

May 16, 1994

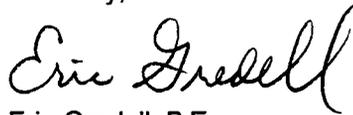
Commanding Officer  
SOUTHNAVFACENGCOM  
Attn: David Cabiness; Code 1862  
P.O. Box 190010  
North Charleston, SC 29419-9010

Re: Naval Industrial Reserve Ordnance Plant  
Fridley, Minnesota  
Contract No. N62472-90-C-1024  
RMT Project No. 2826.03

Dear David:

Enclosed, for your use, are two copies of the final notes from Technical Review Committee meeting #20 held at the Naval Industrial Reserve Ordnance Plant on April 21, 1994. Other copies of these notes have been distributed according to the attached Distribution List.

Sincerely,



Eric Gredell, P.E.  
Project Manager

jlg

Enclosures



RMT, Inc. — MADISON, WI  
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TRC MEETING #20**

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Commanding Officer 2  
SOUTHNAVFACENGCOM  
Attn: David Cabiness; Code 1862  
P.O. Box 190010  
North Charleston, SC 29419-9010

**Minutes of Meeting  
Technical Review Committee Meeting #20  
April 21, 1994**

**Naval Industrial Reserve Ordnance Plant  
Fridley, Minnesota**

Technical Review Committee (TRC) meeting #20 was held at the Naval Industrial Reserve Ordnance Plant (NIROP) in Fridley, Minnesota, on April 21, 1994. A copy of the agenda distributed at the meeting and an attendance list are attached.

**A. Introductions**

1. Chris Bartku opened the meeting on behalf of the Navy.
2. Attendees introduced themselves.

**B. Actions Since Last TRC Meeting**

1. Tom Bloom requested to receive a draft agenda prior to each TRC meeting, so the USEPA can add topics if necessary. He noted that the TRC meetings fulfill the requirement under the Federal Facility Agreement (FFA) for quarterly status meetings, as well as providing communication opportunities for the Navy.

He said that the USEPA is very dissatisfied with progress made related to groundwater remediation. No force majeure has caused the lack of progress. He said that 5 extraction wells were originally planned, and that all 5 wells should have been installed by this time.

He said the USEPA is proceeding with formal enforcement action to demonstrate to the public that the USEPA will require the Navy to take action on this project. Gary Eddy said that the MPCA supports the USEPA's position and agrees that enforcement action is warranted.

2. Charles Black said that the Navy has had difficulties in transferring the project management from Northern Division (NORTHDIV) to Southern Division (SOUTHDIV), particularly related to staffing shortages at SOUTHDIV. Another problem has been the lack of a contracting process that would allow efficient transition between project phases or milestones.

Charles Black said that the Navy has now resolved these problems. David Cabiness has been assigned as the Navy's Project Manager, and the NIROP is his only assigned site. In March 1994, SOUTHDIV finalized 2 new Remedial Action Contracts that will be available for use on all remedial action work managed through SOUTHDIV. Remedial Action Contracts are cost-reimbursable-type contracts that are expected to greatly reduce the contracting time requirements compared to the previous contracting process used for the NIROP. Morrison-Knudsen Company (M-K) is the Remedial Action Contractor (RAC) for the area that includes the NIROP. M-K will

function in the role of a general contractor for all future remedial action construction at the site.

3. David Cabiness said that all sewer use bills received to date from the Metropolitan Waste Control Commission (MWCC) have been paid, and the Navy has authorized funding for all anticipated bills through 1994. The bills are processed and sent to the MWCC by FMC, using funds provided to FMC by the Navy. Michael Flaherty confirmed that all MWCC bills have been paid.

Kerry Morrow said that previous delays in paying the bills were partly due to the 40% rate increase required by the MWCC, which required authorization of additional funds. Doug Hildre said that FMC was not notified in advance of the rate increase by the MWCC or the City of Fridley. He said that to avoid delays in payment of bills due to lengthy funding authorization procedures, advance notice of rate increases is needed. John Flora said that FMC received a notice of the rate increase when all other sewer users received a notice, i.e., the notices were attached to recent bills that included the increased rate. In addition, he said a public notice was issued and a public hearing was held. Michael Flaherty said the MWCC will attempt to provide some advance notice to the Navy and FMC of any future rate increases.

4. David Cabiness said that the Navy issued a letter last week to the City of Fridley, responding to the city's letter to the Navy in September 1993 regarding possible use of treated groundwater from the NIROP as a source of potable water for the city. John Flora said that the Navy's letter did not adequately respond to the questions included in the city's letter.

#### C. Actions for Next Quarter

1. Tom Bloom said he expects construction of the upgrade facilities for the groundwater extraction system to be completed in 1994. This includes tie-in of the discharge from the new well or wells into the existing pretreatment system. Preliminary design of the new groundwater treatment facility (GWTF) is also expected to be completed in 1994, with construction in 1995.

David Douglas said that the expectation for construction of the GWTF by 1995 does not mean that the USEPA or MPCA consider winter conditions to be a reason to delay construction of any remediation facilities over winter months. He said the MPCA considers the "construction season" to be open 12 months per year.

