



Minnesota Pollution Control Agency

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

August 19, 2004

Mr. Douglas Hildre, P.E.
Environmental Control Manager
United Defense LP
Armament Systems Division
4800 East River Road
Minneapolis, MN 55421-1498

RE: Supplemental RCRA Facility Investigation Report Corrective Action Agreement

Dear Mr. Hildre:

The Minnesota Pollution Control Agency (MPCA) staff has reviewed the Supplemental RCRA Facility Investigation Report (Report), dated April 2004, which was submitted by United Defense, L.P. (UDLP) pursuant to the Corrective Action Agreement between the MPCA and UDLP, dated March 24, 2003.

The MPCA staff hereby modifies the Report pursuant to Attachment I to this letter. Comments to the Report can be found in Attachment II to this letter. UDLP does not need to respond to the comments.

The MPCA staff requests that UDLP install the new wells identified in Attachment I, sample the wells, analyze the samples, and report the results in a supplemental report that interprets the data from the new wells and modifies the Report based on the new data and the MPCA staff responses in Attachment I. The MPCA staff requests that UDLP submit a schedule for completing the supplemental report as soon as possible.

General Comments Regarding Monitored Natural Attenuation

The following comments and recommendations are placed in the cover letter to put the MPCA staff response to the Report in context with regard to the Report's discussion about Monitored Natural Attenuation (MNA).

The Report contains valuable information as a screening evaluation for the effect of natural attenuation on the contaminants associated with the chlorinated solvent release from the Former Paint Shop. It incorporates the ground water data collected from the temporary wells TW-10 and TW-11 installed specifically for the purpose of evaluating natural attenuation, coordinates this data with existing wells, and analyzes the geochemistry. This analysis shows that geochemical conditions in the ground water are conducive to the reductive dechlorination of the chlorinated aliphatics in the source area. This is consistent with the presence of the degradation products cis-1,2-dichloroethylene (cis-DCE) and vinyl chloride. From the data presented in the Report, natural attenuation appears to be effectively decreasing the contaminant mass contributing to the ground water plume at the site.

Based on our most recent meeting, the MPCA staff understands that the Report does not constitute a UDLR proposal for a Monitored Natural Attenuation Remedy for the Site, but instead is intended to provide important and meaningful data in developing prudent remediation options. The following comments are intended to assist in further evaluation of the fate of the contaminants at the Site.

1. The absence of ethene suggests that complete reductive dehalogenation of the contaminants is not occurring. Currently, the analysis of ground water demonstrates that reductive dehalogenation processes stop at the generation of vinyl chloride or cis-DCE. The microbial analysis of ground water during the oil injection project in Anoka County Park demonstrated that *Dehalococcoides ethenogenes* is absent. This organism is required for complete reductive dehalogenation of trichloroethylene (TCE) to ethene. The absence of ethene in the ground water brings into question the fate of the cis-DCE or vinyl chloride that is generated in the ground water at the Site.
2. Due to the close proximity, or even co-mingling, of the NIROP and the UDLR Former Paint Shop plumes, defining a downgradient edge of the actual Former Paint Shop plume is very difficult at best. The lack of distinct chemicals that would lend a characteristic "fingerprint" to the Former Paint Shop plume contributes to the lack of a clear distinction of the ground water that emanates from the two different sources. Thus, a key requirement in both the U.S. Environmental Protection Agency (U.S. EPA) and Minnesota natural attenuation guidance documents – establishing the "toe" of the plume beyond which a sentinel well could be placed - is difficult to address.
3. The amount of data in support of natural attenuation rates – both of the source reduction term and the degradation rate along the plume axis - is sparse, and corresponding confidence intervals for the data would undoubtedly be very large. This should be articulated in the Report. Additional data supplied by future sampling will add confidence to the rates estimated in the Report.

