



Minnesota Pollution Control Agency

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

November 17, 1999

Commanding Officer
Southern Division
Naval Facilities Engineering Command
Attn.: Joel R. Sanders, Code 1868
P.O. Box 190010
North Charleston, SC 29419-9010

RE: Naval Industrial Reserve Ordnance Plant Superfund Site

Dear Mr. Sanders:

The Minnesota Pollution Control Agency (MPCA) staff has reviewed the following documents, dated August 1999:

1. Remedial Investigation for Operable Unit 3, Volume I of IV, Revision 1;
2. Supplemental Remedial Investigation Information Report;
3. A new Appendix A.6, Field Task Modification Requests, to Volume II of IV; and
4. New narrative for the first 12 pages of Appendix F, Data Validation, and a new Appendix G.8, Screening Evaluation for Exposures to Surface and Subsurface Soil (0 to 12 feet) Industrial Workers and Minor Construction Workers, to Volume IV of IV.

These documents are for Operable Unit 3 (OU3) of the Naval Industrial Reserve Ordnance Plant (NIROP) Superfund Site and were submitted pursuant to the Federal Facility Agreement, dated March 27, 1991, between the MPCA, the U.S. Environmental Protection Agency (U.S. EPA), and the U.S. Navy (Navy).

Our review was based on the following documents:

1. MPCA staff original OU3 RI modification letter dated January 11, 1999;
2. Mark Sladic's letter to Joel Sanders dated March 31, 1999 compiling the MPCA responses and the Navy's responses; and
3. MPCA staff letter to the Navy dated June 3, 1999, responding to the March 31, 1999 letter.

Remedial Investigation for Operable Unit 3, Volume I of IV, Revision 1

The MPCA staff hereby approves the Remedial Investigation for Operable Unit 3, Volume I of IV, Revision 1, as modified pursuant to Attachment I of this letter.

Supplemental Remedial Investigation Information Report

The MPCA staff hereby approves the Supplemental Remedial Investigation Information Report, as modified pursuant to Attachment II of this letter.

A New Appendix A.6, Field Task Modification Requests to Volume II of IV

The MPCA staff hereby approves Appendix A.6 without modification or comment.

New narrative for the first 12 pages of Appendix F, Data Validation, and a new Appendix G.8, Screening Evaluation for Exposures to Surface and Subsurface Soil (0 to 12 feet) Industrial Workers and Minor Construction Workers, to Volume IV of IV.

The MPCA staff hereby approves the new narrative for the first 12 pages of Appendix F, Data Validation, and the new Appendix G.8, Screening Evaluation for Exposures to Surface and Subsurface Soil (0 - 12 feet) Industrial Workers and Minor Construction Workers, to Volume IV of IV, as modified pursuant to Attachment III of this letter.

Because of a recent request by your office to accelerate the review of these reports, the MPCA staff is sending you our review responses at this time; however, the staff was not able to clarify certain review responses made by Helen Goeden, the MPCA risk assessor. Therefore, the MPCA staff may provide the Navy with a limited number of additional risk assessment comments hopefully in the near future.

If you have any questions regarding this letter, please contact David Douglas of my staff at (651) 296-7818.

Sincerely,



Michael Kanner
Section Manager
Site Remediation Section
Metro District

MK:csa

cc: Thomas Bloom, U.S. EPA (w/enclosures)
Mark Sladic, Tetra Tech NUS, Inc. (w/enclosures)

Attachment I

Modifications To Remedial Investigation For Operable Unit 3, Volume I of IV, Revision 1, Dated August 1999

1. Executive Summary, Nature and Extent of Contamination, General Modification

The Minnesota Pollution Control Agency (MPCA) staff requests that this discussion include mention of instances where detection limits frequently exceeded benchmarks used in the evaluations.

2. Executive Summary, Nature and Extent of Contamination, Bullet 5

The current wording could be misinterpreted. The MPCA staff requests that the Navy change Bullet 5 as follows:

The maximum ~~detected~~ concentrations of all detected chemicals in soil (0 - 12 feet depth) were less than the MPCA SRVs for industrial exposure with the exception of lead in one surface soil sample and chromium in one subsurface soil sample. Estimated cumulative excess cancer risks slightly exceeded MPCA target risk levels.

3. Executive Summary, Nature and Extent of Contamination, Bullets 6 and 8

In Bullet 8, the Navy indicates that the Navy believes that "potential [dense non-aqueous phase liquid] DNAPL" is present in ground water under the East Plating Room. Bullet 8 contradicts Bullet 6. Since DNAPL would have to be first released from the subsurface soil, the Navy found indirect evidence that the subsurface soil is contaminated by DNAPL. The MPCA staff requests that the Navy clear up this contradiction in this section and elsewhere in the report. Making a definitive statement about the presence of DNAPL is necessary before the Feasibility Study begins since this form of contamination is important to the types of remedies to be evaluated.

Bullet 6: The MPCA staff requests that the Navy change the narrative as follows, "[t]he maximum detected concentrations of all chemicals in soil (0 - 12 feet) were less than the MPCA SRVs for industrial exposures with the exception of lead in one surface soil sample and chromium in one subsurface sample."