Charles Black said the Navy will make an assessment of construction feasibility at the time the work is ready for construction. He said the Navy does not expect that if the 1994 "construction season" is missed, then no construction will be required or attempted until the second quarter of 1995.

2. The 1993 Annual Monitoring Report for the groundwater extraction and pretreatment system is to be issued by May 13. A draft of the workplan for upgrading the groundwater extraction system (GWES) is to be sent to the Navy for review by June 15. A meeting is planned at RMT's office with the USEPA, the MPCA, and the Navy shortly after the workplan is issued to the USEPA and MPCA, to discuss the approach described in the workplan and to receive approval from the USEPA and MPCA for the planned improvements. Design of the upgraded facilities will not begin

until approval of the basic upgrading plan is received from the USEPA and MPCA.

3. Caroline Voelkers said the MPCA has not begun processing the NPDES permit application, but all information needed has been received from the Navy. Preliminary discharge limits will be available within 1 to 2 weeks. The draft permit will be finished in approximately 2 months; the public notice period will begin in approximately 2.5 months. The discharge limits will be equivalent to the state Recommended Allowable Limits, Health Risk Limits, or the state drinking water standards, whichever are more stringent. The lowest TCE concentration that can be required by the MPCA under existing regulations is 5 ppb. However, if warranted based on comments received during the public comment period for the permit, the MPCA would consider requiring lower discharge limits.
4. Doug Hildre said that FMC intends to submit an application to the MPCA by early May for renewal of the existing NPDES permit that addresses the 3 existing outfalls which receive process discharge and stormwater from the NIROP. He said that TCE has been detected in the discharge from the outfalls, but this is a result of TCE in the city water supply to the plant, not due to a source of TCE at the NIROP. Caroline Voelkers said the MPCA will incorporate the requirements for the planned groundwater discharge to the river in the renewal for the existing NPDES permit that will be requested by FMC in May, so there is a single permit that addresses the outfall that will receive the treated groundwater and the NIROP stormwater and process water discharge.
5. Caroline Voelkers said she will send a tentative schedule for the NPDES permit processing to David Cabiness.
6. David Cabiness noted that design of the longer-term GWTF cannot proceed until the final NPDES discharge limits and any other permit requirements are available, because the permit requirements may significantly affect the design.
7. David Cabiness said the Navy is preparing a response to the USEPA's letter regarding the overdue Alternatives Report for soil remediation. He said the Navy has a specific plan to bring the soil remediation project back into schedule compliance. He offered to discuss this plan in more detail with the USEPA representatives following the meeting.
8. David Douglas said the MPCA has nearly completed preparation of the soil cleanup levels. The final numbers will be available in the near future.
9. Chris Bartku said that the Alternatives Report and Feasibility Study Report for soil will be prepared through arrangements with the consulting firm of Brown & Root, under an existing NORTHDIV contract. SOUTHDIV is also attempting to make arrangements for RMT to prepare these reports and provide other assistance through the Record of Decision step for soil, as a subcontractor to Brown & Root. He said that M-K, the Navy's RAC for the NIROP, would not prepare documents such as the Alternatives Report and Feasibility Study Report; M-K would only be involved in construction-related work, not preparation of FS-related documents.

David Cabiness said the Navy expects to finalize contract arrangements with Brown & Root for preparation of the Alternatives Report within the next quarter. The schedule

for completing the Alternatives Report will be developed after the contract arrangements are finalized.

10. It was agreed that completion of the Operation and Maintenance (O&M) Plan for the groundwater remediation facilities should be coordinated among FMC, M-K, and the Navy. It was also agreed that further involvement of the Corps of Engineers was not required. FMC will provide comments on the draft O&M Plan that was issued several months ago to the Navy within approximately 3 weeks. These comments will address modifications to equipment and operating procedures implemented by FMC since they took on responsibility for operation and maintenance. Doug Hildre said that the O&M Plan should not be overly prescriptive in defining details for O&M, to allow some flexibility for making changes and adjustments without the need for obtaining formal approval of changes to the O&M Plan. Chris Bartku said that at this stage of the groundwater remediation program, the O&M requirements are dynamic, and the format of the O&M Plan must reflect this. Tom Bloom said that some minor deviations from details of the approved O&M Plan may be acceptable, for example, use of a different reporting form for maintenance records, provided that the same basic information is furnished. He said the Plan should include an up-to-date list of persons to be notified in advance of significant maintenance activities or other work on the facilities. Proposed changes to requirements of the approved Plan should be discussed with the USEPA in advance. Tom said the USEPA wants an O&M Plan that provides value to FMC in operating and maintaining the system. A "final" O&M Plan that meets the FFA requirements is needed to complete the administrative record. Tom said the "final" Plan should include information that is current as of the issue date; addenda would be issued to address subsequent changes to the facilities or O&M details.

Eric Gredell said that responses to USEPA comments on the O&M Plan - Rev. 0 have been prepared, and can be issued as soon as decisions are made regarding procedures for completing and issuing the "final" Plan. The responsibilities and tasks involved in preparing and issuing both volumes of the Plan need to be determined.

