DEPARTMENT OF THE NAVY
CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE INDIANA 47522-5001

IN REPLY REFER TO:
5090/S4.7.1
Ser 095/3295
26 AUG 2003

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Illinois, Indiana, and Michigan Section
ATTN: Mr. Peter Ramanauskas (DW-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NSWC Crane) submits responses to comments by the U. S. EPA and change pages as enclosures (1) and (2), respectively for the Final RCRA Facility Investigation (RFI) Report for the Dye Burial Grounds (DBG), Solid Waste Management Unit 02/11. The permit required Certification Statement is provided as enclosure (3).

NSWC Crane point of contact is Mr. Thomas J. Brent, Code 09510, telephone 812-854-6160.

Sincerely,

James M. Hunsicker

JAMES M. HUNSICKER
Director, Environmental
Protection Department
By direction of the Commander

Encl:
(1) Response to Comments on the DBG RFI Report
(2) Change Pages for DBG RFI Report
(3) Certification Statement

Copy to:
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SOUTHNAVFACENGCOM (Code ES32) (w/o encl)
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TTNUS (Ralph Basinski) (w/o encl)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

James M. Hurnicki
SIGNATURE

Environmental Protection Department Manager
TITLE

Aug 26, 2003
DATE

5090
Ser 095/3295

26 August 2003

The letter Ser 095/3295 was for the submittal of the response to comments and updated pages for the Final RCRA Facility Investigation (RFI) Report for the Dye Burial Grounds, SWMU 02/11. The pages have been incorporated into the previously submitted report dated 7/10/02 (Ser 2232).

Responses to
U. S. EPA March 2003 Comments
on DBG

Enclosure (1)

US EPA REGION 5 COMMENTS (JUNE 24, 2003)
ON
NAVY RESPONSES (MARCH 26, 2003) TO US EPA REGION 5 COMMENTS (JANUARY 8, 2003)
ON
DRAFT RFI REPORT (JUNE 2002)
FOR
NSWC CRANE SWMU 2 (DYE BURIAL GROUNDS)

Gentlemen,

We have reviewed Crane's responses to comments for the DBG RFI. As mentioned in my previous email on the Responses to Comments for the ORR RFI, one question that persists by the reviewers is the use of limited background data for comparisons of certain soil types. For future work, would the Navy consider collecting additional background samples at SWMUs where soils types are present for which the BW Background study was unable to collect greater than 5 data points?

Response to Additional Comment – No Number:
It should also be noted that a larger number of background samples, by itself, does not necessarily result in greater statistical validity. The degree of confidence that is obtained in decision making is influenced by the amount of variability in the data and the minimum difference that must be detected between the data statistic (e.g., the mean) and an action level or another statistic. The degree of confidence generally increases with the number of samples but specifying a minimum number of samples for collection without consideration of these other factors may lead to decision confidence that is too low (or too high, depending on the cost of data collection, etc.). The Navy considered decision errors when planning the NSWC Crane base-wide background soil investigation. It was those considerations that led to the conclusion that three samples were needed to satisfy the specified decision error criteria. That is, collecting at least three samples from each soil type would provide a sufficient amount of data to meet the specification -- under the assumed conditions. Recognizing that the assumptions could be in error, the Navy decided to collect at least *five* samples of each soil type rather than just three.

The Navy has already identified situations where additional background samples may be collected. In cases where local conditions such as adjacent site operations or localized geology can affect background or parameters analyzed, additional background samples may be collected. Details are provided in Section 3.3.1 of the Background Report (TtNUS, January 2001).

The Navy will also consider collection of additional background samples in situations where soil groups are encountered for which less than six samples were collected during the background study. Any such decisions would be made either during the planning or field investigation phases. If discovered during the planning phase the locations of additional background samples will be addressed in the planning document. US EPA Region 5 will be able to review and approve the locations of background samples during review of the planning document (QAPP). If the need to collect additional background samples is discovered during the field investigation phase collection of additional background samples and their location will be determined in the field. The additional data would only be used for the calculation of a new background for the soil group.

Although the Navy is willing to consider collection of additional background samples as described above, in most instances collection of additional background samples acceptable for use in the database may be extremely difficult. Numerous criteria were identified in the Background Study (Section 3.3.1) for determining acceptable locations of background samples. These criteria are as follows.

