

April 27, 2001

Mr. Venky Venkatesh  
CH2M Hill Constructors, Inc.  
990 North Point Tower  
1001 Lakeside Avenue  
Cleveland, OH 44114

Subject: Final Response to Comments on the Draft Work Plan for Field Application to Enhance *In-Situ* Bioremediation of Chlorinated Solvents via Vegetable Oil Injection at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, Minnesota

Dear Venky:

Please find enclosed two copies of the Final Response to Comments on the Draft Work Plan for Field Application to Enhance *In-Situ* Bioremediation of Chlorinated Solvents via Vegetable Oil Injection at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, Minnesota. These responses to comments were prepared by Parsons Engineering Science, Inc. for CH2M Hill Constructors, Inc.

If you have any questions regarding the draft work plan, please call me at (303) 764-8721.

Sincerely,

PARSONS ENGINEERING SCIENCE, INC.

Handwritten signature of Todd H. Wiedemeier, with the initials "for THW" written to the right.

Todd H. Wiedemeier  
Project Manager

Encl.

cc: Joel Sanders, Southern Division Naval Facilities Engineering Command  
Alan E. Dietrich, Naval Warfare Assessment Station  
R. W. John Aubert, Naval Warfare Assessment Station  
Mark Conti, Engineering Field Activity, Midwest  
Thomas R. Bloom, USEPA, Region 5  
David N. Douglas, Minnesota Pollution Control Agency  
Michael Convery, Minnesota Dept. of Health  
Mark Sladic, Tetra Tech NUS, Inc.  
Richard H. Kuhlthau, Techlaw  
Jeff Perry, Anoka County Parks  
Laura Schmidt, Anoka County Environmental Services

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO THOMAS BLOOM'S COMMENTS**

**SITE:** NIROP Fridley, Minnesota

**DOCUMENT:** Draft Work Plan for Field Application to Enhance In-Situ Bioremediation of Chlorinated Solvents via Vegetable Oil Injection at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, MN

**REVIEWER:** Thomas Bloom, U.S. EPA

**RESPONDENT:** Prepared by Parsons Engineering Science, Inc.; submitted 04/24/01

Item	Section	Page	Line	Comment	Response
1	General			The use of low flow sampling procedures is not planned for collecting groundwater samples during the pilot study. Low flow sampling techniques are currently used at the site in other sampling programs. Therefore, it appears that the use of low flow sampling during the pilot study would help to ensure comparability between groundwater quality data collected during the pilot study and data collected during other sampling programs conducted on site, and the use of low-flow sampling should be considered during the pilot study. However, the use of more conventional groundwater sampling techniques may be necessary to collect the data required to fully evaluate the enhanced bioremediation processes occurring on site (e.g., collect sample representative of a larger volume of the aquifer). Consequently, Parsons Engineering Science should evaluate carefully the use of low flow sampling and consider which sampling approach best meets the needs of the pilot study.	Concur. To ensure compatibility between groundwater quality data collected during the pilot study and data collected during other sampling programs conducted on site, low-flow sampling will be utilized when collecting groundwater quality data. The work plan will be revised accordingly.
2	7	6-1		The Work Plan (Section 7, page 6-1) indicates that "if the concentration of VC exceeds current	The work plan will be revised to indicate that if the concentration of vinyl chloride (VC) exceeds current