11. Eric Gredell described some modifications to the sampling and sample analysis procedures for the groundwater monitoring program and the treated groundwater discharge to the sanitary sewer that have been implemented as of January 1994. The Navy will send letters to the MPCA and the MWCC requesting formal approval of these modifications.
12. Doug Hildre said that there has been good correlation between photoionization detector readings of the air exhaust from the activated carbon vessel on the groundwater pretreatment system and the laboratory results from air samples collected at the same monitoring point. Based on this demonstrated correlation, FMC will send a letter to the MPCA requesting a modification to the current monthly sampling schedule for monitoring air emissions from the carbon vessel.

#### **D. RCRA Status**

1. Information was presented showing that VOC concentrations in the air emissions from the soil vapor extraction (SVE) system at former Hazardous Waste Storage Area "C" have dropped significantly since the SVE system started up in November 1993. The current operating plan requires operation of the SVE system for at least 2 years, at

which time a request can be filed to the MPCA for changes or shutdown of the system, if warranted by the cleanup conditions at that time.

**E. Community Relations**

1. The public repository for NIROP Superfund documents has been temporarily moved from the Fridley Public Library to the Defense Plant Representative Office at the NIROP. This was necessary because the library would not renew the rental agreement for space at the library. The Navy is investigating other possible locations, and will attempt to finalize the new repository location within 1 month. The Navy will issue a public notice announcing the new location for the repository after final arrangements have been made.

**F. General Topics**

1. John Flora said that in December 1980, the NIROP site was the #1 hazardous waste location in the United States. FMC cleaned up their portion of the site by 1984. However, the Navy is still waiting to clean up their portion of the site. He said that in 1981, the Twin Cities Army Ammunition Plant (TCAAP) was identified as a major hazardous waste site; groundwater treatment is now being done at TCAAP, and the treated groundwater is being provided to the cities of New Brighton and Fridley as a potable water supply. Mr. Flora said it is best to use groundwater from a cleanup program rather than waste it.

Mr. Flora said that the aquifers in the regional area around the NIROP are all interconnected, thus creating the potential for contamination of all aquifers due to contamination originating within any aquifer. He said that Fridley Well No. 13 pumps from the same aquifer as the currently operating NIROP extraction wells.

He said that the City of Minneapolis does not want any VOCs discharged to the river, as planned by the Navy. He said the recent drought years have caused water supply problems for several communities in the area. The regional aquifers are being rapidly depleted, and the groundwater resources in the area need to be protected and conserved. He said that at the TCAAP site, groundwater pumpout is expected to continue for 40 to 50 years. He said that at the NIROP, it would be appropriate to use liquid-phase activated carbon as the treatment process for groundwater instead of air stripping as planned. This would allow "non-detect" water to be provided to the City of Fridley as part of the long-term solution for the site.

Mr. Flora said that Fridley Well No. 13 is 230 feet deep, and the city operates water supply wells that pump from all aquifers in the area. Therefore, the city is familiar with potential O&M problems that can occur with groundwater wells and treatment equipment due to the local groundwater quality. He said that the city's goal is to receive "zero-detect" groundwater from the Navy, for the city's use as a supplemental drinking water supply. He said that if only chlorination is required for the water as provided by the Navy, the city and Navy may be able to work out an agreement regarding the treatment costs.

2. Chris Bartku said the Navy sent a letter to Senator Durenberger (refer to notes for TRC meeting #19) stating the Navy's position that the groundwater will be treated to

remove VOCs according to the Record of Decision (ROD), but the Navy will not treat the groundwater to meet all potable water quality standards. The Navy will provide groundwater to the city for its use in providing further treatment and use as a potable water supply. Charles Black said that the ROD specifies target cleanup goals for groundwater quality within the aquifer, not concentration requirements for the discharge of treated groundwater to the river. The state will define the specific limitations for the planned discharge to the river in a NPDES permit. It was also noted that iron and other inorganic constituents and indicator parameters in the extracted groundwater will cause operating and maintenance difficulties for the groundwater extraction and treatment equipment, as evidenced by the conditions encountered since startup of the GWES. These conditions and other factors related to optimization of remediation effectiveness are expected to produce a discontinuous groundwater flow, which would not provide a reliable source of potable water supply.

3. Gary Eddy said the MPCA supports beneficial reuse of remediated groundwater. However, he said the TCAAP situation does not apply to the NIROP. The Navy is only responsible for treatment of groundwater to the level required for discharge to the sanitary sewer or to the river. He said the Navy is not required to treat groundwater beyond this level, and the MPCA cannot require the Navy to provide an additional level of treatment to meet the city's goals. He said he takes exception to Mr. Flora's statement that "nothing has happened at the NIROP over the last 4 years." Tom Bloom also said that the city would be responsible for providing treatment beyond the level required by the USEPA and MPCA for the groundwater remediation project.
4. John Flora said that his definition of "no-detect" is "whatever can be measured." Charles Black said that achieving "no-detect" water quality is very different than the treatment needed to provide groundwater at a quality suitable for discharge to the river. Chris Bartku added that the ROD for groundwater has not changed, and that the groundwater will be treated only to the degree necessary for discharge to the river, according to the ROD.
5. David Douglas said the MPCA is willing to function as a facilitator for further discussions between the Navy and the city regarding the city's use of NIROP groundwater. He suggested that the city retain a consultant to provide assistance in evaluating all the technical issues related to use of NIROP groundwater. He said that the Navy and city can continue discussions on this matter while the MPCA proceeds with the NPDES permit processing.
6. Chris Bartku asked if the City of Fridley currently has problems with VOC contamination of the city's water supply system, and if the city was evaluating alternative supplies other than NIROP groundwater.

