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NIROP FRIDLEY, MN
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MODIFICATION TO THE THIRD FIVE YEAR REVIEW REPORT WITH TRANSMITTAL
FRIDLEY MN
5/16/2008
MINNESOTA POLLUTION CONTROL AGENCY



May 16, 2008

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Howard M. Hickey
IR Program Manager
Naval Facilities Engineering Command, Midwest
201 Decatur Avenue, Building 1A
Great Lakes, IL 60088-2801

RE: Naval Industrial Reserve Ordnance Plant Superfund Site

Dear Mr. Hickey:

The Minnesota Pollution Control Agency (MPCA) staff has reviewed the document entitled, "Third Five-Year Review Report, Naval Industrial Reserve Ordnance Plant (NIROP) Fridley, Minnesota," (Report) dated April 2008, that was received April 10, 2008. The Report is for Operable Units 1, 2, and 3 of the Naval Industrial Reserve Ordnance Plant (NIROP) Superfund Site and was submitted pursuant to the Federal Facility Agreement, dated March 27, 1991, between the MPCA, the U.S. Environmental Protection Agency, and the U.S. Navy (Navy).

The MPCA staff hereby modifies the Report pursuant to Attachment I of this letter.

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

Sincerely,

A handwritten signature in black ink that reads "David N. Douglas".

David N. Douglas
Project Manager
Superfund and Emergency Response Section
Remediation Division

DND:ls

cc: Tom Smith, U.S. Environmental Protection Agency (w/attachment)
Mark Sladic, Tetra Tech NUS, Inc. (w/attachment)

Attachment I
Modifications to the report entitled,
“Third Five-Year Review Report,
Naval Industrial Reserve Ordnance Plant
(NIROP) Fridley, Minnesota,”
Dated April 2008

Section 3.0 Background, Second Paragraph, Page 3-1

The NIROP facility is now owned by Bowles, L.L.C. The MPCA staff requests that the Navy re-write this narrative accordingly.

Section 4.2.1, Last Paragraph, First Sentence, Page 4-2

Since the OU1 remedy discharge is not to the Metropolitan Council Environmental Services (MCES) system, this sentence is not relevant. The MPCA staff requests that the Navy re-write or delete this sentence from the Report to reflect the current discharge scenario.

Section 4.2.2. Phase II of OU1 Remedial Action, Second Paragraph, Third Sentence, Page 4-2

The MPCA staff requests that the Navy explain why the following remedial action objective cited in the ROD is absent “...hydraulic containment and recovery of all future migration of contaminated ground water from the NIROP and by recovery, to the extent feasible, of contamination downgradient of the NIROP.”

Section 4.2.2 Phase II of OU1 Remedial Action, Second Paragraph, Last Sentence, Page 4-2

The ROD also states that “[t]he USEPA has determined that MCLs are relevant and appropriate standards for ground water unless, under the circumstances at the site, more stringent standards must be applied to ensure protection of public health and the environment.” (See Section 10.2, Compliance with ARARs, last paragraph, page 43.) The MPCA staff requests that the Navy re-write this narrative accordingly.

Section 4.2.3 OU1 Performance Management, Third Paragraph, Third Sentence, Page 4-4

As explained in the past two Five-Year Reviews for OU1, the rationale for the surface water compliance wells is the MPCA’s requirements for protecting surface water which was also explained in the MPCA staff’s letter to the Navy, dated November 13, 2007. It is the MPCA staff’s understanding that there is no disagreement among the parties about this rationale. The MPCA staff requests that the Navy delete this sentence or re-write accordingly to the rationale cited in the above-cited letter.

Section 4.2.4 OU1 Operations and Maintenance, First Complete Paragraph, Last Sentence, Page 4-7

The objective of OU1 remedy to achieve "...hydraulic containment and recovery of all future migration of contaminated ground water from the NIROP and by recovery, to the extent feasible, of contamination downgradient of the NIROP" has not been met. This objective of the OU1 remedy is to protect public health and environment. The surface water TBCs, some of which are intended to protect the river as a public drinking water source, continue to be exceeded and to that extent, the OU1 remedy is not meeting the objective of protecting public health and the environment. The MPCA staff requests that the Navy delete this sentence or re-write accordingly to the rationale cited in this modification.

Section 7.0 Technical Assessment, Question A: Is the remedy functioning as intended by the decision documents?, OU1, Third Paragraph, Page 7-1

It is the MPCA staff's understanding that all parties agree that the OU1 remedy does not currently achieve the goal of hydraulic containment. However, the parties are not in full agreement on the cause of the failure. The U.S. Environmental Protection Agency (EPA) has articulated that the lack of containment is the result of a failure to operate the ground water extraction system as designed. The MPCA staff does not agree that hydraulic containment can be achieved solely through more efficient operation of the existing ground water extraction system alone.