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO THOMAS BLOOM'S COMMENTS**

				regulatory limits at the 5 contingency monitoring wells then a contingency remedy will be implemented.” However, small exceedances of the regulatory limit may not require implementation of the contingency plan. Consequently, the Work Plan should be revised to indicate that if the concentration of vinyl chloride (VC) exceeds current regulatory limits at the contingency wells, the NIROP partnering team will be consulted to determine if the implementation of a contingency remedy is necessary.	regulatory limits plus existing ambient concentrations at the contingency wells, the NIROP partnering team will be consulted to determine if the implementation of a contingency remedy is necessary.
3	2.1.1	2-3		The Work Plan (Section 2.1.1, page 2-3) indicates that “a groundwater mound is present near well MW-46S in ACP,” and that “this mound effectively limits the groundwater flow (and contaminant flux) to the river.” This language appears to be taken from the 1999 Annual Monitoring Report (AMR). However, interpretation of the flow in Anoka County Park (ACP) has been revised in the February, 2001 Technical Memorandum for Additions to the 1999 AMR to indicate that the groundwater mound is a groundwater ridge and that the area in the vicinity of well MW-46S may be a stagnation zone. It has also been agreed that the AMR, as amended by the Technical Memorandum, would no longer indicate that the mound effectively limits the groundwater flow (and contaminant flux) to the river. To ensure that the current interpretation of the groundwater contours in ACP is accurately represented in the Work Plan, the above cited language from Section 2.1.1 of the Work Plan should be revised.	Concur. The work plan text and Figure 2.2 will be revised to reflect the interpretation of groundwater flow in Anoka County Park presented in the February 2001 Technical Memorandum for Additions to the 1999 AMR.

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO THOMAS BLOOM'S COMMENTS**

4	General	<p>Although originally indicated during previous meetings, the injection of a bromide tracer no longer appears to be planned during the pilot study. It is understood that there is reluctance to pursue the injection of a bromide tracer because Health Department officials indicate limited previous experience with such practices. While it may not be appropriate to delay the beginning of the pilot study by seeking to include the injection of a bromide tracer, further consideration should be given to injecting a tracer at some later point in the study. The groundwater flow and contaminant migration patterns in ACP have proven to be difficult to establish with certainty. Moreover, groundwater flow patterns will likely change with the changes in the extraction system that are now in progress. Consequently, the injection of a tracer may be very useful for verifying that monitoring wells, particularly the contingency wells, are properly placed and screened to intercept groundwater passing through the treatment zone.</p>	<p>We agree that a tracer such as bromide would be useful for determining groundwater flow patterns in the vicinity of the pilot test. Previous experience using bromide as a tracer has shown that high concentrations of bromide are necessary to afford detection at even short distances downgradient from the injection point. It is not known with any degree of certainty what effect the influence of high concentrations of bromide would have on the microbes that facilitate biodegradation of the chlorinated ethenes at the site. In lieu of using bromide, changes in contaminant concentrations and groundwater geochemistry should be sufficient to determine where vegetable oil is influencing the groundwater system and enhancing biodegradation.</p>

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO DAVID DOUGLAS' COMMENTS**

**SITE:** NIROP Fridley, Minnesota

**DOCUMENT:** Draft Work Plan for Field Application to Enhance In-Situ Bioremediation of Chlorinated Solvents via Vegetable Oil Injection at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, MN

**REVIEWER:** David Douglas, Minnesota Pollution Control Agency

**RESPONDENT:** Prepared by Parsons Engineering Science, Inc.; submitted 04/24/01

Item	Section	Page	Line	Comment	Response
1	General			The MPCA staff requests that the work plan be modified to reflect the data quality objectives (DQOs) agreed to in Charleston. The MPCA staff has not had time to review the statistical methods proposed by Tom Johnson of TtNUS. The MPCA staff approval of this document does not constitute approval of the proposed statistical methods or other modifications made subsequent to the Charleston meeting. A separate MPCA staff review of the latter modifications will be forthcoming.	The work plan will be revised to reflect the DQOs discussed in Charleston. The meeting minutes will be included as an Appendix.
2	2.1.1	2-3		The MPCA staff requests that the Navy remove the last sentence of this section. We have worked with the Navy to revise statements in the 1999 Annual Monitoring Report (AMR) and this sentence was removed from the 1999 AMR.  Please note that significant modifications are currently being made to the pumping remedy upgradient of the pilot test area. Several additional pumping wells will be brought on line prior to the implementation of the Pilot Test. These pumping changes may make changes to the ground water flow	Concur. The work plan text and Figure 2.2 will be revised to reflect the interpretation of groundwater flow in Anoka County Park presented in the February 2001 Technical Memorandum for Additions to the 1999 AMR. As discussed at the February 1, 2001 meeting held at NIROP, and discussed in Section 4.3.1 of the work plan, "The final [vegetable oil pilot test] well layout may vary from what is shown in Figure 2 as a result of information discovered during the field program. For example, the direction of groundwater flow may be modified when the new extraction wells are placed on-line in Spring 2001, and the well layout may need to be adjusted to