4. Executive Summary, Nature and Extent of Contamination, Sanitary Sewer System

The Navy did not provide a plan for investigating the sanitary sewer system as requested in the MPCA staff letter to Joel Sanders dated June 3, 1999 (see item MPCA 1.8). At the end of this section, the Navy indicates that the sanitary sewer system likely leaks, but proposes to neither verify this assumption nor remediate a leaking sanitary sewer system if found.

From the isoconcentration lines shown in Figure 4-10, it does not appear that the location of the main line is related to the distribution of trichloroethylene (TCE) in the shallow aquifer.

However, it does appear that the distribution of TCE is related to the lateral sanitary line that is under the East and West Plating Rooms. It is our understanding that the soil borings SB01, SB02, and SB03 were taken through the floor of the East Plating Room. Both the 10,000 parts per billion (ppb) and the 1,000 ppb plumes appear to begin at or very near the East Plating Room.

It has been well established that the sanitary sewer system was a major disposal area for hazardous waste from NIROP for many years. Up until this report, the Navy has taken the position that there is no evidence that the sanitary sewer system leaks. The Navy may have taken this position, in part, because Tim Ruda of United Defense LP had attempted to determine if the sewer system leaked, but he studied the storm sewer system not the sanitary sewer system.

So far a basic premise of the OU3 RI has been that the sanitary sewer system is likely not leaking. This has led to a belief that a competent Superfund cap is present over OU3 that has led us to strongly consider institutional controls as being an important component of possible response actions for OU3.

In Section 5.3.1 Volatile Organic Compounds the Navy states:

Little, if any, leaching of contaminants from the unsaturated zone by infiltration is expected. As long as the building foundation remains in place and as long as leaks from the storm sewers and sanitary sewers are not significant, little water will pass through the unsaturated zone. Contaminants that have been retained in the unsaturated zone, therefore, are not expected to have a significant, continuing impact on ground water.

We agree with the above-cited narrative. However, a leaking sanitary sewer that has or had hazardous wastes in it could have not only released hazardous substances into the subsurface soils, but could be a source of ongoing releases (also see Item MPCA I.29 from Mark Sladic's letter of March 31, 1999). Ongoing leakage even in a "clean" sanitary sewer system could mobilize past releases from the system and provide a mechanism to contaminate ground water. The Navy now believes that "potential DNAPL" is present in the vicinity of the East Plating Room. Waste water from the leaking sanitary line under the East Plating Room could be mobilizing DNAPL in this area.

The MPCA staff requests that the Navy determine the condition of the lateral sanitary line that runs under the East and West Plating Rooms. If the Navy finds that this lateral in the area of the East and West Plating Room is leaking, the staff requests that the Navy repair this lateral sanitary line to prevent it from continuing to leak.

The finding of DNAPL under the East and West Plating Rooms is one of the most significant findings of the OU3 RI. The DNAPL mass under the plating rooms is likely the most significant subsurface source area for TCE at the NIROP facility. OU3 is composed of subsurface source areas under the building. In a telephone conversation between you and David Douglas of my staff in October 1999, you agreed that this was an important finding of the OU3 RI. This discussion resulted in your email message Mark Sladic dated October 15, 1999 requesting that the following remedial technology be added to Table 7-1: "Grouting lateral sewer lines between E-W Plating Shop" (grouting of the sanitary sewer lateral line under the east and west plating rooms).

You felt that televising the sanitary lateral was not necessary if the line were grouted. While grouting the sanitary lateral would appear to stop any ongoing leakage, the MPCA staff requests that the lateral line be evaluated to determine if hazardous wastes are still in the line and that these wastes be removed before the line is grouted.

5. Executive Summary, Human Health Risk Assessment

The MPCA staff requests that the Navy clearly state that the risk assessment was applied only to the top 12 feet of soil and worker scenarios, and therefore does not address deep subsurface contamination or other potential receptors. This evaluation indicated that there is not a need for controlling worker exposure to the top 12 feet of soil. Institutional controls (e.g., deed notification) regarding the deep subsurface contaminated soil, contaminated ground water, and limiting the property use to industrial use will need to be evaluated.

The information presented in this section is too ambiguous and the focus switches back and forth between soil and groundwater; therefore, the MPCA staff requests that the section narrative be changed as follows:

“HUMAN HEALTH RISK ASSESSMENT”

Chemicals of potential concern evaluated in the risk assessment are presented in Table ES-2 for soil and Table ES-3 for groundwater.

OU3 Soil Risk Assessment:

The human health risk assessment considered exposures to industrial workers, major-infrequent construction workers, and minor-frequent construction workers. Potential exposure pathways for all receptors included incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive and volatile compounds. Cancer risks and hazard indices were estimated following MPCA methodology. The following bullets summarize the results of the human health risk assessment for soil:

- *Potential Risks to Industrial Workers* - The potential health risks for the industrial worker were estimated by comparing surface soil (0 - 4 feet) concentrations to the MPCA Soil Reference Values (SRVs). A site-wide upper 95 percentile confidence limit of the mean was used as the exposure point concentration. An incremental Excess Lifetime Cancer Risk (ELCR) of 0.35×10^{-5} was calculated for industrial workers. The calculated ELCR is below both the U.S. Environmental Protection Agency's (U.S. EPA) acceptable ELCR range of 1×10^{-4} to 1×10^{-6} and the MPCA's acceptable chronic ELCR of 1×10^{-5} .

