1999)
 - Expert Panel on Arsenic Carcinogenicity (1997)
 - NRC report “Arsenic in Drinking Water” (1999)
- Where are we now?:
 - » USEPA will propose a new drinking water standard for arsenic in the next few months.
 - » It will be based on a study of bladder cancer from ingestion of arsenic in drinking water.
 - » It will be based on linear extrapolation to low doses.