John Flora said the city's water supply system is contaminated. He said the question of whether the city is evaluating water supply alternatives other than NIROP groundwater is not a pertinent issue.

7. Charles Black asked how the question of providing "no-detect" water to the city would be resolved if the Navy and the city cannot reach an agreement. Tom Bloom said that the matter would be resolved by the USEPA and MPCA, under pertinent laws and regulations. Gary Eddy said that public comments would also be considered in defining the final treated water quality requirements.

8. Tom Bloom and David Douglas said the FFA is the legal document that drives the remedial action at the NIROP, not the Navy's difficulties in arranging appropriate and efficient contracting procedures. The FFA contains schedule requirements, including a deadline for the overdue Alternatives Report for soil. The Navy representatives agreed that the FFA is the primary document defining the remediation requirements. However, they noted that the Navy is also responsible to comply with other regulations and laws, such as the Federal Acquisition Regulations, that may impact the remediation schedules and actions to be taken.
9. Chris Bartku said the Government Accounting Office audit of the NIROP remedial action program has been completed.
10. Doug Hildre said that as of January 1, 1994, FMC Corporation is officially called "United Defense LP (Limited Partnership), Armament Systems Division." FMC Corporation retains 60% ownership of the new United Defense (U.D.) group. The changes at the NIROP are mostly administrative, and are not expected to affect the NIROP personnel or O&M of the groundwater facilities. Tom Bloom will check the procedures for officially changing the name of this Superfund site to reflect the new U.D. name.
11. Tim Ruda presented information and distributed a handout (attached) describing general O&M activities over the last year. Three well pump motors have been replaced after only about 1 year of operation, due to heat caused by excessive backpressure. The excessive backpressure has been caused by iron scale buildup in the pipelines and wells. The pitless adapters have been modified to provide air sparging into the complete piping system. The piping has been cleaned using chlorine at 25 to 100 mg/L dosage, followed by flushing and air sparging. However, only minor increases in flow rates were seen following the pipeline cleaning. The piping for well AT-3A is relatively clean, but the pipelines for the other wells are still relatively constricted.

Iron buildup also occurred on the air stripper packing. Acid cleaning of the packing in the column was not effective. The packing is now being removed for cleaning at the NIROP; another set of packing will be used for alternating with the packing currently being cleaned. U.D. is considering other maintenance approaches such as continuous chemical addition, different maintenance schedules, etc. E.H. Renner & Sons will be retained to provide assistance to prevent future premature burnout of pump motors.

The activated carbon vessel was last replaced about 5 months ago. Pressure regulating valves were installed in October 1993. The groundwater flow rates are expected to be relatively stable due to this improvement.

12. Doug Hildre suggested that shut-down of well AT-1A should be considered, based on the relatively low flow and contaminant concentrations produced from this well. Tom Bloom said that the well could be shut down if it is determined that it is not needed for plume capture, since this well was originally intended to function as a source-control well, not a plume containment and capture well. The Navy will evaluate this possibility.
13. Tom Bloom said the USEPA may consider a "carve-out" for soil remediation and use of a presumptive remedy, based on the good results with the SVE system at Area "C." It would still be necessary to follow Superfund procedures such as ARARs identification

and preparation of an Alternatives Report, although only one alternative (SVE) would need to be addressed in the Alternatives Report. Appropriate risk levels must also be addressed. Charles Black said this would be an attractive approach, provided final soil cleanup levels are defined. The Navy's new contract arrangements with M-K would facilitate the construction of the selected facilities.

14. A meeting was scheduled between the Navy and the City of Fridley, to be held on May 19 at 10:00 a.m. at the city's Municipal Center.
15. It was agreed that a telephone conference call will be held on the second and fourth Friday each month, to be initiated by the Navy. Participants will include SOUTHDIV, the USEPA, the MPCA, and RMT, with other participants on specific calls as appropriate. The calls will begin at 9:00 a.m. CDT, beginning on May 13.
16. A copy of the groundwater monitoring chemical data and time-plots for VOC concentrations since startup of the GWES was provided to the USEPA and MPCA.
17. The next TRC meeting was scheduled for **Thursday, June 23, 1994, at 10:00 a.m.** in the Defense Plant Representative Office (DPRO) at the NIROP Fridley. A draft agenda for the meeting will be sent for comments to the USEPA and MPCA by the Navy prior to the meeting.