Mr. Douglas Hildre

Page 3

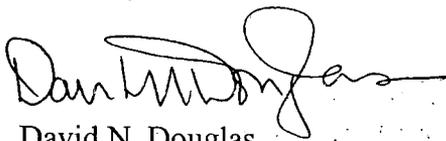
August 19, 2004

Recommendations Related to Reductive Dehalogenation

1. The evidence of reductive dehalogenation occurring in the ground water appears to indicate that the source of contamination may be attenuating at a significant rate without active intervention.
2. Continued monitoring of the ground water at the source and downgradient of the source will increase confidence in the reduction trends.
3. Maintain reliance on the downgradient pumpout system, in addition to in situ attenuation processes, as per recommendation in Report (conclusion section).

If you have any questions regarding this letter, please contact me at (651) 296-7818.

Sincerely,



David N. Douglas

Project Manager

Superfund Unit 2

Superfund Section

Majors and Remediation Division

DND:csa

Enclosure

cc: Thomas Smith, U.S. EPA

Dan Owens, US Navy

David Brayak, Tetra Tech NUS, Inc.

Attachment I
Modifications to the Report Entitled,
“Supplemental RCRA Facility Investigation,”
Dated April 2004

Figure 2-1, Monitoring Well and Cross Section Location Map

For purposes of observing the plume emanating from the Former Paint Shop area, the MPCA staff requests that UDLP draw Cross Section A-A' along the ground water flow path. Cross Section A-A' deviates from the flow path, interpreted from the measured equipotentials (see Figures 2-5 and 2-6) and includes some wells that are not downgradient of the spill. These include wells TW-10 and TW-11. The MPCA staff requests that a more meaningful cross section be constructed along the flow path from the Former Paint Shop and include wells MW-UD61-I, MW-UD66-I, MW-UD58-I, TW-12-I, MW-UD59-I, 7-IS and AT-3A or A-5B.

Figure 2-2, Geological Cross Section A-A'

See previous comment. When constructing the geologic cross section, the MPCA staff requests that UDLP differentiate fine sand from silty sand and that the facies relationship be interpreted from the drilling log data. There is a permeability difference between the two and the lower permeability of silty sand may affect ground water flow.

Figure 2-2, Geological Cross Section A-A'

The A' on the left side of the figure should be labeled A. Please correct.

Figure 2-2, Geological Cross Section B-B'

When constructing the geologic cross section, the MPCA staff requests that UDLP differentiate fine sand from silty sand and interpret the facies relationship from the drilling log data. There is a permeability difference between the two and the lower permeability of silty sand may affect ground water flow. There is a difference between wells MW-UD68-I (fine sand) and TW-10 (silty sand). The MPCA staff requests that the figure include a facies change in the cross section between the two lithologic logs.

Section 3.1, Analytical Results, page 19, paragraph 3

UDLP speculates about why Contaminants of Concern (COCs) have declined in well UD-62S. UDLP suggests that that the apparent decline may be due to seasonal variation from December 2002 to February 2003, presumably diluting the COC concentrations; however, COC concentrations increased in well UD-66I from 2002 to 2003. The MPCA staff believes that there are not enough data points to establish trends. The staff requests UDLP use a statistical method such as the Mann-Kendall non-parametric statistical test to evaluate trends when sufficient data is available to establish a trend.

Section 3.1, Analytical Results, page 20, paragraph 4

A statement is made that there is uncertainty regarding the vertical extent of contamination below 73 feet and that "...contamination in deeper ground water at the facility has not been identified to be a significant concern." The MPCA staff agrees with the uncertainty of the vertical nature of ground water contamination in the deep zone, but does not agree that deeper ground water contamination is not a concern. The MPCA staff has been concerned about the vertical extent of ground water contamination since the initial identification of the Former Paint Shop contamination. The investigation has demonstrated that the Former Paint Shop plume is sinking and that high levels of TCE exist in the intermediate zone (well MW-UD66-I). Uncertainty exists regarding the deep zone ground water contamination below the screened interval of well MW-66-I and MW-58-I. The data and this uncertainty warrant investigation of ground water in the deep zone downgradient of the Former Paint Shop area. Please see the recommendation for deep zone testing in modifications to the report conclusions.