1. Within NSWC Crane boundary
2. Soil composition similar to the soils encountered in the presently defined SWMUs and across NSWC Crane.
3. Unaffected by past or present Navy activities
4. Approximately 400 feet from primary or secondary roads
5. Approximately 400 feet from any developed areas

6. Upwind from any sites releasing airborne emissions
7. Not down slope from any slope

The Navy anticipates that it will be extremely difficult to find locations meeting all of these criteria. The selection of sites unaffected by past or present Navy activities is the most difficult criterion to meet. In the initial background study an objective was established to collect five samples for each soil group. After two sampling rounds it was determined that it would be cost prohibitive (over $250,000 was expended) to collect additional backgrounds samples. Given the efforts conducted to date to create the background database, the Navy does not believe it is cost-beneficial to attempt a third round of sampling for two soil groups.

Remaining comments follow:

Comment SC-8: The response appears to adequately address the original comment. However, more information is needed to adequately justify monitoring well 02-05 as a "background well". While the information provided in the revised RFI Report, including groundwater elevations, does indicate that Well 02-05 could be considered hydraulically upgradient of the capped area, more historical information is needed. Provide historical groundwater elevation data or reference to data to indicate that this monitoring well is and has been hydraulically upgradient of the capped area and is therefore reliably assumed to be unaffected by site activities.

Response to Additional Specific Comment SC-8:

An additional review of available ground water elevation data for seven different water-level measurement events was conducted. The data are presented in the table below.

	Ground Water Elevations (ft msl)						
	Aug-88	Mar-91	Jun-91	Nov-91	Mar-92	Jul-01	Jun-02
Data Source	(1)	(1)	(1)	(1)	(1)	(2)	(3)
Upgradient Wells							
02C20P3	696.74	698.28	698.43	696.28	695.88	696.81	697.48
02C10P3	686.28	691.88	687.86	686.76	686.66	687.08	687.59
02C13P2	684.22	685.33	685.28	684.53	684.23	684.67	684.96
02-05	684.11	685.18	684.28	684.38	684.18	684.53	684.85
Wells Beneath or Immediately Downgradient of Capped Area							
02-06	684.07	684.97	684.87	684.17	684.12	684.01	684.38
02-07	685.13	684.81	684.41	683.91	683.86	683.37	683.65
02-08	683.34	684.27	683.82	683.37	683.32	682.98	683.28
02-02	681.70	682.67	682.07	681.72	679.82	681.97	682.36
02-04	680.12	681.32	680.62	681.07	679.97	680.64	681.25

There are few cases where one or more of the upgradient wells exhibits a ground water elevation that is less than the ground water elevation in one or more downgradient wells. These instances are highlighted in the table. Despite this situation, the data indicates that all of the wells labeled as "upgradient" in the table are upgradient of the wells that are labeled as "Wells Beneath or Immediately Downgradient of Capped Area." When the overall ground water gradient is reviewed (refer to Figure 1-10 of the Phase III RFI Report) ground water flow is from well 02-05 (and other upgradient wells) toward well 02-06 and other down gradient wells. Incidentally, the ground water contours depicted in Figure 1-10 of the Phase III RFI Report are nearly identical to those that were drawn a decade earlier by the US Army Corps of Engineers in: "Final Report: RCRA Facility Investigation, Phase III Ground Water Release Characterization, SWMU 02/11 Dye Burial Grounds, Naval Surface Warfare Center Crane, Indiana," by Murphy and Wade, July 1998.

Another consideration in selecting well 02-05 as an upgradient well was its close proximity to the DBG. Because of this it represents upgradient conditions immediately upgradient of the cap.

Based on the above data, the designation of well 02-05 as "upgradient" has not been changed. No changes have been made to the RFI Report in response to this comment.

HUMAN HEALTH RISK ASSESSMENT COMMENTS

Comment HHRA-1: The response does not appear to adequately address the original comment. The response contends that if the existing text were replaced, it would be inconclusive as to whether or not future action is necessary. However, Table ES-1 clearly states that NSWC Crane recommends No Further Action (NFA). At a minimum, the statement should be changed to read, "SWMU 2 incremental cumulative cancer risk for all human receptor pathways were estimated to be within, or less than, the EPA's National Contingency Plan risk range of 10(superscript: -6) to 10 (superscript: -4); therefore, NSWC believes the risk is acceptable."

Response: The third bulleted item of the conclusions on Page ES-3 has been revised to read as follows:

"SWMU 2 incremental cumulative cancer risks for all human receptor pathways were estimated to be within, or less than, the EPA National Contingency Plan risk range of 10^{-6} to 10^{-4}; therefore, the Navy believes the risk is acceptable."

Comment HHRA-5: The response appears to address the issue raised in the original comment. However, the information provided in the response should be included in the RFI text so that the document presents a complete description of potentially complete (and incomplete) exposure pathways.