NIROP FRIDLEY TRC MTG #20  
APRIL 21, 1994  
AGENDA

1. *Introduction*
2. *Actions since last meeting*

*Navy/RMT*

- *Annual Report*
- *GWES Upgrade*
- *Payment of MWCC Sewer Bills*
- *Response to City of Fridley's Letter*
- *Response to USEPA letter of late draft of Alternative Array Report for Soils Operating Unit*
- *RMT Contract has reached capacity*
- *Contract vehicle to install fifth extraction well and GWES plant upgrade*
- *Navy RPM dedicated to NIROP Fridley (Full Time)*
- *GAO Audit of DERA expenditures at Fridley complete, Report pending*
- *O&M Plan*

*United Defense*

- *Name Change of FMC to "United Defense, L.P. Armament Systems Division"*

United Defense (Cont.)

- *Maintenance & Monitoring Activities*
- *Public Repository moved to United Defense*

MPCA

- *NPDES Permit*

3. *Actions scheduled for next quarter*

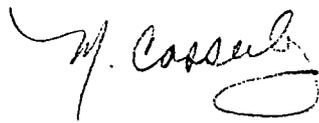
- *Award Soils FS*
- *Obtain NPDES Permit*

4. *Other issues/comments*

5. *Next TRC Meeting*

TECHNICAL REVIEW COMMITTEE (TRC) MEETING #20  
APRIL 21, 1994  
NIROP FRIDLEY, MINNESOTA

LIST OF ATTENDEES

<u>NAME</u>	<u>ORGANIZATION</u>	<u>ADDRESS/PHONE NUMBER</u>	<u>SIGNATURE</u>
Margaret Casserly	Black and Veatch	101 N. WABLER DRIVE CHICAGO, IL 60660	
Scott Erickson	City of Fridley	6431 Univ. Ave. Fridley, MN 55432	
Mark Koenig	COE		
Eugene Liu	COE		
Robert Hutchinson	County of Anoka		
Evan Drivas	DNR		
John Dresch	DPRO United Defense Minneapolis		
Major Gartin	DPRO United Defense Minneapolis		
Keith Lura	DPRO United Defense Minneapolis		

NAME	ORGANIZATION	ADDRESS/PHONE NUMBER	SIGNATURE
Oetterer	DPRO United Defense Minneapolis		
CDR Stephenson	DPRO United Defense Minneapolis		
Ken Barnes	EFA Midwest NAVFAC		
Joe Tomei	EFA Midwest NAVFAC		
Doug Hildre	United Defense	4600 E. River Road Mpls, MN. 55421 MAILSTOP 1375	<i>Doug Hildre</i>
Timothy Ruda	United Defense	4800 E. River Rd Mpls MN 55421	<i>Timothy R. Ruda</i>
<del>Adam Kramer</del> Larry Cole	Minneapolis Water Works	4300 Marshall St NE Mpls, MN 55421	<i>Larry Cole</i>
<del>John Betcher</del> Dave Douglas	MPCA	520 Lafayette Rd St. Paul MN 55155	<i>Ken Douglas</i>
<del>Dave Douglas</del> John Betcher	MPCA	520 Lafayette Rd. St. Paul, MN. 55155	<i>John Betcher</i>
Gary Eddy	MPCA	520 Lafayette Rd N. ST. Paul, Mn.	<i>Gary L. Eddy</i>

NAME	ORGANIZATION	ADDRESS/PHONE NUMBER	SIGNATURE
Jenness	MPCA		
Michael Flaherty	MWCC	MEARS PARK CTR 230 E 5th St. St. Paul, MN 55101 <sup>1633</sup> 612-772-7015	<i>Michael V. Flaherty</i>
Charles Smith	Naval Ordnance Center Pacific	Code 7083 Naval Weapons Station Seal Beach, CA 90803 (310)594-7695, 7181, 7167	<i>Charles A. Smith</i>
Jeff Allison	NAVSEA		
Steve Hoffman	NAVSEA	COMADSYSCOM WASH D.C.	<i>Steve Hoffman</i>
Morrow	NAVSEA	TECHNICAL REP. CTR 5001 E. RIVER RD MINNEAPOLIS, MN 55421-1400	<i>[Signature]</i>
Eric Gredell	RMT, Inc.	744 Heartland Trail Madison, WI 53717-1934 608-831-4444	<i>Eric Gredell</i>
Linda Hicken	RMT, Inc.	—	
Galen Kenoyer	RMT, Inc.	—	
Chris Bartku	SOUTHDIVNAVFAC		<i>[Signature]</i>
Black	SOUTHDIVNAVFAC	SOUTHNAVFAC ENGCAM CODE 186 PO Box 19010 N CHARLESTON, SC 29419-9010 803-743-0483	

NAME	ORGANIZATION	ADDRESS/PHONE NUMBER	SIGNATURE
David Cabiness	SOUTH DIV NAVFAC	SOUTH NAVFAC PO BOX 140010 N. CHARLESTON SC 29419-9000 (803) 743-0484	David Cabiness
Thomas Bloom	USEPA	47 W. Jackson Blvd. Chicago, IL 60604 (HSRM-6J)	Thomas Bloom
PAT MOSITES	REICC GREAT LAKES, IL	REICC, MNPLS 5001 EAST RIVER ROAD MINNEAPOLIS, MN 55421-1406 (612) 572-6438	P. Mosites
John FLOTT	CITY FRIDLEY	6951 VAN ALLEN AVE FRIDLEY, MN 55432 612 572 3552	J. Flott
Mark Ferry M	MPCA	520 Lafayette Rd. ST. PAUL, MN. 55110	M. Ferry