Section 3.1, Analytical Results, page 20, paragraph 4

Perchloroethylene (PCE) has been released from the Former Paint Shop area. A review of 2003 Naval Industrial Reserve Ordnance Plant Annual Monitoring Report (NIROP AMR) ground water data in wells downgradient of the Former Paint Shop indicates that PCE exists in NIROP monitoring wells, particularly those that are screened in the deep zone. PCE is observed in NIROP monitoring wells 17-D, MS-41D, 8-D, 16-D and MS-47D at or above 8 micrograms per liter (ug/l). The data may be further justification that the Former Paint Shop plume has migrated into the deep aquifer zone and that the current monitoring of the plume has not defined the magnitude and extent of the UDLP Former Paint Shop plume particularly in the deep zone. Please see recommendation for deep zone testing in modifications to the report conclusions.

Section 3.2, Natural Attenuation Evaluation, page 24

The statement that aerobic biodegradation of COCs is occurring is confusing. PCE is not aerobically biodegradable. The MPCA staff requests that UDLP clarify this apparent discrepancy in the Report.

Section 3.2, Natural Attenuation Evaluation, page 24

While the presence of cis-DCE and vinyl chloride indicate the anaerobic biological degradation of TCE and PCE, the MPCA staff requests that UDLP include an analysis of ethene and ethane. The MPCA staff requests that UDLP include some reference to the implications of a lack of ethene in the ground water in the summary and conclusions sections.

Section 3.1, Analytical Results, page 21, paragraph 4

The MPCA staff does not agree that wells TW-10 and TW-11 are located on the downgradient flow path of ground water from the Former Paint Shop area. In addition, the MPCA staff notes that silty fine sand is located in the area in which these wells are located which is of a lower permeability than the surrounding fine sands. As such, the MPCA staff does not agree that these wells are useful in defining the downgradient Former Paint Shop plume

Figure 3-2, TCE Concentration Contour Map

The MPCA staff requests that UDLP modify the isoconcentration map to also contour the data for wells MW-UD58-I, TW-12I MW-UD59-I. It appears that the Former Paint Shop plume may merge with the NIROP plume between wells MW-UD58-I and TW-12I. The MPCA staff requests that this be reflected in the map. The higher TCE concentrations in wells MW-UD59-I, and possibly TW-12I, appear to be the NIROP plume as ground water flow occurs from the well MW-MS-33I area to these wells.

Figure 3-3, TCE Isoconcentration Contour Map Cross Section

The MPCA staff requests that UDLP redraw the isoconcentration map according to the MPCA staff response for Figure 2-1.

Figure 3-5, Cis 1,2 Dichloroethene Isoconcentration Contour Map Cross Section

The MPCA staff requests that UDLP redraw the isoconcentration map according to the MPCA staff response for Figure 2-1.

4.0 Conclusions, page 44, Conclusion 2

It appears from the data that the Former Paint Shop plume may merge with the NIROP plume in the well TW-12I and MW-MS33I area. It is likely that the plume has migrated farther than is indicated in this conclusion. Additional downgradient sampling and new cross sections have been requested to help determine the extent of the downgradient plume.

4.0 Conclusions, page 44, Conclusion 3

As noted in previous MPCA staff responses, it is unlikely that well TW-10 is located downgradient of the Former Paint Shop plume. In addition, the well is screened in silty sand that has a lower hydraulic conductivity than adjacent fine to medium sand. The material that well TW-10 is screened in is probably not a zone of preferential ground water flow due to a lower hydraulic conductivity. For these reasons, the MPCA staff believes that the well is probably not indicative of the Former Paint Shop plume. The MPCA staff requests that UDLP modify the conclusion accordingly.