Comment HHRA-5: The following text has been added to the beginning of the Ground Water subsection in Section 6.3.1.3 on page 6-12.

A detailed discussion of ground water at NSWC Crane is provided in Section 1.4. Ground water at NSWC Crane is not used for drinking water or any other purposes. Lake Greenwood, an 800-acre man-made, spring-fed lake in the northwestern portion of the installation (Figure 1-1), is the main source of water at NSWC Crane. Depth to ground water at SWMU 2 is 20 feet or deeper. Because of the ground water flow pattern and the distance of SWMU 2 from the nearest eastern NSWC Crane boundary (approximately, 2,760 feet to the west of NSWC Crane boundary), off-site drinking water sources would not be expected to receive recharge from site impacted ground water.

Comment HHRA-10: The information provided in the response appears to adequately address the content of the original comment. However, information justifying the likely exposure routes should still be provided within the text of the report in order to provide a clear presentation of site conditions.

Response: See response to Comment HHRA-5.

Comment HHRA-13: The additional text does not completely clarify the status of land use controls at SWMU 2. It is suggested that a more lengthy revision be made to the text, which includes the information presented in this response. The additional text could read: "The results of the RFI have indicated the need for land use controls at SWMU 2. The details of the land use controls, such as the type of controls to be used and the schedule in which they will be implemented, have not yet been established. Therefore, a land use control program is not currently in place at NSWC Crane."

The following text replaces the last sentence at the end of the third paragraph of Section 6.7.

"The results of the RFI have indicated the need for land use controls at SWMU 2. The details of the land use control, such as the type of controls to be used and the schedule in which they will be implemented, have not yet been established. Therefore, a land use control program is not currently in place at NSWC Crane."

ECOLOGICAL RISK ASSESSMENT COMMENTS

Comment ERA-1: The response to comment ERA-1 is not complete. Although the Scientific/Management Decision Point (SMDP) provided did contain most of the information requested, a few modifications are necessary to provide a complete SMDP. The examination of the spatial distribution of ecological effect quotients (EEQs) was not provided in the appropriate context. The new section, 7.5.1, Surface Soil, states that "Metal detections were spatially distributed evenly across SWMU 02 indicating no clear pattern of contamination...." While it is understood that the overall outcome of that statement might be that there are no ecological concerns regarding soils contamination at this site, future documents should contain further discussion on EEQ exceedances.

For example, it is appropriate to indicate that metals were detected across the site with regularity, however, based on this statement, it remains unclear if this distribution represents widespread contamination, or detection of background concentrations. Therefore, EEQs should also be discussed to show where exceedances occurred in order to determine if exceedances are widespread across the site; if exceedances are localized and are potential hotspots in need of further examination; if exceedances are minimal due to being highly localized and well bounded by surrounding samples to verify localization; or if no EEQ exceedances occurred. It is at this state that the magnitude of EEQ exceedance may be used (e.g., an EEQ exceedance for a chemical in a single sample is minimal, and is well bounded by surrounding samples that do not contain EEQ exceedances for that same chemical). Revise the RFI Report to incorporate these changes.

The requirements of the SMDP are not clear. It is the understanding of the Navy that the purpose of the SMDP after Step 2 is to determine if a site needs to proceed further in the ERA process and that the SMDP is not designed to further refine the list of COPCs. Therefore, it appears that the SMDP that has been provided for Dye Burial Ground is adequate to determine that the SWMU should proceed to the next step (i.e., Step 3a).

The Navy agrees that if a Step 3a evaluation was not being conducted then a detailed SMDP would be warranted. However, because most sites have chemical concentrations that exceed screening levels, the Step 3a process was implemented by the Navy to further refine the list of COPCs to determine if a "full-blown" Baseline Ecological Risk Assessment is necessary. It appears that the Navy Step 3a process is similar to what is being requested for in the SMDP. Under the Navy's tiered approach for ecological risk assessments, such topics as the magnitude of EEQ exceedance and spatial bounding of hotspots are considered in the Step 3a. Therefore, it is not necessary to repeat this discussion of the EEQs in the SMDP. Also, it is not necessary to discuss where the EEQ exceedences occur in the SMDP, because it will not change the determination for the need to proceed to Step 3a.