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO DAVID DOUGLAS' COMMENTS**

				regime in the study area and may reduce the flow of volatile organic compound (VOC) contaminated ground water into the study area. The MPCA staff requests that the impact of the new pumping wells are evaluated when the data from the pilot test is evaluated.	accommodate for these changes. The vegetable oil pilot testing system will not be installed until after the new extraction wells are brought online and the effect of these wells on the groundwater flow regime is evaluated.
3	2.2	2-8		The MPCA staff requests that the Navy remove "which may be prohibiting contaminant flux to the Mississippi River thereby allowing elevated concentrations to exist" from the partial sentence at the top of the page. We have worked with the Navy to revise statements in the 1999 AMR and the concept that the mound prevents movement of contaminated ground water to the river was removed.	Concur. The work plan text and Figure 2.2 will be revised to reflect the interpretation of groundwater flow in Anoka County Park presented in the February 2001 Technical Memorandum for Additions to the 1999 AMR.
4	4.1			The MPCA staff requests that the Navy clarify whether excess oil will be removed from the injection wells after the injection phase or just sampled.	Excess oil will not be removed from the wells.
5	Table 4.1			The MPCA staff requests that the Navy include sulfate in the pre-injection sampling analyte list and consider sampling for hydrogen in the pre-injection sampling event so that the post-injection concentrations can be compared to pre-existing conditions.	Table 4-1 will be revised to add Sulfate to the pre-injection sampling analyte list. Hydrogen analyses would be very beneficial and will be added to all applicable sampling events
6	4.2			The MPCA staff requests that prior to any field work mobilization, that the Navy give Paul Estuesta, MPCA On Site Inspector, a two-week advance notice. Paul can be reached at 651-296-7997. If this is not done, fieldwork may be delayed.	Concur. Paul Estuesta, MPCA On Site Inspector, will be given at least a two-week advance notice before field work. We understand that Paul can be reached at 651-296-7997.

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO DAVID DOUGLAS' COMMENTS**

7	4.2.1			Underground utilities clearances must be obtained through our Gopher State One Call and clearance must be documented.	Concur. Underground utilities clearances will be obtained through the Gopher State One Call program and clearance will be documented.
8	4.2.3.3			<b>Sampling Contingencies:</b> Any change in well locations must be approved by MPCA/EPA.	Concur. Any significant change in well locations will be approved by MPCA/EPA.
9	4.2.4			<b>Waste Handling:</b> This activity must be done in accordance with existing protocols (see Tim Ruda of UDLP).	Waste Handling will be conducted in accordance with existing protocols. Tim Ruda of UDLP will be contacted to ascertain existing protocols
10	4.3.2	4-7		<b>Drilling and Soil Sampling Procedures:</b> The MPCA staff requests that the Navy prepare detailed lithologic logs for each of the borings in the pilot test area and cross sections or a fence diagram constructed for the final report. The MPCA staff requests that the depth to water table be indicated on each log. Any geologic conditions which may impact the ability of the uniform delivery of vegetable oil to the desired aquifer interval or otherwise effect the success of the test and the interpretation of the results should be noted and discussed in the evaluation of the pilot test data.	Concur. Detailed lithologic logs for each of the borings in the pilot test area and cross sections or a fence diagram will be constructed for the final report. Furthermore, the depth to water table will be indicated on each log. Any geologic conditions which may impact the ability of the uniform delivery of vegetable oil to the desired aquifer interval or otherwise effect the success of the test and the interpretation of the results will be noted and discussed in the evaluation of the pilot test data.
11	4.3.3.5			<b>Injection well Development:</b> Under Minnesota Rule 4725 a licensed well driller must develop all new wells.	Concur. A licensed well driller will develop all new wells.
12	4.4.4			<b>Onsite Groundwater Parameter Measurement.</b> The MPCA staff requests that the Navy include oxygen and Eh as stability criteria for ground water sampling.	Concur. Dissolved oxygen and oxidation-reduction potential will be included as stability criteria for groundwater sampling.