The MPCA staff's position has been formed in part based on the U.S. Geological Survey report entitled, "Evaluation of the Contributing Areas for Recovery Wells at the Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota," dated 2007 by Hal Davis, as well as the discussion that Mr. Davis led at the January 2008 partnering meeting. Mr. Davis described how ground water is upwelling from the intermediate zone to the shallow zone after it moves under East River Road into Anoka County Park. This hydrogeologic condition was not identified when the ground water extraction system was designed. This report presents the capture zones of the ground water extraction wells in Figures 31 and 32. The capture zones present a "best case" area of hydraulic containment that was achieved with the current system operating near design capacity. Because the system has operated above 85 percent of design flow during the last five years for only thirteen months, the present area of capture is smaller than what is presented in Figures 31 and 32.

As shown by the ground water flow lines in Figure 31 in the report, hydraulic containment is not achieved on the northern edge of the plume and in the area of upwelling in Anoka County Park (ACP) on Figure 34. The MPCA staff believes the installation of additional ground water extraction wells needs to be evaluated to gain hydraulic containment of the ground water contaminant plume.

The MPCA staff requests that the Navy delete this paragraph or re-write accordingly to the rationale cited in this comment.

Section 7.0 Technical Assessment, Question A: Is the remedy functioning as intended by the decision documents?, OU1, Last Paragraph, Page 7-2

As the Navy is aware, the 2005 Response Action Work Plan outlines data quality objectives for evaluating the effectiveness of the capture well system. One objective in this regard is a 100 microgram per liter (ug/L) trichloroethylene (TCE) concentration for evaluating the effectiveness of the OU1 remedy. (See DQO Problem B, Effectiveness of the Capture Well System.) This means that 100 ug/L TCE is the ground water concentration used to evaluate the effectiveness of the capture system. A number of wells exceed 100 ug/L TCE just beyond the capture line of wells at or west of East River Road. These wells are: 18S at 480 ug/L (2006 data); MS-45S at 150 ug/L (2007 data); MS-46S at 1,600 ug/L (2006 data); 26-S at 290 ug/L (2007 data); MS-54I at 370 ug/L (2007 data); and 4-IS at 240 ug/L (2007 data). Also two compliance wells exceed 100 ug/L TCE: 43-S at 200 ug/L (2007 data) and 44-I at 340 ug/L (2007 data).

The extraction wells in the intermediate zone have experienced bypass since the 2001 upgrade to the OU1 remedy. Six years after the upgrade, ground water should have flowed past these points. Stable TCE concentrations in wells MS-54I, 27-S, MS-43S, MS-49S, and increasing concentrations in MS-43I indicate non-containment of the contaminant plume. Monitoring well 27-S is downgradient of MS-45I and MS-45S, which are, in turn, downgradient of MS-41S and 18-S, which are, in turn, downgradient of MS54-I. The flow line of these wells is characterized by wells that are all above 5 ug/L TCE.

Further evidence of the failure of the OU1 remedy to achieve containment of the contaminant plume extends back to 1999. This is shown in Figure 3 of Bay West's March 2008 Treatment System Report, dated April 14, 2008. For March 2008, the OU1 remedy pumped only 13.3 million gallons or 44 percent of the total design flow of 30 million gallons. Figure 4 of this report indicates that since September 2004, pumping rates of 90 percent of design capacity were achieved only in February 2007.

Step 5, State The Decision Rule, for Problem B states that "[i]f the capture well system is not effective at substantially preventing the flow of contaminated ground water from NIROP beyond the capture well system, evaluate potential system enhancements, source control, etc., as appropriate." The MPCA staff believes that it is time for the NIROP partnering team to evaluate system enhancements, source control, and source treatment and believes that the NIROP partnering team is beginning to address the issue of system enhancement.

Furthermore, the MPCA staff believes that sources of this contamination are under the main NIROP building. As noted in the 2007 AMR, "[i]nvestigation of ACP indicated that contamination west of East River Road (ERR) is not attributable to any contamination source located in ACP." The MPCA staff agrees with the statement in the 2007 AMR that states that "elevated TCE concentrations are predominantly a result of contaminant releases from the East Plating Shop areas...[and] additional unknown...TCE source areas may exist under the NIROP building..." The MPCA believes that the

sources causing ACP ground water contamination are under the main NIROP building. The presence of sources under the building is suggested by the ground water data in the following areas:

A. Former East Plating Shop

Nine monitoring wells are potentially in the East Plating Shop flow paths of influence in the intermediate zone: MS-32I, MS-34I, MS-35I, MS-56I, MS-55I, MS-36I, MS-44I, MS-43I and 16-IS. MS-35I has the highest TCE concentration of any well in the intermediate zone outside the NIROP building at 1200 ug/L (2007 data).