Mr. Aaron Bernhardt of TtNUS contacted Mr. Dan Mazur from USEPA Region 5 on July 16, 2003 to determine the need for a detailed SMDP section in the ERA. Mr. Mazur indicated that he was not aware of such a requirement and has not seen detailed SMDPs sections in other ERAs. He also agreed that if a detailed Step 3a was completed, the SMDP would be of limited value. He then recommended that TtNUS contact the Superfund division of USEPA, Region 5 (either Jim Chapman, Brenda Jones or David Brauner) to see if they have any requirements, because TechLaw may be following superfund guidance. Mr. Aaron Bernhardt contacted Mr. Jim Chapman on August 5, 2003. Mr. Chapman indicated there are usually discussions between the regulators and involved parties at the various decision points, but he has never seen the SMDP as a separate section of an ERA. Therefore, the Navy does not feel there is a need to make the SMDP more detailed than it already is, so no additional changes to the SMDP are proposed by the Navy. Also, for the same reasons, discussions on EEQs exceedences will not be included in future documents.

No charges have been made to the RFI Report in response to this comment.

Comment ERA-2: The response appears to adequately address the original comment, with the exception that reptile and amphibian receptors are not discussed in the comment. While it is understood that it is difficult to address this issue since toxicological data is scarce for these species, these receptors should still be addressed in the Uncertainties section. Revise the RFI Report to include this information.

The response to the original comment was added as the last paragraph in Section 7.7.1. Although the second to last paragraph in section 7.7.1 states that "risks to reptiles and amphibians were not evaluated because exposure factors are not established for most species, and toxicity data are very limited", the following sentence will be added to the end of the last paragraph.

"Finally, there are uncertainties in risks to reptiles because there is a lack of exposure factors for reptiles and a lack of reptile toxicity data for the detected chemicals."

Comment ERA-3, Section 7.2.6, Conceptual Site Model: The response appears to adequately address the original comment. However, a revised approach to the approved work plan should be considered for any additional sampling that may be conducted at the NSWC Crane facility. The revised approach should include a sampling strategy that incorporates soil intervals that are more reflective of typical ecological exposures, i.e., 0.0 to 0.5 ft bgs and 0.5 to 2.0 ft bgs.

Comment noted. The technical basis for the original comment is not clear. The original comment indicates that "the soil intervals typically used to evaluate ecological exposures is zero to 0.5 ft bgs for surface soil and 0.5 to 2 ft bgs for subsurface soil." The Navy is not aware of any state or USEPA guidance that indicates that soil samples should be collected from two depth intervals (0.0 to 0.5 ft bgs and 0.5 to 2.0 ft bgs) which are then evaluated separately. Ecological receptors can be exposed to contaminants in the soil at various depth intervals. For example, earthworms burrow deeper than six inches in soil, and the roots of plants reach deeper than six inches. Also, burrowing wildlife (which are not qualitatively evaluated in the ERA) are exposed to soil from the 0 to 2 foot interval as they pass through the soil. Therefore, the intervals sampled as part of this investigation (0' to 2' interval for dye parameters and 0' to 1' for inorganic parameters) are appropriate for evaluating risks to ecological receptors. As such, the Navy does not see the need for collecting surface soil samples from two depth intervals (0.0 to 0.5 ft bgs and 0.5 to 2.0 ft bgs) in future sampling events.

No charges have been made to the RFI Report in response to this comment.

Comment ERA-4, Section 7.4, Ecological Screening: The response to comment ERA-4 is incomplete. Although the technical approach is appropriate, a clarification of the approach is still necessary. It is thoroughly understood, both from the original review of the RFI Report and the review of the response to comments, that a statistical approach (i.e., a comparison of data sets instead of maximum detected concentrations) is used for comparing background data to investigative data for soil and sediment samples, and that a comparison of the maximum detected chemical concentrations to up-gradient water samples was used in the ecological risk assessment (ERA). However, Page 7-11 still indicates that chemicals of potential concern (COPCs) were selected for surface water, soil, and sediment, based on the following statement, "Inorganic contaminants whose maximum concentrations do not exceed the background concentrations are not retained as COPCs." Therefore, the information presented in the document still appears to be contradictory, and should be revised so that risk managers and other entities reviewing the final approved ERA document do not call into question the validity of the ERA approach. Revise the document to clearly delineate the approach for comparing investigative samples to background samples.

The first and second bullets under surface water and sediment, and the second bullet under surface soil on page 7-11 have been reworded as follows to clarify how background evaluations were used to select COPCs:

"Surface Water and Sediment for Benthic Macroinvertebrates, Fish, and Terrestrial Wildlife

- *Inorganic contaminants in the surface water whose maximum concentrations do not exceed the maximum concentration in the upgradient sample as discussed in Appendix F-2 are not retained as COPCs.*

- *Inorganic contaminant concentrations in the sediment that are not statistically elevated compared to upgradient/reference concentrations as discussed in Appendix F-3 are not retained as COPCs.*

Surface Soil for Invertebrates, Plants, and Terrestrial Wildlife

- *Inorganic contaminant concentrations that are not statistically elevated compared to the background soil data set, as discussed in Appendix F-1, are not retained as COPCs."*

DATA QUALITY COMMENTS

Additional Changes to Text: Page 38 states that despite the rejection of dye results from sample 02SS05000s, no other surface soil samples contained detectable concentrations of dyes. It appears that sample 02SS05000s should be listed as 02SS050002. For clarification, revise the section to correct this discrepancy.