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO DAVID DOUGLAS' COMMENTS**

13	4.4.2.2			<p><b>Preparation for Sampling:</b> The MPCA staff requests that the Navy documents all calibration procedures of field equipment and include information in final report.</p>	<p>Concur. All calibration procedures of field equipment will be recorded and included in the final report.</p>
14	4.4.4			<p><b>On-Site Ground water Parameter Measurements:</b> In accordance with MPCA Site Remediation Guidance Documents (Appendix 2 of 1998 Superfund and Voluntary Investigation and Cleanup Programs, Sampling Protocol Template for Monitoring Wells, Section 3.5), the MPCA staff requests that the Navy use stabilization parameters criteria listed below:</p> <p align="center">pH: +/- .1 units  Temperature: +/- .1 Degree C  Conductivity: +/- 5%  Turbidity: &lt;= 5 NTU.</p>	<p>Concur. The suggested stabilization parameters will be utilized.</p>
15	Appendix D			<p><b>Project Quantitation Limits, Laboratory Method Detection Limits and MCLs:</b> For the VOC analysis the compounds of major interest for the test and the detection limits for each compound are listed. The MPCA staff requests that the detection limits be low enough to meet the surface water quality standards.</p>	<p>As discussed during a conference call between TtNUS and MPCA on April 16, MPCA will evaluate the Veg Oil QAPP as a stand alone document. The review will be done in two phases. In Phase I, the review will focus on what is necessary for getting in the field, installing new wells, and collecting background/baseline samples. This review will be completed within two weeks. In Phase II,</p>

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO DAVID DOUGLAS' COMMENTS**

			<p>The QAPP indicates that samples will be sent to EnChem for analysis, although this is not the OU3 QAPP lab. In addition, Table 1.2 indicates that MDLs and PQLs for analytes are all To Be Determined, while the OU3 QAPP includes specific targets for each analyte. As verified by Venky Venkatesh to Mark Ferrey and me on April 11, 2001, based on a prior agreement at a NIROP partnering meeting that was intended to save the Navy time and money, the NIROP partnering team agreed that the OU3 QAPP would be used for this work plan. Review of the work plan by all MPCA staff reviewers indicates that the OU3 QAPP was not used for the work plan. Therefore, we are unable to approve the QAPP for the work plan because it is not consistent with the approved OU3 QAPP. The Navy may still use the OU3 QAPP for the study but it needs to reflect the parameters and DQOs of the vegetable oil pilot study.</p>	<p>the review will be a more extensive review of the QAPP. The resolution of these issues will be completed prior to the first progress sampling. The QAPP will be revised and re-issued at a later date based on comments from MPCA.</p>

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO CLIFF CASEY'S COMMENTS**

**SITE:** NIROP Fridley, Minnesota

**DOCUMENT:** Draft Work Plan for Field Application to Enhance In-Situ Bioremediation of Chlorinated Solvents via Vegetable Oil Injection at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, MN