## NIROP Maintenance Activities

- \* Pump motors in AT2 & AT4 replaced 18 February.
- \* Monitoring Wells sampled 15-16 February
- \* Extraction wells sampled 25 February.
- \* Quarterly water level measurements performed 19 March
- \* Modifications made to air sparge all piping systems
- \* Complete system chlorinated
- \* Scrubber Packing Replaced

### Planned Activities      April-June 1994

- \* CLP procedure sampling of monitoring wells & Fridley 13 scheduled the week of 9 May.
- \* Investigate flowrate for protection of pumps.
- \* Carbon bed replacement pending analytical data.
- \* Look at alternative approaches to scrubber operation/cleaning.
- \* Quarterly water level measurements

NIROP Remediation System TCE(VOC) Data

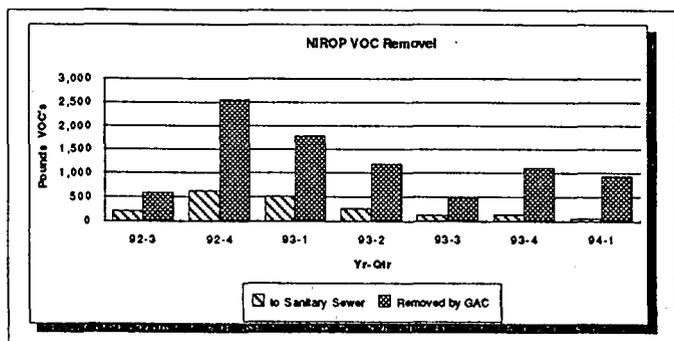
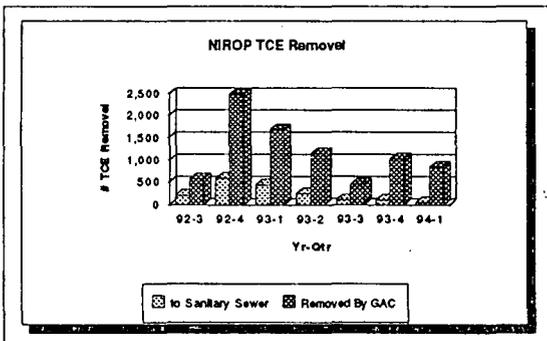
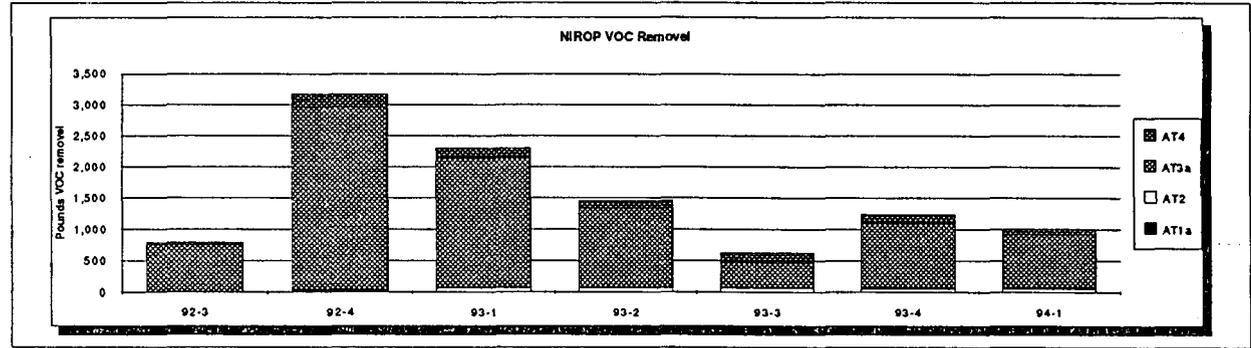
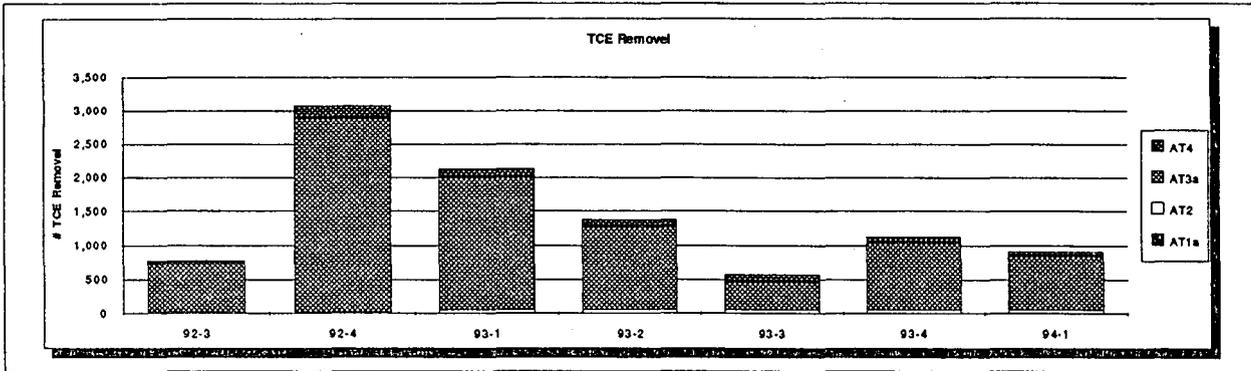
Yr/Qt	Analytical TCE mg/L					Flow Information in million gallons					# TCE Removed		# TCE Calculated		Accumulative		# TCE			
	AT1a	AT2	AT3a	AT4	Total	AT1a	AT2	AT3a	AT4	Total	to Sanitary Sewer	by Flow x Conc	Removed by GAC	Volatilized	Removed to S	AT1a	AT2	AT3a	AT4	
92-3	0.193	0.058	18.333	1.900	1.900	1.556	2.41	4.881	1.74	13.056	207	778	571	571	207	3	2	748	28	
92-4	0.235	0.118	11.887	2.400	1.288	4.8228	16.863	34.395	10.948	87.953	589	3,078	2,486	3057	796	6	14	2,871	184	
93-1	0.230	0.787	8.300	2.950	1.230	5.449	25.938	82.535	16.185	111.03	442	2,135	1,693	4731	1236	1	58	1,947	129	
93-2	0.150	1.400	8.200	2.400	0.848	6.756	30.943	88.217	21.461	146.3	249	1,390	1,141	5892	1487	2	58	1,224	108	
93-3	0.097	1.300	2.000	2.200	0.353	9.084	36.558	110.87	28.888	184.3	112	573	481	8353	1599	2	81	411	99	
93-4	0.120	1.700	4.700	1.700	0.340	13.783	40.138	138.48	32.482	223.78	112	1,138	1,028	7379	1710	5	51	1,004	79	
94-1	0.084	1.80	3.8	1.7	0.2	18.738	43.515	161.8	36.248	261.22	82	910	848	8227	1773	3	51	802	54	