B. Southeast Area of Building

The TCE concentrations at MS-33I are the highest of any well at the site in 2007 at 6,300 ug/L. It is unlikely this contamination is coming from the former East Plating Shop unless the shop extended east of Broadway at NIROP. Rather it appears to be coming from somewhere southeast of the former East Plating Shop. The source is likely southwest or downgradient of United Defense L.P. (UDLP) monitoring well UD63-S which is 300 feet upgradient of MS-33I. AT-10 and monitoring well MS-54I are downgradient of this area.

C. South of Former West Plating Shop

This area is west of Broadway and south of the former West Plating Shop. This former machine shop area could be the source of TCE concentrations of 940 ug/L TCE found at MS-34I near East River Road in 2006.

As described at the May 6 and 7, 2008, NIROP partnering meeting, the MPCA believes that the parallel nature of the first order decay curves of MS-33I and MS-46S shows that there is at least one TCE source area upgradient of MS-33I. Also based on the first order decay rate in MS-35I, the MPCA staff does not anticipate that the TCE concentration at MS-46S will drop to 5 ug/L (the Maximum Contaminant Level) for 45 to 50 years. A passive soil gas survey may prove to be a useful tool to identify sources under the building. Bioremediation or some chemical treatment of any source areas found might be feasible remedies.

Section 7.0 Technical Assessment, Question A: Is the remedy functioning as intended by the decision documents?, OU1, Costs

The MPCA consulted the EPA document, entitled, "Comprehensive Five-Year Review Guidance, EPA 540-R-01-007 OSWER No. 93355-03B-P," dated June 2001, for what issues are to be addressed for answering this question. One of the issues to be addressed is the cost of the operating and maintaining the remedy compared to the original cost estimates. (See Section 4.1.2, third bullet, page 4-3 of the referenced document.) The MPCA staff also consulted the EPA guidance document entitled, "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents," dated July 30, 1999, OSWER 9200.1-23P EPA 540-R-98-031 PB98-963241.

The guidance defines "cost" as follows:

Cost. Are there significant changes in costs from estimates in the ROD, taking into account the recognized uncertainties associated with the hazard waste engineering process selected? (Feasibility Study cost estimates are expected to provide an accuracy of +50 percent to -30 percent.)

The present-worth cost estimate of the selected remedy cited in the ROD was \$3,700,000 (see Section 10.3, page 46 of the ROD) which included an estimated annual O&M cost of \$168,000 ("Draft Proposed Plan, Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota, March 1990," page 5-2, written by RMT, Inc.). The OU1 remedy has operated for approximately 15½ years. In 1995, two additional ground water extraction wells were added to the system and by 2001, five more extraction wells were added to the system along with an upgraded treatment system that changed the discharge from the MCES collection system to discharge to the Mississippi River.

Before the system was upgraded, the MPCA staff was informed that the Navy paid sewer charges to MCES of approximately \$900,000 per year or in 2001 dollars, the Navy paid approximately \$8,100,000 for sewer charges for the nine years that the treatment system discharged to the MCES sewer. According to Howard Hickey at the recent OU1 Five-Year Review site visit, the Navy paid approximately \$500,000 last year to operate the upgraded system, which likely included the \$150,000 for non-routine costs cited in this section of the Report, leaving approximately \$350,000 in routine O&M costs in today's dollars. Using \$350,000 per year in today's dollars as an estimate of the routine O&M costs, the Navy paid an estimated \$5,425,000 in 15.5 years. Add to this the sewer fees cited above, the Navy has paid approximately \$13,525,000 to operate the system in 15.5 years for an average of approximately \$872,580 per year. These costs do not include the costs of upgrading the system and the installation of the seven new wells.

Section 7.2 of the ROD guidance defines a fundamental change to a ROD as follows:

Fundamental changes involve an appreciable change or changes in the scope, performance, and / or cost or may be a number of significant changes that together have the effect of a fundamental change.

Clearly the costs of the OU1 remedy have exceeded the cost criteria cited in the ROD, particularly the O&M costs and exceeded the cost criteria cited in the EPA ROD guidance.

The MPCA staff requests that the Navy evaluate the OU1 remedy based on the O&M costs in this section of the Report and all future Five-Year Reviews. If the Navy disagrees with the MPCA staff's analysis cited above, the MPCA staff requests that the Navy indicate why MPCA staff's analysis is incorrect and why the MPCA staff has drawn the wrong conclusions about excessive costs of the remedy compared to those estimated in the ROD.