This discrepancy has been resolved on Page 38 of the NSWC Crane Response to EPA Comments, dated June 2002. A replacement page is included.

Change Page Comments
on the DBG RFI Rev 0
Dated June 2002

Enclosure (2a)

were qualified as U. Clarify these discrepancies and revise the tables as necessary to ensure that consistent information is presented.

Response: Interpretation of the original Table 3-7 format is not intuitive and was not discussed in the RFI text. Each row of original Table 3-7 should be interpreted as the percentage of data associated with a particular qualifier code (e.g., P) that have been qualified as indicated (e.g., J or UJ).

Table 3-7 has been re-organized to present the data in a different, more intuitive, manner and is included as Attachment 5 to these responses to comments. The updated Table 3-7 presents, for a given qualifier, the percentage of data qualified as indicated for a particular reason. This essentially reverses of the original format.

The following specific example presents how updated Table 3-7 should be interpreted: For selenium, 100% of the "J" and "UJ" qualified data were qualified because of a LCS/LCSD non-compliance. Please notice that Table 3-7 does not incorporate "U" qualified data because data that were "U" qualified are non-detect data.

Comment SC-6:

Table 3-8, Qualification Rates for Soil Analytical Data. It appears that some of the qualification rates provided in Table 3-8 do not correspond with data provided in Appendix E Tables E.1-1, E.1-2, E.4 and E.5. For example, Section 3.3.3 and Table 3-8 indicate that all undetected Solvent Yellow 3 were qualified UR. However, the qualification information provided in the Appendix E Tables shows that Solvent Yellow 3 soils/sediment data were qualified as U, UJ or UR. In addition, data qualification percentages presented in Table 3-8 for Solvent Yellow 33 are unclear. Table 3-8 indicates that 100% of Solvent Yellow 33 data were qualified UJ due to LCS/LCSD non compliance, but also shows that 100% of the data were qualified U due to "other." However, Tables E.1-1, E.1-2, E.4 and E.5 contain both U and UJ qualified data. Clarify these apparent discrepancies and revise the tables as necessary to ensure that consistent information is presented.

Response: Similar to Table 3-7 (See Specific Comment SC-5), interpretation of the original Table3-8 format is not intuitive and was not discussed in the RFI text. Accordingly, Table 3-7 has been re-organized to present the data in a different manner per Specific Comment SC-5.

The following specific example presents how the updated Table 3-8 (Attachment 6 to these responses to comments) should be interpreted: For 2-aminoanthraquinone 3.7 percent of the "UJ" qualified data were qualified because of surrogate recovery non-compliance and other reasons; 96.3 percent of the "UJ" qualified data were qualified because of surrogate recovery non-compliance; 100 percent of the "UR" qualified data were qualified because of surrogate recovery non-compliance; and 7.1 percent of the "U" qualified data were qualified because of other. Please notice that Table 3-8 does not incorporate "U" qualified data because data that were "U" qualifier are non-detect data.

The following first sentence of the sixth paragraph in Section 3.3.3 has been deleted. The text in the last paragraph of Section 3.3.3 has been updated as follows:

"All dye results for samples 02SD010006, 02SD020006-D, 02SD050006, and 02SS050002 were rejected due to surrogate recoveries of less than 10 percent."

In addition, the following text has been added to the end of Section 4.1, Subsection Dyes:

"Despite the rejection of dye results from sample 02SS050002, no other surface soil samples contained detectable concentrations of dyes. Therefore, there is no expectation that dye contamination in surface soil was undetected as a consequence of analytical problems."

In addition, the following text has been added to the end of Section 4.5, Subsection Dyes:

"Despite the rejection of dye results associated with samples 02SD010006 and 02SD050006, no other sediment, ground water, or surface soil samples contained detectable concentrations of dyes. Therefore, there is no expectation that dye contamination in sediment was undetected as a consequence of analytical problems."

The holding time exceedance for mercury has been removed from Table 3-8. A new row has been added to Table 3-8 for cation exchange capacity holding time exceedance as parameter "Cation Exchange Capacity."