**REVIEWER:** Cliff Casey (SOUTHNAVFACENGCOM)

**RESPONDENT:** Prepared by Parsons Engineering Science, Inc.; submitted 04/24/01

Item	Section	Page	Line	Comment	Response
1	General			The Workplan should specify the collection of sediment samples from each borehole associated with monitoring wells/extraction wells. These sediments should be submitted for analysis of bioavailable iron. Our expectation is that iron reducing conditions will form downgradient and will create an environment that is more favorable for degradation of both DCE and VC. Having these samples will allow us to evaluate the variability of the iron at the site and the probability that those conditions will occur and the longevity of that iron. Samples can be sent to Cliff Casey and he will get the analyses completed.	Concur. Soil samples will be collected from each borehole associated with monitoring wells/extraction wells. These soil samples will be submitted to Cliff Casey for analysis of bioavailable iron.
2	General			Discuss the expected geochemical conditions downgradient from the injection well that are expected to occur and mechanism for degradation of VC and DCE. In other words do you expect the system will be methanogenic and thus highly reducing for reduction of these lowly chlorinated HC's or do you expect the mechanism to be oxidation under iron reducing conditions.	It is anticipated that the area in the vicinity of the vegetable oil injection wells will become methanogenic. Because of the high biologically available iron (III) concentrations, it is anticipated that the system will become iron reducing at some distance downgradient from the vegetable oil injection point.

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO CLIFF CASEY'S COMMENTS**

3	General	Specify the use of either a feed grade oil that has both nitrogen and phosphorus or the addition of nitrogen and phosphorus to the food grade oil. If you do not plan to add these micro-nutrients, discuss why they are not needed.	Food grade vegetable oil will be injected. The use of this substrate versus feed-grade vegetable oil typically requires the "jumping through" of much fewer regulatory hurdles. To date enhanced bioremediation systems of any type do not appear to be limited by nitrogen or phosphorous.
4	General	A tracer such as bromide may be helpful in elucidating the degradation of the CHC's with vegetable oil. Include the tracer in the oil or address why it is not incorporated. I should think we can provide appropriate documentation to the local health agency to alleviate any concerns they may have with use of the oil. Note, our understanding of what is happening with this pilot scale project carries great significance as it relates to full scale implementation in Anoka County Park as well as the potential to expand this effort to include injection underneath NIROP plant itself.	We agree that a tracer such as bromide would be useful for determining groundwater flow patterns in the vicinity of the pilot test. Previous experience using bromide as a tracer has shown that high concentrations of bromide are necessary to afford detection at even short distances downgradient from the injection point. It is not known with any degree of certainty what effect the influence of high concentrations of bromide would have on the microbes that facilitate biodegradation of the chlorinated ethenes at the site. In lieu of using bromide, changes in contaminant concentrations and groundwater geochemistry should be sufficient to determine where vegetable oil is influencing the groundwater system and enhancing biodegradation.
5	General	Collect geophysical gamma logs for each well that is installed. This will assist in our interpretation of the hydraulic and potential retardation conditions at the site.	The use of gamma ray geophysical logs will be specified in the work plan.

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO CLIFF CASEY'S COMMENTS**

6	General	Collect isotherm sorption data. We are interested in the importance of sorption as well as matrix diffusion in CHC's at this site. Use sediments from each monitoring /injection well installed. With the idea that some wells with silts, some with clayey components and some with sand & gravel will be tested. This should give us some idea of variation at the site. We want to run some predictive analyses at other locations at NIROP as well as this location and need data to support assumptions associated with those data needs.	Isotherm sorption tests will be conducted on one sample from the screened interval of each newly installed well.
7	General	Provide a data sheet on the vegetable oil including composition, solubility and density.	A data sheet on vegetable oil including composition, solubility and density will be added to the work plan as an appendix.
8	General	Collect bulk density of sediments at each monitoring/injection well from the screened interval.	The bulk density of soils at each monitoring/injection well will be analyzed. Samples will be collected from the screened interval.
9	General	Analyze sediment at each monitoring/injection well for fraction of organic carbon from the screened interval.	The fraction of organic carbon at each monitoring/injection well will be analyzed. Samples will be collected from the screened interval.

