

TECHNICAL MEMORANDUM

Ecological Risks from Ground Water at NCBC IR Site 08

Prepared for:

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Northern Division
Naval Facilities Engineering Command
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TO: Christine Williams, EPA Region I and Richard Gottlieb, RIDEM

FROM: Phil Otis, Navy RPM, NCBC Davisville

SUBJECT: Evaluation of Ecological Risk from Ground Water at IR Site 08

Discussions among Navy, EPA, and other Base Realignment and Closure Cleanup Team (BCT) participants in April 1997 resulted in the discontinuance of a basewide ground-water evaluation in favor of a site-specific approach. Accordingly, the Navy was tasked with assessing risk to both human health and the environment from ground water at individual Installation Restoration (IR) sites. To address ecological risk from ground water, the Navy developed a stepwise protocol that first involved screening chemical constituents in ground water against protective criteria such as Ambient Water Quality Criteria (AWQC) or background. If any constituent exceeds screening criteria, the hydrogeology of the site is investigated to determine if ground-water constituents from historical releases at a site could have reached surface water and sediment in the watershed in which the site is located, prior to surface water/sediment sampling in the mid-1990s. If migration of ground-water constituents is judged to be likely, then surface water and sediment concentrations are examined to determine whether they may have resulted from ground water.

At Site 08, implementation of the full stepwise protocol is rendered unnecessary because none of the chemical constituents in ground water being examined for risk exceeded screening criteria in wells on and downgradient of Site 08. Data evaluated for ecological risk include low-flow sampling data from the Phase II Remedial Investigation (RI) (TRC 1994) and background (Stone & Webster 1996). The ground water data indicate that a single constituent, aluminum, exceeded the screening criterion in the Sandhill Brook Watershed background well (MW-WD-2), approximately 1,700 ft to the southwest and upgradient of Site 08 (Figure 1). The aluminum concentration of 13,200 ug/L in this well exceeded the screening criterion (background) of 5,315 ug/L. However, it should be noted that the background screening value for aluminum was based on the 95 percent Upper Confidence Limit (UCL) on the mean of all Base background wells, therefore a concentration from an individual background well can exceed the background screening level. None of the onsite or downgradient wells at Site 08 contained aluminum in excess of the screening criterion. The source of the aluminum in the background well is unknown, but is assumed to be natural since aluminum is a typical constituent of most soils.

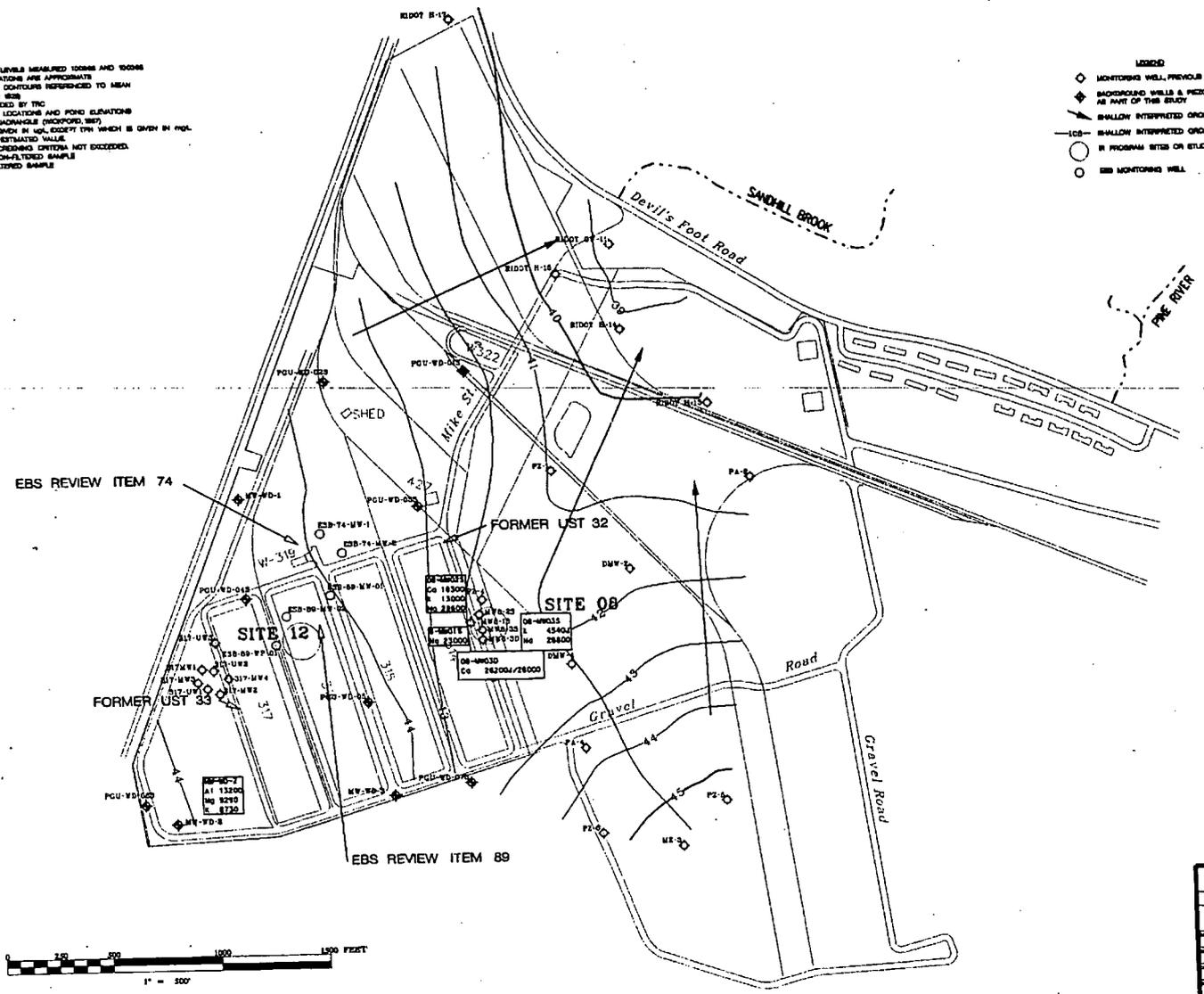
The fact that none of the constituents screened for ecological risk in ground water exceeded screening criteria in Site 08 wells permits a determination of no ecological risk in the Sandhill Brook Watershed from Site 08 ground water.