Yr/Qt	Analytical VOC mg/L					Flow Information in million gallons					# VOC Removed		# VOC Calculated		Accumulative		# VOC			
	AT1a	AT2	AT3a	AT4	Total	AT1a	AT2	AT3a	AT4	Total	to Sanitary Sewer	by Flow x Conc	Removed by GAC	Volatilized	Removed to S	AT1a	AT2	AT3a	AT4	
92-3	0.738	0.175	18.420	2.364	1.971	1.556	2.41	4.881	1.74	13.056	215	797	583	583	215	10	4	750	34	
92-4	0.329	0.221	11.918	2.783	1.374	4.8228	16.863	34.395	10.948	87.953	629	3,182	2,553	3138	843	9	27	2,933	214	
93-1	0.270	0.972	8.687	3.410	1.458	5.449	25.938	82.535	16.185	111.03	524	2,304	1,780	4918	1387	1	74	2,080	149	
93-2	0.195	1.599	6.449	2.910	0.925	6.756	30.943	88.217	21.461	146.3	272	1,470	1,198	8114	1839	2	67	1,273	128	
93-3	0.128	1.477	2.078	3.046	0.401	9.084	36.558	110.87	28.888	184.3	127	636	509	6823	1768	2	69	427	137	
93-4	0.163	1.858	4.902	3.017	0.418	13.783	40.138	138.48	32.482	223.78	137	1,249	1,112	7735	1903	6	55	1,047	141	
94-1	0.114	2.093	4.08	2.795	0.235	18.738	43.515	161.8	36.248	261.22	73	1,013	940	8675	1978	5	59	881	88	

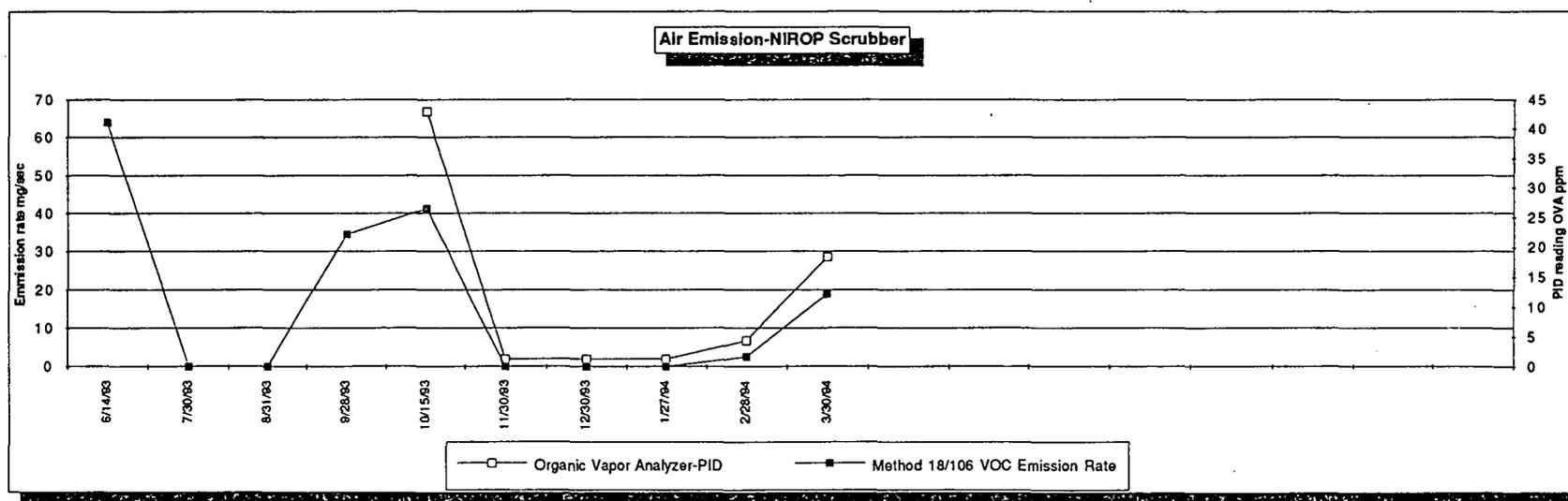
TCE(VOC) Removed = total flow x conc. x3785/454

