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Cal/EPA

Department of
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October 24, 1996

Mr. Kurt Baer
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**RESPONSE TO COMMENTS ON DRAFT REMEDIAL INVESTIGATION
(RI) REPORT LONG BEACH NAVAL SHIPYARD (LBNSY), LONG
BEACH, CALIFORNIA**

Dear Mr. Baer:

The California Environmental Protection Agency (Cal/EPA) has completed its review of *the Response to Comments on the Draft Remedial Investigation Report Long Beach Naval Shipyard, Long Beach, California (Draft RI Report)*, dated June 20, 1996. The Draft RI was prepared by Bechtel National, Inc.

The Response to comments were received by Cal/EPA on September 30, 1996. Cal/EPA found the Navy's responses to our comments were acceptable with one exception. Before accepting the Navy's responses regarding geochemical correlations for copper and zinc in soils, which affects selection of inorganic constituents of potential concern, Cal/EPA requires some additional information on this issue.

The Department of Toxic Substances Control (DTSC) has compiled comments on this response to comments from its internal technical staff which are enclosed with this letter. The Los Angeles Regional Water Quality Control Board (LARWQCB) discussed the responses to comments with Navy's contractor via conference call on October 8, 1996. Navy's contractor agreed to submit minutes of the conference call to document changes on the responses to comments on the *Draft RI Report*.



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If you have any questions, please contact me at (310) 590-5565.

Sincerely,



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SPECIFIC COMMENTS

1. **Copper:** In Figure E-19 of the *Draft RI*, the Navy showed a cumulative probability plot with two main populations for copper in the non-native fill materials which form the surface soil at Long Beach Naval Complex. The separation point between the two populations lies at about 55 mg/kg, while the limit of the upper population lies near 650 mg/kg. The Navy invoked a geochemical argument that high total organic carbon (TOC) in soil can immobilize copper by forming stable organocopper complexes. They asserted that the higher population of copper values represented these complexes and was therefore part of the ambient conditions at this base. Using both populations to describe ambient conditions, the 95% upper tolerance limit on the 95th quantile (UTL_{95,95}) was estimated at 639 mg/kg for copper. DTSC commented (#3, p. 5) that ambient conditions were confined to the lower of these two populations (≤ 55 mg/kg), unless the Navy could demonstrate that the geochemical correlation of copper and TOC was operating locally.

DTSC reminded the Navy that the use of sandblast grit at this base could have resulted in releases of copper to soils and sediments. Also, TOC in soils or sediments might represent releases of fuel hydrocarbons attributable to the Navy. Thus, DTSC is cautious about expanding the definition of ambient conditions for copper according to the mechanism the Navy proposes.

At the project meeting on October 3, 1996, the Navy announced that too few data on TOC were available for soils to make the correlation, but data on both TOC and copper were available from Operable Unit 3, Site 7 of LBNC, the West Basin of the harbor. The Navy presented preliminary data showing a geochemical correlation between copper and TOC in sediments in the West Basin of the harbor. The upper limit of the ambient distribution of copper in these sediments is about 650 mg/kg, which agrees very well with the soil data.

Because some (perhaps most) of the hydraulic fill covering Terminal Island came from this harbor or from similar sediments nearby, DTSC is inclined to accept the Navy's argument that both populations of copper concentrations may be considered ambient for the non-native soils at this base. However, DTSC will require the Navy to quantify this correlation. At the very least, the value for the correlation coefficient (r^2) should be calculated and presented. Perhaps a regression line with confidence limits

about its slope would lend additional support to their argument. Lastly, the Navy should examine the areal distribution of high values for copper in soil, because "hot spots" from releases could be responsible rather than a basewide geochemical mechanism.

2. **Zinc:** The Navy invokes the same argument for zinc as for copper, but no supporting data are presented. If the argument is valid for both metals, then some supporting evidence should be available from either soils or sediments. As with copper, quantification of any putative causal relationship is desirable.