Section 7.0 Technical Assessment, Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?, First Paragraph, Page 7-3

The MPCA staff requests that the Navy clarify what it means by the “physical conditions of the OUs.”

Section 7.0 Technical Assessment, Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?, Exposure Assumptions, First Paragraph, Second Sentence, Page 7-3

The MPCA requests that the Navy identify the test results that indicate that “...COCs have not been detected at the MWW intake in excess of method detection limits.”

Section 7.0 Technical Assessment, Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?, Cleanup Levels – All OUs, First Paragraph, Second Sentence Page 7-4

The MPCA staff requests that the Navy indicate the surface water quality standards also protect the river as a drinking water source.

Section 7.0 Technical Assessment, Question C: Has any other information come to light that could call into question the protectiveness of the remedy?, First Paragraph, First Sentence, Page 7-5

As stated above, new information has come to light in the U.S. Geological Survey report entitled, “Evaluation of the Contributing Areas for Recovery Wells at the Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota,” dated 2007 by Hal Davis, as well as the discussion that Mr. Davis led at the January 2008 partnering meeting. At the meeting, Mr. Davis described how ground water is upwelling from the intermediate zone to the shallow zone after it moves under East River Road into Anoka County Park. This hydrogeologic condition was not identified when the ground water extraction system was designed. (See MPCA staff response to Question A on page 7-1.)

Section 7.0 Technical Assessment, Question C: Has any other information come to light that could call into question the protectiveness of the remedy?, Second Paragraph, Page 7-5

All chemicals cited in this paragraph, except the perfluorochemicals, have been identified to the MPCA staff as emerging Contaminants of Concern for Department of Defense sites such as NIROP. The MPCA staff requests that the Navy re-write the paragraph accordingly.

Section 8.0 Issues

At the NIROP partnering meeting of May 6 and 7, 2008, the MPCA staff believes that the parties to the FFA recognize that the OU1 remedy is not performing as envisioned by the ROD and that the parties agree that an evaluation of the system O&M must be made as a first step to determining what must be done for the OU1 remedy to achieve containment as required by the ROD. It is the MPCA staff's understanding that the parties have agreed that if O&M improvements do not result in containment of the contaminant plume, then the parties will proceed to evaluate other remedial actions to achieve containment of the contaminant plume.

As articulated above, the MPCA staff believes that the remedy has greatly exceeded the costs projected for the system as cited in the ROD. The MPCA staff believes that this is an issue that needs to be evaluated in this section of the Report as intended by the EPA Five-Year Review guidance.

Also as articulated above, the MPCA staff believes that the Navy needs to investigate and remediate source areas under the main NIROP building.

The MPCA staff requests that the Navy re-write this section accordingly.

Section 9.0 Recommendations and Follow-up Actions

The MPCA staff requests that the Navy add the following follow-up actions and a follow-up schedule to this section of the Report:

- Identify the follow-up actions and a follow-up schedule to improve the O&M of the OU1 remedy to attempt to contain the contaminant plume;
- Identify the follow-up actions and a follow-up schedule to provide daily information about the performance of the OU1 remedy in each monthly O&M report, including, but not limited to the daily pumping volumes of each extraction system well;
- Identify the follow-up actions and a follow-up schedule to reduce the excessive O&M costs of the OU1 remedy compared to the costs identified in the ROD;
- Identify the follow-up actions and a follow-up schedule if O&M improvements are not successful in achieving containment of the contaminant plume;
- Identify the follow-up actions and a follow-up schedule to complete an NIROP Site Exit Strategy, including, but not limited to the investigation and remediation of source areas under the main NIROP building; and
- Identify a set of recommendations, follow-up actions, and a follow-up schedule for Operable Units 2 and 3, if any.

Section 10.0 Protectiveness Statement

The MPCA staff believes that the remedy for Operable Units 2 and 3 remain protective of public health and the environment with the understanding that source areas exist under the main NIROP building that need to be investigated and remediated. These source areas likely belong to OU3. The MPCA staff requests that the Navy addresses this administrative issue when the Navy addresses the issue of investigating and remediating sources under the main NIROP building.

Regarding the protectiveness of OU1, as articulated in the recent NIROP partnering meeting of May 6 and 7, 2008, and in this letter, the MPCA staff concludes that the OU1 remedy is not fully protective of public health and the environment as envisioned by the ROD because the ground water downgradient of the OU1 remedy continues to exceed the ROD cleanup goal of 5 ug/L. Also the ground water contaminant plume downgradient of the OU1 remedy at the line of compliance wells in ACP continues to exceed the surface water ARARs/TBCs as cited in Table 4-3 of the Report. This situation was originally memorialized in the 1998 Five-Year Review and the contaminant plume continues to remain in noncompliance with the surface water ARARs/TBCs cited in Table 4-3.