TCE(VOC) Calculated = ((RW2 flow X conc.)+(RW3 flow X conc.)+(RW4 flow X conc.)+(RW5 flow X conc.)X3785)/454

TCE(VOC) Volatilized=TCE(VOC) Removed -TCE(VOC)Calculated



ALLOWABLE	6/14/93	7/30/93	8/31/93	9/28/93	10/15/93	11/30/93	12/30/93	1/27/94	2/28/94	3/30/94		
EMISSION RATE	Jun-93	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Jan-94	Feb-94	Mar-94		
CONTAMINANTS	EMISSION RATE (UG/SEC) (AER)	EMISSION RATE (UG/SEC) (ER)										
Benzene (71-43-2)	4,600	< 140	< 25	< 260	ND	ND	< 29	< 40	< 26	< 29	< 60	
Toluene (108-88-3)	429,800	< 210	< 16	< 18	ND	ND	< 20	< 27	< 18	< 20	< 12	
Xylene (mixed) (1330-20-7)	497,700	< 210	< 16	< 18	ND	ND	< 20	< 27	< 18	< 20	< 12	
Ethylbenzene (100-41-4)	497,700	< 210	< 16	< 18	ND	ND	< 20	< 27	< 18	< 20	< 12	
Chloroform (67-63-3)	1,600	< 180	< 240	< 250	ND	ND	< 276	< 380	< 250	< 270	< 580	
Dichlorodifluoromethane (75-71-8)	767,200	< 260	< 60	< 60	ND	ND	< 65	< 90	< 60	< 65	< 3	
1,1-Dichloroethane (75-34-3)	1,918,000	< 190	< 68	< 71	ND	ND	< 77	< 99	< 71	< 77	95	
1,2-Dichloroethane (107-06-2)	1,500	< 140	< 25	< 26	ND	ND	< 29	< 40	< 26	< 29	< 60	
1,1-Dichloroethylene (75-35-4)	800	< 340	< 120	< 66	ND	ND	< 72	< 99	< 66	< 72	< 150	
1,2-Dichloroethylene (540-59-0)	2,083,900	1200	< 65	< 390	1200	4000	< 73	< 100	< 67	1300	4000	
Dichlorofluoromethane (65-43-4)	105,300	< 220	< 52	< 52	ND	ND	< 56	< 77	< 52	< 56	< 200	
Methylene Chloride (75-09-02)	80,600	< 1800	< 250	< 400	ND	ND	< 430	< 590	< 400	< 430	< 900	
1,1,2,2-Tetrachloroethane (79-34-5)	700	< 280	< 100	< 110	ND	ND	< 120	< 160	< 110	< 120	< 240	
Tetrachloroethylene (127-18-4)	65,200	< 1300	< 95	< 100	ND	ND	< 110	< 160	< 100	< 110	< 220	
1,1,1-Trichloroethane (71-55-6)	3,835,800	< 47	< 84	< 89	ND	ND	< 96	< 130	< 89	< 96	< 200	
1,1,2-Trichloroethane (79-00-5)	2,400	< 220	< 84	< 88	ND	ND	< 95	< 130	< 88	< 95	< 200	
Trichloroethylene (79-01-6)	22,600	40000	< 83	< 1900	21000	22500	< 94	< 130	< 86	450	8000	
Trichlorofluoromethane (75-69-4)	2,685,100	< 280	< 69	< 68	ND	ND	< 74	< 100	< 68	< 74	2.4	
Vinyl Chloride (75-01-4)	460	< 140	< 31	< 31	ND	ND	< 34	< 47	< 31	< 34	3.9	
<b>Comments</b>												
Carbon Vessel replaced		6/23/93				10/26/93						
Organic Vapor Meter Reading East Stack						43	1	1	1	2.7	14.1	
Organic Vapor Meter Reading West Stack						24	1	1	1	4.1	14.5	
TVOC ppm PID unit sum total of 2 stacks						67	2	2	2	6.8	28.6	
Total VOC emission rate mg/sec		41.2	0	0	22.2	26.5	0	0	0	1.75	12.1013	



Concentrations of VOCs were determined by EPA method 18,106 for vinyl chloride