The noncancer endpoint specific hazard indices (HI) ranged from 0.001 to 0.053. The noncancer chemical specific hazard quotients (HQ) ranged from < 0.001 to 0.027. The calculated endpoint specific HIs were below both the U.S. EPA and MPCA acceptable HI of 1 and the chemical specific HQs were below the MPCA acceptable HQ of 0.2.

Since it is not known if deeper soils will be excavated at a later date, a screening risk evaluation (i.e., methodology is intended to overestimate the potential risk) utilizing the maximum detected concentration in soil within the top 12 feet was conducted. The screening HI (i.e., chemical specific HQs summed regardless of target endpoint) and the chemical specific HQs were below the acceptable HI and HQ values. The calculated ELCR, 2×10^{-5} , was within U.S. EPA's acceptable ELCR range of 1×10^{-4} to 1×10^{-6} but exceeded the MPCA acceptable ELCR is 1×10^{-5} . Carcinogenic PAHs (cPAHs) (0.8×10^{-5}), arsenic (0.6×10^{-5}) and hexavalent chromium (0.4×10^{-5}) were the major contributors to the ELCR. It should be noted that the maximum detected concentrations for these three contaminants occurred in different locations (different horizontally and vertically); arsenic concentrations exceeded background concentrations in only two percent of the 0 - 12 feet soil samples; and the chromium present was assumed to be in the more toxic hexavalent form.

- *Potential Risks to Major-Infrequent Construction Worker* - The potential health risks for the major-infrequent construction worker were estimated using Excel spreadsheets supplied by the MPCA staff. The maximum detected concentration in soil within the top 12 feet, regardless of spatial location, was utilized as the exposure point concentration. An incremental excess lifetime cancer risk (ELCR) of 2.1×10^{-6} was calculated. The calculated ELCR is within the U.S. EPA's acceptable ELCR range is 1×10^{-4} to 1×10^{-6} and but exceeds the MPCA's acceptable subchronic ELCR of 1×10^{-6} . The major contributors to the ELCR were cPAHs (0.7×10^{-6}), arsenic (0.5×10^{-6}), and hexavalent chromium (0.9×10^{-6}).

The calculated noncancer screening HI (summed regardless of target endpoint) was 2.9, which exceeded both the EPA and MPCA acceptable HI of 1. The major contributors to the cumulative HI were hexavalent chromium (1.35), arsenic (0.3), copper (0.2) and mercury (0.46). The cumulative HI was estimated by adding all chemical specific HQs together regardless of target endpoint. The target endpoint specific HIs do not exceed 1. The noncancer chemical specific hazard quotients (HQ) ranged from < 0.001 to 1.35. Only hexavalent chromium produced a HQ which exceeded the MPCA acceptable subchronic HQ of 1.

It should be noted that the maximum detected concentrations for the major contributing contaminants occurred in different locations (different horizontally and vertically), arsenic concentrations exceeded background concentrations in only two percent of the 0 - 12 feet soil samples, and chromium was assumed to be in the more toxic hexavalent form.

- *Potential Risks to the Minor-Frequent Construction Workers* - The potential health risks for the minor-frequent construction worker were estimated using Excel spreadsheets supplied by the MPCA staff. A site-wide upper 95 percentile confidence limit of the mean concentration within the top four feet of soil was used as the exposure point concentration. An incremental ELCR of 0.36×10^{-5} was calculated. The calculated ELCR is below both the U.S. EPA's acceptable ELCR range of 1×10^{-4} to 1×10^{-6} and the MPCA's acceptable chronic ELCR of 1×10^{-5} . The calculated screening noncancer HI (i.e., summed regardless of target endpoint) was 0.045. The calculated noncancer chemical specific HQ ranged from < 0.001 to 0.016. The calculated HI was below both the U.S. EPA and MPCA acceptable HI of 1 and the chemical specific HQs were below the MPCA acceptable HQ of 0.2.

Since it is not known if deeper soils will be excavated at a later date, a screening risk evaluation (i.e., methodology is intended to overestimate the potential risk) utilizing the maximum detected concentration in soil within the top 12 feet was conducted. The screening HI (0.646) and the chemical specific HQs (< 0.001 to 0.37) were below the acceptable HI and HQ values with the exception of hexavalent chromium. The calculated ELCR, 1.8×10^{-5} , was within U.S. EPA's acceptable ELCR range of 1×10^{-4} to 1×10^{-6} but exceeded the MPCA acceptable ELCR is 1×10^{-5} . Carcinogenic PAHs (cPAHs) (1×10^{-5}), arsenic (0.6×10^{-5}) and hexavalent chromium (0.2×10^{-5}) were the major contributors to the ELCR. It should be noted that the maximum detected concentrations for these three contaminants occurred in different locations (different horizontally and vertically). Arsenic concentrations exceeded background concentrations in only two percent of the 0 - 12 feet soil samples and the chromium present was assumed to be in the more toxic hexavalent form.

