

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

REGION 2
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December 16, 1994

Commanding Officer
Western Division
Attn: Mr. Ernesto Galang, Code 1813
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066-0720

Dear Mr. Galang:

COMMENTS TO REVISED PROPOSED APPROACH TO ESTABLISH BACKGROUND AND AMBIENT LEVELS IN SOILS, DRAFT (AUGUST 11, 1994)

The Department of Toxic Substances Control has obtained additional review of the subject document. Specific comments are enclosed. If you have any questions regarding this letter, please contact me at (510) 540-3818.

Sincerely,

Mary Rose Cassa

Mary Rose Cassa
Engineering Geologist
Office of Military Facilities

Enclosures

cc: Mr. Michael Bessette
California Regional Water
Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
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75 Hawthorne Street
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Admin Record (3 copies)

Jim Sullivan (NSTI)

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**DEPARTMENT OF TOXIC SUBSTANCES CONTROL
COMMENTS TO REVISED PROPOSED APPROACH TO ESTABLISH BACKGROUND AND
AMBIENT LEVELS IN SOILS, DRAFT (AUGUST 11, 1994)**

General Comments

1. The test methods used by the Navy for Yerba Buena Island are consistent with EPA guidance (U. S. EPA, 1989b and 1994); however, the Navy should consult Chapter 6 of the latter reference for the method of estimating sample size for the Wilcoxon rank sum test (= Mann Whitney test) for specified Type I and Type II error rates and specified probability that a measurement of a sample at a random site location is greater than a measurement of a sample at a random background location.

For Treasure Island, the proposed approach does not address Type I and Type II errors. The U. S. EPA (1989a, Chapter 6) recommends a one-sample t-test for comparing the mean concentration of a constituent at a site to regulatory threshold level (e.g., PRG or ER-L) which considers the probability of Type I and Type II error rates. A sample size formula is also provided. This EPA statistical approach should also be used for TI soils if an inorganic constituent in a site soil is significantly above background per the first approach (i.e., YBI). Also, geostatistical methods can be used to map either (1) concentration isopleths (ordinary kriging) or (2) probabilities of exceeding regulatory threshold levels (indicator kriging (U. S. EPA, 1989a, Chapter 10 and U. S. EPA 1991)).

Specific Comments and Recommendations

2. The title does not reflect the contents of the text. More correctly the title should be: ". . . proposed approach for comparing levels of inorganic constituents in site soils to levels of inorganic constituents in background soils and regulatory threshold levels."
3. In the proposed approach for YBI (Section 3.1.2), the Navy assumes that the data are normally distributed. This assumption has neither been stated or verified. The Wilcoxon rank sum test should be used if the data are not normally distributed; and it may be used even if data are normally distributed.
4. The Navy should use caution in comparing Naval Station Treasure Island analytical data to literature background levels because (1) literature values are generally based upon total sample digestion methods, whereas TI and YBI values are probably based upon a partial sample digestion method (i.e., EPA Method 3050) and (2) soils in the cited bay area studies may not represent similar soil parent materials at YBI.

5. U. S. EPA Region IX California modified PRGs (August 1, 1994) and NOAA ER-L values are acceptable to DTSC as screening values under certain conditions. "CAL-Modified PRGs" published in the August 1, 1994 PRGs from U. S. EPA Region IX should be used for screening cadmium, hexavalent chromium, lead, nickel and compounds, 1,2-dibromo-3-chloropropane (DBCP), benzo(a)pyrene (water only), tetrachloroethene (PCE), chrysene, and benzo(k)fluoranthene.

References Cited

- U. S. Environmental Protection Agency. 1989a. Methods for Evaluating the Attainment of Cleanup Standards. Volume 1: Soils and Solid Media. Office of Policy, Planning, and Evaluation, Washington, D. C., February 1989 (EPA 230/02-89-042).
- U. S. Environmental Protection Agency. 1989b. Soil Sampling Quality Assurance User's Guide, Second Edition. Environmental Monitoring Systems Laboratory, Las Vegas, NV, March 1989 (EPA/600/8-89/046).
- U. S. Environmental Protection Agency. 1991 GEO-EAS 1.2.1 User's Guide. Environmental Monitoring Systems Laboratory, Las Vegas, NV, April 1991 (EPA 600/8-91/008).
- U. S. Environmental Protection Agency. 1994. Statistical Methods for Evaluating the Attainment of Cleanup Standards. Volume 3: Reference-Based Standards for Soils and Solid Media. Office of Policy, Planning, and Evaluation, Washington, D. C., February 1994 (EPA 230-4-94-004).