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO TTNUS (MARK SLADIC) COMMENTS**

**SITE:** NIROP Fridley, Minnesota

**DOCUMENT:** Draft Work Plan for Field Application to Enhance In-Situ Bioremediation of Chlorinated Solvents via Vegetable Oil Injection at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, MN

**REVIEWER:** Mark Sladic (TTNUS)

**RESPONDENT:** Prepared by Parsons Engineering Science, Inc.; submitted 04/24/01

Item	Section	Page	Line	Comment	Response
1	General			Along non-technical lines, note that naming new wells beginning with MW-1 (at a site with over 150 existing wells) may be a problem in the future. We'd suggest one of two things to address this: 1.Name the new wells in the same sequence that is currently in use (i.e., the new wells should begin with MS-55S, then MS-56S, etc). 2. Use a specific designation to this project (e.g., VG-01, VG-02).	Concur. Newly installed wells will be labeled using the following convention:  Injection wells will be labeled VG-INJ-1, etc  Monitoring wells will be labeled VG-MW-1, etc.  Contingency wells will be labeled VG-CW-1, etc.

**PARSONS ENGINEERING SCIENCE, INC.  
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**REVIEWER:** Joel Sanders (SOUTHNAVFACENGCOM)

**RESPONDENT:** Prepared by Parsons Engineering Science, Inc.; submitted 04/24/01

Item	Section	Page	Line	Comment	Response
1	4.2.4			Section 4.2.4 Waste Handling Under normal conditions, purge water is stored in the poly tanks and then pumped into the equalization tank at Bldgs 52/53 via CH2MHILL/BAYWEST. Without knowing what minor quantities of vege oil may do to the air strippers, it is probably best to keep purge water w/ oil separate drum it.	Concur. Purge water containing vegetable oil will be contained in a separate container.
2	General			There is no discussion on the bioavailibility of Fe 3 in sediments being measured when taking split spoon samples. Cliff/Todd/Chapelle may want to include this information/sampling.	Soil samples will be collected from each borehole associated with monitoring wells/extraction wells. These soil samples will be submitted to Cliff Casey for analysis of bioavailable iron.
3	2			Section 2 - KEITH HENN - Please make sure that any revisions from the Tech Memo are corrected in section 2 i.e. mound = ridge, etc.	The work plan text and Figure 2.2 will be revised to reflect the interpretation of groundwater flow in Anoka County Park presented in the February 2001 Technical Memorandum for Additions to the 1999 AMR.

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RESPONSE TO JOEL SANDER'S COMMENTS**

4	General			<p>In the exec summary letter to Anoka, you mentioned Bromine injection to measure zone of influence but it is not mentioned in the Work plan unless I missed it.</p>	<p>We agree that a tracer such as bromide would be useful for determining groundwater flow patterns in the vicinity of the pilot test. Previous experience using bromide as a tracer has shown that high concentrations of bromide are necessary to afford detection at even short distances downgradient from the injection point. It is not known with any degree of certainty what effect the influence of high concentrations of bromide would have on the microbes that facilitate biodegradation of the chlorinated ethenes at the site. In lieu of using bromide, changes in contaminant concentrations and groundwater geochemistry should be sufficient to determine where vegetable oil is influencing the groundwater system and enhancing biodegradation.</p>
5	4.2.1, 4.2.3.1, 4.3.3.6, 4.3.3.1	Various		<p>Sections 4.2.1, 4.2.3.1, 4.3.3.6, 4.3.3.1 VENKY- Please help Mary out with these sections in regards to NIROP POC. NIROP POC does not really exist and field decisions/help will have to come mainly from the CH2MHILL Field/QC person (equivalent to Chris or John). The CH2MHILL Field/QC person can help with dealing w/ UDLP if necessary(Tim Ruda). I am not sure if UDLP would have any utility drawings in Anoka City Park. May have to check w/ Jeff Perry.</p>	<p>Section 4.2.1 will be revised as follows:</p> <p><b>Assign Accumulation Points.</b> Any purge fluids and decontamination rinsate/solvents or drill cuttings generated during site work will be properly contained as specified in the Waste Management Plan (CH2M Hill Constructors, Inc, 2000a). The location for the storage of containerized waste at NIROP will be coordinated through UDLP. Waste handling procedures are outlined in Section 4.2.4.</p> <p><b>Underground Utility Clearances.</b> Before any field work is conducted, each proposed intrusive sampling location at ACP will be checked for underground utilities. Underground utilities clearances will be obtained through the Gopher State One Call program and clearance will be documented. Any available utility maps</p>