References

- Stone & Webster. 1996. *Basewide Ground Water Inorganics Study Report NCBC Davisville, Rhode Island*. Prepared for Department of the Navy, Northern Division, Naval Facilities Engineering Command, Lester, Pennsylvania. Stone & Webster Environmental, Boston, MA.
- TRC. 1994. *Draft Final Remedial Investigation Report: Naval Construction Battalion Center, Davisville, Rhode Island*. Prepared for Northern Division, Naval Facilities Engineering Command, Lester, Pennsylvania. TRC Environmental Corporation, Windsor, CT.

NOTES:
 1. GROUND WATER LEVELS MEASURED 1000AM AND 1000PM
 2. MOUNTING WELL LOCATIONS ARE APPROXIMATE
 3. ELEVATIONS AND COORDINATES REFERENCED TO MEAN SEA LEVEL (MSL) 1929
 4. BASE MAP PROVIDED BY TIC
 5. SURFACE WATER LOCATIONS AND POND ELEVATIONS FROM USGS QUADRANGLE (PROPOSED 1987)
 6. ALL UNITS ARE GIVEN IN VOL. EXCEPT TYP. WHICH IS GIVEN IN PGL.
 7. J INDICATES AN ESTIMATED VALUE.
 8. NE INDICATES SCREENING CRITERIA NOT EXCEEDED.
 9. NF INDICATES NON-FILTERED SAMPLE
 10. F INDICATES FILTERED SAMPLE

LEGEND
 ◆ MOUNTING WELL, PREVIOUS INVESTIGATIONS
 ◆ BACKGROUND WELLS & METERINGS INSTALLED AS PART OF THIS STUDY
 ↗ SHALLOW INTERPRETED GROUND WATER FLOW DIRECTION
 --- SHALLOW INTERPRETED GROUND WATER SURFACE CONTOUR
 ○ IN PROGRAM SITE OR STUDY AREA
 ○ EBS MOUNTING WELL



SANDHILL BROOK WATERSHED ECOLOGICAL	
FIGURE 1	
BARRON'S CRUISE WATER STUDY - HONG DAVISWELLA SHOOT ISLAND NAVY FACILITIES ENGINEERING COMMAND	
Date: 07/87 Drawn by: PWS Title: EBS Scale: 1" = 500' Project: TPO Project Number: 84-0000A Date: 10/87	STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES 34 RADGEM STREET BOSTON, MA 02239

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