Conclusions for Soil:

Based on the results of the human health risk assessment no Contaminant of Potential Concerns (COPCs) were retained as Contaminant of Concerns (COCs) in surface soil. In the absence of chemical speciation information, chromium was retained as a COC in 0 – 12 foot subsurface soil in the Former East Plating Shop area.

The risk evaluation for the industrial worker indicates that under the industrial land use scenario, there is not a need for controls to limit exposure of workers to surface soil (0 - 4 feet). The risk evaluations for the activities that involved contact with soils beyond four feet suggest that the need for exposure controls should be evaluated. The need for institutional controls (e.g., zoning restrictions, deed notifications) to ensure that future property uses or activities that may result in higher exposures or exposures to different receptors not occur without proper oversight should also be evaluated in the Feasibility Study.

The human health risk assessment addressed potential direct contact with contaminated soil within the top 12 feet. Contamination also exists at depths beyond 12 feet (e.g., Sample SB07 containing 100 milligram/kilogram (mg/kg) TCE at 14 – 16 feet). The following criteria were utilized to determine COCs for soils located at depths greater than 12 feet:

[The MPCA staff requests that the Navy provide this information here.]

OU3 Ground Water Risk Assessment:

On-site ground water is not currently used as a potable water supply at NIROP Fridley. It may not be used in the future because a public water supply is available. Contaminated on-site ground water is a potential source of contamination for surface water in the Mississippi River. A screening evaluation of groundwater was performed following methodology and the Excel spreadsheet (DW1097.xls) supplied by MPCA staff. The following bullets summarize the results of the groundwater screening evaluation:

- *Upper Portion of the Unconfined Aquifer* - TCE, tetrachloroethene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1, 2-dichloroethene, trans-1,2-dichloroethene,

dichloromethane, 4-methylphenol, ethylbenzene, 1,1,1-trichloroethane, vinyl chloride, aluminum, beryllium, chromium, cobalt, cyanide, manganese, iron, selenium, thallium, and vanadium were present at concentrations exceeding screening levels and therefore were retained as COCs for the upper portion of the unconfined aquifer (see Table ES-5).

- *Lower Portion of the Unconfined Aquifer* - TCE, 1,1-dichloroethene, cis-1, 2-dichloroethene, vinyl chloride, aluminum, manganese, and iron were present at concentrations exceeding screening levels and therefore were retained as COCs for the lower portion of the unconfined aquifer (see Table ES-5).
- *Deep Aquifer* - Tetrachloroethene, TCE, and iron were present at concentrations exceeding screening levels and therefore were retained as COCs for the deep aquifer (see Table ES-5). Vinyl chloride is known to be a breakdown product of the above COCs. The detection limit for vinyl chloride in the deep aquifer exceeded the screening level. It is therefore recommended that vinyl chloride remain as a COC for the deep aquifer.”

6. Executive Summary, Human Health Risk Assessment, Decision Rules

The decision rules that appear on pages ES-10 and ES-11 have not been previously agreed to by the NIROP partnering team and are different from the decision rule that appears in Section 4.1 of the Final Work Plan for Operable Unit 3, dated June 30, 1997. It is our understanding that decision rules are to be identified in the RI Work Plan not at the end of the RI. The decision rules appear to be inconsistent with the discussion in Section 7.4, Initial Screening of Possible Alternative Response Actions, that identify possible alternative response actions that the Navy intends to further evaluate. The MPCA staff requests that the Navy explain why decision rules are being identified at this juncture.

As-stated-on-page 7-13-in paragraph 6 of Section 5.3 of Chapter 7 of the Working Draft of the Risk-Based Site Evaluation Manual, dated September 1998,

Institutional controls, as defined and applied in the state Superfund law, are measures that enhance or ensure the integrity of response actions, but are not themselves considered remedial actions. Institutional controls will not be used as the sole method of addressing a release, if there are remedial actions that are cost-effective and technically feasible. The MPCA will continue to have a preference for measures that eliminate or reduce the need for use [of] restrictions and long-term monitoring/maintenance activities.

The MPCA staff requests that the Navy modify this section accordingly. The MPCA staff requests that the Navy clear up inconsistencies between this section of the Executive Summary and Section 7.4 of the report. One acceptable way for the Navy to clear up these inconsistencies would be to reword the decision rules and associated statements by changing the narrative “the need for access restrictions, zoning restrictions, and deed notifications” to “the need for alternative response actions.” Then the Navy could add the institutional controls to some or all of the remedies in Table 7-1.