4.0 Conclusions, page 44, Conclusion 4

The data indicates that reductive dechlorination is occurring in the Former Paint Shop plume. Also the data appears to indicate that although there are large reductions in TCE concentrations downgradient of the Former Paint Shop, a lower TCE-concentration Former Paint Shop plume eventually merges with the NIROP plume. As such, the toe of the Former Paint Shop plume is most likely not defined by the current existing data. Additional sampling is requested to determine the downgradient plume.

4.0 Conclusions, page 45, Conclusion 6

The MPCA staff does not agree that the nature and extent of COC contamination is adequately defined. Review of the Report data leads the MPCA staff to believe that the well TW-10 location is most likely not downgradient of the Former Paint Shop plume and that it is not a good location for a permanent monitoring well. In addition the lithology at well TW-10 indicates that silty sand exists there that is not expected to be a preferential pathway for ground water flow. Also the MPCA staff believes that the current data indicates that the Former Paint Shop plume may merge with the NIROP plume somewhere between wells MW-UD58-I and TW-12S. Also uncertainty exists regarding the extent and magnitude of deep zone ground water contamination from the Former Paint Shop area.

The MPCA staff requests that UDLP conduct exploratory borings in the area between wells MW-UD58-I and UST-MW2 to gather lithologic and intermediate and deep zone ground water contaminant information. The MPCA staff requests that UDLP collect water levels and ground water samples from temporary wells to determine if permanent monitoring wells should be located there. The MPCA staff requests that all cross sections and maps be updated to include this information. This data will be reviewed by the MPCA staff to determine if permanent wells should be located there. Until the issues cited above are resolved to the satisfaction of the MPCA staff, the staff cannot agree with this conclusion.

Section 4.0 Conclusions, page 45, Conclusion 7

The MPCA staff is not certain how much longer it will be before the contamination that is the subject of the Corrective Action Agreement will decrease to levels that would no longer need a remedy, regardless of what remedy is eventually determined to be acceptable to the MPCA staff. Should the NIROP ground water remedy be shut down before the UDLP ground water plume is adequately treated, the NIROP remedy would not be available to UDLP as a secondary remedy. The MPCA staff is not aware of any formal written agreement between the Navy and UDLP that would make the NIROP remedy available to UDLP as a secondary UDLP remedy now or in the future. Should UDLP and the Navy enter into such an agreement, the MPCA staff would be willing to consider the NIROP remedy as secondary remedy. For now, for the reasons cited above, the MPCA staff cannot accept that the NIROP ground water remedy is an adequate secondary remedy.

General Modification

The MPCA staff agrees that reductive dechlorination is occurring in the Former Paint Shop plume source area. UDLP has speculated that the carbon source that is an integral component of the reduction is petroleum hydrocarbons from a former underground tank leaks. UDLP has also reported that several former petroleum tanks were located upgradient of the Former Paint Shop. However, the nature, location, parameters, and parameter concentrations related to the hydrocarbon releases are not discussed in the Report. If the hydrocarbon release is an important part of the reductive dechlorination in the source area, the MPCA staff requests that UDLP show the locations of the former tanks on an appropriate figure.

Appendix D

It is unclear why page C11, which shows modeling of vinyl chloride to ethene, is included. This is not supported by any site data that would indicate that vinyl chloride is degrading to ethene. The MPCA staff requests that UDLP clarify this apparent discrepancy.

Attachment II
Comments to the Report Entitled,
“Supplemental RCRA Facility Investigation,”
Dated April 2004

4.0 Conclusions, page 44, Conclusion 5

The MPCA staff does not disagree that most of the TCE in wells UD 59-I and USGS-9 is from the NIROP plume. It is possible that most of the TCE found in well TW-12 is from the NIROP plume. However, the data seems to indicate that the Former Paint Shop plume merges with the NIROP plume and that some of the TCE is likely from the Former Paint Shop plume. The contribution of the Former Paint Shop plume is likely lower in concentration (although the deep contamination has not yet been defined) than that of the NIROP plume; however, there is a contribution. Additional downgradient sampling has been requested to better define the downgradient plume.