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RESPONSE TO JOEL SANDER'S COMMENTS**

				<p>will be obtained from Anoka County Park and kept at the site where drilling work will be conducted.</p> <p><b>Badge and Vehicle Passes.</b> Personnel badges and vehicle passes will be issued as necessary for field personnel to access equipment staging and decontamination areas at NIROP.</p> <p>Section 4.2.3.1 will be revised as follows: Anticipated support needs are outlined in Sections 4.2.1 and 4.2.2. In the event that site access difficulties arise, Anoka County Park (ACP) personnel will be contacted to resolve the problem. The site manager and field team leader for CH2M Hill Constructors, Inc. will be responsible for notifying ACP personnel of access or coordination difficulties and working with ACP personnel to rectify any problems that may arise.</p> <p>First paragraph of Section 4.2.3.4 will be deleted.</p> <p>Second paragraph of Section 4.3.3.1 will be revised as follows: Water to be used in well installation and equipment cleaning will be obtained by the well drilling Subcontractor from an off-site source. The field scientist will make the final determination as to the suitability of water for these activities.</p> <p>Last sentence of first paragraph of Section 4.3.3.6 will be revised as follows: All rinsate will be collected in portable tanks or 55-gallon drums and will be staged in a designated location at NIROP. The location for the storage of containerized waste at NIROP will be</p>
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RESPONSE TO JOEL SANDER'S COMMENTS**

					<p>coordinated through UDLP.</p> <p>Second Paragraph of Section 4.3.3.6 will be revised as follows: Potable water to be used in equipment cleaning, decontamination, or grouting will be obtained from an offsite water source by the well drilling Subcontractor. Precautions will be taken to minimize any impact to the surrounding area that might result from decontamination operations.</p>
6	4.4.3.3 and 4			<p>Section 4.4.3.3 and 4 KEITH HENN - Can you make sure the purging method is consistent with the Lower flow sampling method we used in October 2000 or does it matter. I would think we would want to be consistent. FYI - well 46s had 18,000 ppb tce in 1999 and 12,000 ppb tce in Oct 2000 probably due to difference in sampling methods.</p>	<p>Concur. To ensure compatibility between groundwater quality data collected during the pilot study and data collected during other sampling programs conducted on site, low-flow sampling will be utilized when collecting groundwater quality data.</p>
7				<p>Contingency Plan - If we have to implement the contingency plan, does it take place at the new contingency wells or will additional wells, etc be needed. It was confusing when section 6 said "The final contingency remedy will be designed..."</p>	<p>If a contingency plan must be implemented, it will likely involve utilizing both the contingency wells installed under this program and additional wells installed for the contingency remedy.</p>
<b>Additional Comments from Joel Sanders</b>					
1				<p>Change contingency portion of work plan so that the team decides when to implement contingency.</p>	<p>As discussed during the Charleston DQO meeting, the work plan will be revised to indicate that if the concentration of vinyl chloride (VC) exceeds current regulatory limits plus existing ambient concentrations at the contingency wells, the NIROP partnering team will be consulted to determine if the implementation of a</p>

**PARSONS ENGINEERING SCIENCE, INC.  
RESPONSE TO JOEL SANDER'S COMMENTS**

					contingency remedy is necessary.
2				Make sure Parsons knows how to sample for VC (very low detection limits)	The QAPP will be revised to include the specific detection limits for the approved low detection limit method to be performed by the MPCA/EPA-approved laboratory (EnChem).