7. Executive Summary, OU2 RI Conclusions

Now that the Navy has completed the Supplemental Remedial Investigation Information Report, dated August 31, 1999, that updates the human health risk assessment for Operable Unit 2, it would be confusing to leave this section in the report. The human health risk assessment conclusions in this section are now outdated. Also, terms that appear in this section are outdated. The term "current land use" used in this section should be "industrial land use" and "future land use" should be "unrestricted land use." The Navy is not required to re-evaluate the unrestricted land use scenario in the Supplemental Remedial Investigation Information Report. Therefore, the MPCA staff requests that this section be removed from the executive summary and replaced by a narrative that briefly summarizes the old assessment and adds the evaluation and conclusions of the Supplemental Remedial Investigation Information Report.

8. Executive Summary, Initial Screening of Possible Alternative Response Actions

The statement that no active remedies are required appears to contradict discussion in the rest of the section and in Section 7.4 of the report. Perhaps the Navy is referring to active remedies for subsurface beneath the entire main NIROP building. The MPCA staff requests that the Navy re-write this narrative to clarify its intentions about proceeding with evaluating the remedies in Table 7-1.

9. Section 1.2.2, Facility History

The Navy did not provide additional information about the barrels discovered and removed during the OU2 Soil Remedial Investigation and the milling waste loading area as requested in the MPCA staff letter to Joel Sanders dated June 3, 1999 (see item MPCA 1.7 from Mark Sladic's letter of March 31, 1999).

The MPCA staff again asks the Navy to provide this information or document why it could not be acquired. However, the Navy did provide additional information concerning questions about the 1983 Initial Assessment Report in the letter from Joel Sanders to the MPCA staff, dated May 26, 1999. This letter is hereby appended to and made a part of this section of the OU3 RI Report.

10. Section, 2.3 General Procedures for Surface and Subsurface Investigation

Something is missing from the end of this sentence. Please rewrite the sentence as it was intended.

11. Section 2.3.3.1 Soil Sampling and Screening Procedures for Direct-Push Borings

The Navy did not change the narrative to incorporate the explanation given in Mark Sladic's letter of March 31, 1999 to the MPCA staff questions (see item MPCA 1.9). The staff requests that the explanation given in Mark Sladic's letter be added to the narrative in this section.

12. Section 2.3.6.4 Groundwater Sampling Order

The Final OU3 RI Report has not included narrative that discusses the limitations of methane sampling and analysis.

The MPCA staff requests that the Navy add the following narrative to this section pertaining to the methane sampling:

HCl or H₂SO₄ preservative (to prevent biodegradation of the methane) was not added to the samples, and the samples were not placed into vials that would have prevented the volatilization of methane prior to laboratory analysis. Although the sampling procedure adopted for this investigation was approved in the OU3 Work Plan, these factors may have resulted in the non-detection of methane in the ground water samples.

While methane is not considered a COC for the site, this correction takes on added significance in regard to the upcoming natural attenuation sampling in the Anoka County Park ground water investigation.

13. Section 4.1, Data Validation and Evaluation, First Paragraph, Last Sentence

The MPCA staff requests that the Navy change “Indiana Department of Environmental Management” to “Minnesota Pollution Control Agency.”

14. Section 4.1, Data Validation and Evaluation, Groundwater Exceedances for Volatile Organic Compounds (VOCs)

The second to last sentence is misleading since for some of the affected compounds, a large number of data points were nondetect with detection limits (DLs) exceeding levels of concern. The MPCA staff requests that the Navy identify in this section the affected compounds for which the number of nondetects associated with DLs were above levels of concern. For vinyl chloride for example, out of approximately 62 shallow groundwater samples 50 (80%) were nondetects with DLs exceeding the HRL; out of eight intermediate groundwater samples two (25%) were nondetects with DLs exceeding the HRL; and out of six deep groundwater samples six (100%) were nondetects with DLs exceeding the HRL.

15. Section 4.2.4 Presence of Non-Aqueous Phase Liquids in the Subsurface Soil

See Item three regarding the conclusions about the presence of DNAPL in OU3.

16. Section 4.3.4 Evaluation of Area of Concern (AOC) Groups, Sampling Scheme

Only 20 AOCs of the 70 AOCs are allocated to the seven groups. What was the basis for dropping the 50 AOCs from this analysis? For example, why are AOCs 43, 44, 51 and 52 in the East Plating Room and AOCs 39, 40, 41, 42, 50, and 68 in the West Plating Room neither assigned to Group two (degreasing) nor Group seven (plating) when both plating and degreasing operations were the two major operations in these rooms?

The MPCA staff requests that the Navy re-allocate all AOCs to groups and redo the analysis (see Item 11 below). The Navy may use the “miscellaneous” for a group for AOCs that cannot be assigned to any one of the seven groups; however, an explanation of why the AOC was assigned to this group is requested to be included. If there are AOCs that belong to more than one group, this should be noted.

Why did the Navy not evaluate AOC groups based on ground water and soil analytical results instead of just soil analytical results? As noted above, it appears that isoconcentration map known as Figure 4-10 strongly implicates the East Plating Room and/or West Plating Room and/or the sanitary sewer that underlies these rooms as a source or sources of ground water contamination. What is the source or sources for the ground water contamination in MS-31I and MS-33I shown in Figure 4-11? Are the latter two areas of greater than 10,000 ppb TCE associated with the shallow 10,000 ppm ground water plume downgradient of the East Plating Room? If not, why not? Why is the 140,000 ppb TCE sample result for GW-01 not shown in B-B’ cross section map? Why is soil boring data used for the B-B’ cross section map instead of ground water data from GW-01? The MPCA staff requests that the Navy re-evaluate the AOC groups based on ground water contamination.

17. Section 6.4.4 Risks to Industrial Workers

Third paragraph, page 6-21: reference to Table 6-7 should be Table 6-6. The soil concentrations presented in Appendix G do not represent the maximum soil concentrations. The risk presented in Appendix G does not correspond to the risk presented on page 6-21. However, the risks presented on page 6-21 do correspond with the risk calculated when one does utilize the maximum soil concentrations. This review can only assume that the wrong table for the screening industrial worker evaluation was included in Appendix G. The MPCA requests that this narrative be corrected accordingly.

Page 6-22, second sentence: The MPCA staff requests that the sentence be changed as follows, “In accordance with MPCA guidelines this sample was evaluated as hexavalent chromium in the screening risk assessment.”

18. Section 6.4.5 Major-Infrequent Workers

Note that the target HQ as well as the HI is 1 for subchronic exposure scenarios. Therefore, only hexavalent chromium exceeds the acceptable HQ. The noncancer target endpoints for the remaining metals discussed (i.e., arsenic, copper and mercury) are: arsenic - cardiovascular system, nervous system, and skin; copper - gastrointestinal system; and mercury - nervous system and reproductive system. Therefore, the target organ specific HI does not exceed 1. The MPCA staff requests that the Navy correct the narrative accordingly.

19. Risk Assessment, General

For the industrial worker scenario, the highest levels of subsurface soil contamination are benzo(a)pyrene in AOC 17 (wash rack sump - not assigned to any AOC groups of Section 4.3.4); arsenic in AOC 71(drywell in tank farm - not assigned to any AOC group), and chromium in AOC 44 (sump in East Plating Room - not assigned to any AOC group).

There are many polyaromatic hydrocarbons (PAHs) in AOC 17. Did the Navy use the benzo(a)pyrene equivalency analysis for carcinogenic PAHs to determine risk at this AOC?

For the major - infrequent worker scenario, the highest levels of contamination are chromium in AOCs 44; arsenic in AOC 71; copper in AOC 35 (paint spray drywell - Group 5); and mercury in AOC 13 (TCE tank - not assigned to any AOC group). For the minor-frequent worker scenario, the highest levels of contamination are benzo(a)pyrene in AOCs 17 and arsenic in AOC 71. For exposures to lead, the locations cited for highest level contamination are associated with AOCs 17 and 7 (TCE Tank - not assigned to any AOC group). The AOCs that have the highest exposure potential appear to be concentrated in a small number of AOCs, e.g., 7, 17, 44, and 71. All AOCs except AOC 7 are not in the AOC groups of Section 4.3.4

The MPCA staff requests that the Navy explain why AOCs 17, 44, and 71 are missing from the AOC groups of Section 4.3.4 and why these areas are not identified for remediation.

20. Section 6.4.8 Summary of Risk Characterization to Soil

The risk characterization was applied to contaminated soils within the top 12 feet. Contamination exists in the deeper subsurface soils (i.e., > 12 feet). On what basis were the deep soil COPCs eliminated?

22. Section 6.5 Analysis of Groundwater

This narrative implies that the ground water is not used as a public water supply because the Minneapolis Water Works (MWW) exists to supply water. This narrative is misleading because the city of Minneapolis developed plans to use ground water down gradient of NIROP as a backup water supply for Minneapolis, but decided not to install the water supply because of ground water contamination from NIROP. The MPCA staff requests that the Navy modify the narrative accordingly.

23. Section 6.6.2 Uncertainty in Selection of Chemicals of Potential Concern

Uncertainty Associated with Elevated Detection Limits

The text in this section focuses almost exclusively on soil. The MPCA staff requests that the Navy reference and discuss Tables 4-7 and 4-8 for soil. The discussion regarding inadequate detection limits needs to be expanded from Semi-Volatile Organic Compounds (SVOCs) to include VOCs. The text needs to be expanded to include uncertainties affecting the ground water evaluation (e.g., detection limits for cPAHs, vinyl chloride, etc. exceeded screening criteria). Tables 4-9 to 4-14 shall be referenced and discussed.

24. Figure 6-1

The MPCA staff requests that the Navy add a complete pathway to this figure. This pathway is the one that starts with surface and subsurface soils and ends with ingestion, inhalation (showers), and dermal contact (showers) of finished water from the (MWW) for adults and children. It has been established that TCE from NIROP has entered the MWW (Section VII.3 of

the Federal Facilities Agreement) and that finished water from the MWW has been contaminated by TCE, some of which was coming from NIROP (Section B.1.a of the Final Naval Industrial Reserve Ordnance Plant/FMC Corporation Public Health Assessment, dated June 10, 1999).

25. Section 7.1 Conclusions from the OU2 RI

Now that the Navy has completed the Supplemental Remedial Investigation Information Report, dated August 31, 1999, that updates the human health risk assessment for Operable Unit 2, it would be confusing to leave this section in the report. The human health risk assessment conclusions in this section are now outdated. Also, terms that appear in this section are outdated. The term "current land use" used in this section should be "industrial land use" and "future land use" should be "unrestricted land use." The Navy did not need to re-evaluate the unrestricted land use scenario in the Supplemental Remedial Investigation Information Report. Therefore, the MPCA staff requests that this section be removed from the report and replaced by a narrative that briefly summarizes the OU2 RI Report (RMT, 1993) and the Supplemental Remedial Investigation Information Report.

26. Section 7.2 Nature and Extent of Contamination

General Modification: The MPCA staff agrees with OU3 RI findings that over the study area, most COCs do not result wide-spread contamination that exceeds risk-based thresholds; however, the findings also show that some COCs that contribute to significant risk are associated with a comparatively small subset of AOCs. As noted in the first bullet, while the AOC groups identified do not show an increased potential to be disproportionately responsible for site contamination, this conclusion is misleading if left unchanged because only 20 of the 71 AOCs are represented in the groups. As indicated in Section 6.4.8, a small number of AOCs are disproportionately responsible for site contamination, e.g., AOCs 17, 71, etc. Also this conclusion ignores the evidence that the East and West Plating Rooms likely is a source area for TCE (see Figure 4-10) and chromium.

The narrative in the third bullet does not reflect that AOC 17 showed an increased potential to be disproportionately responsible for site contamination for PAHs. The MPCA staff requests that the conclusions in this section be rewritten to be consistent with the analysis of COCs in Sections 6.4.4 through 6.5.

A major finding of the OU3 RI is that the East Plating Room is likely the major OU3 source area for TCE in both the shallow and intermediate zones (see Figures 4-10 and 4-11). It is highly likely that the high levels of TCE shown in Figure 4-11 around MS-32I and MS-33I are related to the mass represented by the 10,000 ppb isoconcentration lines in Figure 4-10.

27. Section 7.3 Human Health Assessment

The MPCA staff requests that this section be rewritten as requested in Item 5 above.

The MPCA staff requests that the Navy change the summary bullets to include qualifying statements regarding the limits of the assessment. For example, whenever the risks for industrial or minor-frequent construction workers are discussed it should be clearly stated that the risk is based on exposure to surface soil (0 - 4 feet).

Bullet 6: Note subchronic target HQ is 1.

Bullet 7: On what basis were the COPCs for deep soils eliminated from further concern? They were not evaluated in the human health risk assessment. Was potential impact to groundwater considered?

Bullet 10: Vinyl chloride should be retained since the detection limits exceeded the screening criteria and it is known to be a breakdown product of the COCs for the deep aquifer.

28. Section 7.4 Initial Screening of Possible Alternative Response Actions

The MPCA staff requests that the Navy expand the discussion to address contaminated soils beyond the 12-foot depth.

First paragraph

The MPCA staff requests that the Navy delete the third sentence of the first paragraph since the staff cannot agree at this juncture that no “active remedies” are needed. OU3 consists of the “on-site subsurface source areas (saturated & unsaturated) beneath the NIROP manufacturing building - see Table 1 of the Site Management Plan, dated January 31, 1999). The Navy has discovered a subsurface DNAPL source area in the vicinity of the East and West Plating Rooms. Institutional controls should be considered as supplemental to remedies (see Item 6).

Institutional controls may be supplemental to most, if not all, remedies evaluated in the OU3 Feasibility Study (FS).

The MPCA staff requests that the Navy delete the fourth sentence of the first paragraph since it is premature to make sweeping statements about the outcome of the OU3 FS.

The MPCA staff requests that the Navy delete the last sentence of the first paragraph since initial screening is required by the FFA based on the findings of the OU3 RI, particularly for the subsurface DNAPL source areas. The FS is not done for the purpose of identifying remedies for releases that are not known to exist at the time of the FS. The OU3 RI has identified localized areas that represent unacceptable risks to human health, e.g., the subsurface DNAPL source areas. Also, the excavation and off-site disposal of any hazardous waste in drywells such as AOC 71 and sumps such as AOC 17 that are contributing to the high level of contaminants associated with these AOCs should be evaluated.

Second Paragraph

The MPCA staff requests that the Navy delete the fifth sentence of the second paragraph. While the OU1 ROD memorializes the selection of a remedy for OU1, this ROD does not preclude other remedies that have the potential to further improve ground water. Ironically, the Navy acknowledges this concept in the sixth sentence of this paragraph.

The MPCA staff requests that the Navy delete the second half of the last sentence of the second paragraph starting with “however” since remediating OU3 subsurface source areas such as the DNAPL source areas is done precisely to improve the quality of the ground water.

Third Paragraph

The MPCA staff requests that the Navy delete the first sentence of the third paragraph. Remediating the DNAPL source area under the building has the effect of reducing the risks associated with consuming ground water from the NIROP site.

The MPCA staff requests that the Navy delete the last sentence of the third paragraph. Institutional controls are not remedies and it is too early to know which of the proposed remedies would do the best job of remediating the DNAPL source areas.

Table 7-1

The MPCA staff agrees with the technologies retained for further evaluation as documented in Table 7-1.

Also, the MPCA staff evaluated remedies in the table entitled, “Alternatives Array for Remedial Action,” dated October 11, 1999 telefaxed to the staff by Mark Sladic. The MPCA staff requests that the Navy delete from this list the following: (1) the in-situ technologies identified as vitrification and soil washing; (2) all of the ex-situ technologies except excavation and disposal; and (3) all of the containment technologies (institutional controls are not remedies). Also, the MPCA staff requests that the Navy decide which description to use for remedies that are intended to be identical to those in Table 7-1 (either the description from Table 7-1 or the description from the “Alternatives Array for Remedial Action”) and modify Table 7-1 accordingly.

In an e-mail message from Joel Sanders to Mark Sladic dated October 15, 1999, the Navy added the following remedial technologies to Table 7-1: (Please note that the MPCA staff’s interpretation of the meaning of these remedies follows in parentheses. If the staff interpretation is incorrect, please correct it.) “Grouting lateral sewer lines between E-W Plating Shop” (grouting of the sanitary sewer lateral line under the East and West Plating Rooms); “Production Well closure” (sealing the two old production wells on the Navy’s property); “Certain dry well closures” (excavating and disposal of any wastes from any AOCs that need remediating); and “Extraction well near SW corner of building” (installation of a pumpout well in the southwest corner of the main NIROP building downgradient of the TCE plume from the East and West Plating Rooms). The MPCA staff agrees that these remedies should be added to Table 7-1.

Attachment II

Modifications To Supplemental Remedial Investigation Information Report, Dated August 1999

1. Section 2.1, Comparison to Industrial SRVs

The report states that the soil sampling results for the North 40 area after the removal action were compared to the Minnesota Pollution Control Agency (MPCA) SRVs.

It is not clear whether only residual sampling data from only the area of excavation was utilized in the comparison. If sample data from within the North 40 but outside of the excavation area exists, the MPCA staff requests that it be included in the evaluation.

2. Section 2.1 North 40 Area after Removal Action and Section 2.3 OU2 Excluding the North 40

The MPCA staff requests that a figure presenting the sampling locations accompany the report. The text explains that the maximum detected concentrations for TCE, cPAHs, and arsenic occur at different locations; however, without a figure depicting the locations this review can not determine the proximity of the sample locations.

3. Section 2.3 Major Infrequent Construction Worker Analysis

The MPCA staff requests that the report identifies that the subchronic target HI and HQ are 1.

4. Table 2-2 all Soils Excluding the North 40

The units are not listed in this table. The MPCA staff requests that units be included in the report. The staff assumed that the units were microgram/kilogram (ug/kg) as in Table 2-1.

5. Section 3.0 OU3 Groundwater

The ground water evaluation contained in this report is identical to the evaluation in the OU3 RI Report. The MPCA staff requests that the Navy clarify why the evaluation is repeated in this document. See Comments on the OU3 RI Report, Revision 1 regarding ground water.

6. Section 4.0 Summary/Conclusions

Bullet 5: The MPCA staff requests that the Navy note that the subchronic acceptable HQ is 1.

Bullet 6: The MPCA staff requests that the narrative be changed as follows, “No COCs were identified for soil in the North 40 area. Although the maximum detected concentration for trichloroethene results in a cancer risk of 1.5×10^{-6} and an HQ for the major infrequent construction worker that exceeds the MPCA acceptable subchronic level, . . .”

7. Section 4, Summary/Conclusions for the Groundwater Evaluation, Bullet 3

The MPCA staff requests that vinyl chloride be retained as a COC for the deep aquifer. See Comments on the OU3 RI Report, Revision 1 regarding ground water.

Attachment III

Modifications To New Narrative For The First 12 Pages Of Appendix F, Data Validation, And A New Appendix G.8, Screening Evaluation For Exposures To Surface And Subsurface Soil (0 - 12 feet) Industrial Workers And Minor Construction Workers, Volume IV of IV, Dated August 1999

Appendix F, Data Validation

1. All Audit Reports

The bias low (low spike recoveries) is noted. The Minnesota Pollution Control Agency (MPCA) staff requests that the Navy identify in the Executive Summary the percentage of metals data that is not qualified "J, UJ, R or UR."

2. Missing Discussion

The MPCA staff requests that the Navy clarify in the narrative whether or not all the data quality objectives were met.

3. Organics Analyses, First Paragraph

The di-n-butylphthalate is actually di-n-octylphthalate. Please change the text accordingly.

4. Table F-2

The MPCA staff requests that the Navy explain the presence of Bromacil.

5. Inorganic Analyses, Last Two Sentences, Page F-10

If data (e.g., antimony, selenium, and thallium data) is rejected due to poor spike recoveries or problems with calibration and/or calibration check standards, then it is not possible to determine that there is not a data gap for these metals. The MPCA staff requests that the Navy delete these two sentences or rewrite the sentences according to this MPCA staff response.

Appendix G.8

- 1. See modification regarding Section 6.4.4 in Attachment I.**